Health Mapping

Final Report

1 Executive Summary

1.1 INTRODUCTION

The Government of The Gambia (GOTG) has benefited from a credit from the International Development Agency (IDA) for the Participatory Health, Population and Nutrition Project (PHPNP) managed by the DoSH with World Bank support. The government has also received additional funding for the Health Services Development Project (HSDP) from the AfDB. Both projects will be administered concurrently, and will contribute to improving health infrastructure development of which was initiated under the IDA-financed National Health Development Project (NHDP).

In 1996, with AfDB financing, the DSH out-contracted a Health Sector Requirements Studies (HSRS), which, inter alia, estimated the cost of rehabilitating and equipping selected facilities, and proposed strategies for rehabilitating the existing maintenance system.

As part of its PHPNP preparations, the DoSH and IDA reviewed outputs of the HSRS and agreed to commission additional analyses in order to (i) conduct a comprehensive assessment of needs; (ii) finalise the civil-works component of the PHNP project in the context of that assessment; and (iii) prepare a national maintenance strategy in close co-ordination with AfDB. This report is the outcome of that process.

1.2 HEALTH PYRAMID, MPA, and NEEDS ASSESSMENT

1.2.1 Existing Service Delivery Structures

1.2.1.1 Analysis

Currently, the health pyramid offers 3 levels of service delivery. The *primary level* comprises a network of PHC and key villages, which serve as points of entry into the system. This system has had significant impact in establishing physical and socio-cultural access to health services.

The *secondary level* encompasses too many categories of facilities. It is not efficiently organised. Hierarchical linkages between different facilities and different categories of facilities are not precise: indeed, there are disparities even within facilities of the same category depending on locational and other factors. Such structural and operational ambiguities make efficient management of the system difficult.

The *third level* comprises 3 referral hospitals, which is satisfactory for a country of the size of The Gambia. A solid referral system is indispensable to the proper functioning of any health system. However, tertiary facilities must not monopolise resources to the detriment of lower level structures. Already, in The Gambia, the level consumes a disproportionate level of limited health resources. Completion of on-line projects such as Bwiam and Serrekunda will exacerbate this distortion.

Generally, the referral system among the 3 service levels is weak. Moreover, DHTs, which should play an important role in organising health services delivery, are weak with regard to human and material resources, and planning capacity.

1.2.1.2 Recommendations

The reorganisation of the primary level of the health system translated to significant gains. Consequently, this service delivery configuration should be preserved with parallel quantitative and qualitative expansion: that is, in number of PHC villages as well as better output quality particularly for difficult-to-access areas.

Structural revision of the health pyramid must lay particular emphasis on re-organising services at the secondary level. These are in dire need of rationalisation. Secondary level care must comprise a network of Minor Health Centres (MiHC), connected to and supported by referral facilities in the form of Major Health Centres (MaHCs).

The MiHC is viewed as the cornerstone of the health pyramid, and each disease or health problem must have a solution at this level. Its modest size facilitates integration of different programmes, referred as “the supermarket approach”. It has the comparative advantages of closer access to and better linkages with communities.

MaHC serves as back up to the MiHC. This facility should have the technical ability to deal with referral level problems, and should be organised accordingly. Its roles include inpatient care generally as well as outpatient care by physicians. Within divisional health systems, the MaHC should be developed with a view to building-up the efficiency and sustainability of peripheral units and community confidence also. For optimum efficiency, these must be located in divisional capitals, which are also the DHT sites.

Tertiary services are currently provided by Royal Victoria, Bansang and Farafenni hospitals. They are satisfactorily distributed over the national terrain. Prior to the commissioning of Farafenni hospital, both tertiary facilities were situated on the south bank: access to quality care north of the river proved arduous because of poor roads and weak telecommunications. With the current configuration, these hospitals can now properly assume the role of regional referral facilities and provide technical assistance to lower level structures as well as training for health facility staff.

Hospitals should be viewed as partners to lower level facilities in the delivery of health care, not competitors. High and intensive consumption of resources by hospitals can easily compromise the overall benefits of primary health care. Consequently, their linkages with and contribution to the rest of the health system should be clearly articulated: rather than being treated as special institutions with disproportionate access to resources, they should be carefully analysed to determine overall cost effectiveness of service delivery.

Generally, each level of the pyramid should provide only what cannot be provided at lower levels; and should not offer services available at higher levels. Thus, the scope of services provided at each level should be different and complementary to other levels of the pyramid.

1.2.2 Minimum Package of Activities

The range of services presently delivered at the primary level is adequate and provision should continue in the same way with gradual expansion.

There should be a clear divide between packages of services delivered by secondary level facilities, that is, MiHCs and MaHCs: minimum package by MiHCs and complementary package by MaHCs.

Preventive care is more easily and naturally done at the level of the MiHC. Here, hospitalisation should be limited to observation and to post-delivery surveillance of less than 48 hours only. All in-patient care is to be provided in MaHCs, which are generally better resourced, and also have more sophisticated medical facilities such as laboratories and surgical theatres.

Similarly, treatment of a case is considerably more expensive in hospitals than in either MiHCs or MaHCs. Thus, a hospital should not act as a primary care facility for the city where it is located. It should limit its services to specialised and severe cases that are referred from lower level facilities. This necessarily implies that MiHCs are required even in those settlements where hospitals, certainly, and possibly MaHCs also, are located.

If primary and referral care is not thus separated, demand from patients who could be cured at a lower level is certain to overwhelm higher-level facilities.

1.2.3 Access to Health Services

There is good distribution of health facilities by Division although some areas are better served than others. North Bank settlements, between NBD and CRD and between CRD and URD, have weak access to services due to poor distribution of facilities and transportation infrastructure also.

The western extreme of Western Division, including Banjul and Kanifing, is significantly different from the rest of the Division, and from the rest of the country. Without WD, number of inhabitants per Major Health Center varies from 1 per 70.000 to 1 per 185,000, with an average of 1:154,000. If NBDE and NBDW are considered together, the ratio is 1 to 185,000. This demographic profile of community served (1 / 70,000 to 1 / 185,000) is generally within range of global norms for provision of first-level referral facilities such as MaHCs.

Improvements proposed for the distribution of infrastructure are predicated on the following:

- Extension of PHC villages;
- For MiHCs, 1 facility per single or multiple districts depending on population and access;
- MiHC catchment population of 15,000 for rural areas and 20,000 for urban ones;
- 1 MaHC per Division backstopping a network of MiHCs;
- MaHC catchment population per facility of about 150,000;
- MaHC located in same city as DHT.

The target of 1 Integrated Health Center for every 15,000 inhabitants could be attained in one or in several phases, depending on funding. 10 years is considered a reasonable time period.

Numbers of total health delivery facilities proposed by category of facility and division are based primarily on population criteria and on the current distribution of existing facilities. Locations proposed should be reviewed by relevant units of the DoSH.

In should be highlighted that the ultimate location of MiHCs requires consideration of population criteria as well as analyses of present levels of activity in existing facilities, existing and proposed infrastructure, and presence of private/NGOP health facilities. Necessarily, this task should be based on a comprehensive and reliable health information system. Unfortunately, such a system does not exist in The Gambia. Key information –such as on hospitals-- is not included in the data collected by the DoSH. Consequently, the current system does not allow a reliable analysis of operations leading to definitive identification of facility locations.

While the GIS program prepared as part of the current study is a useful database with information on existing facilities, it is not a planning tool nor does it propose geographical locations for facilities. Its coverage is limited to assessing facilities, equipment and maintenance needs, in relation to the health pyramid and revised MPA. This constitutes an important first step toward the creation of a more sophisticated programmatic aid to decision-making.

1.2.4 Numbers of Beds Required

Assessment of numbers and distribution of beds required has been completed. The concept of "bed" was clarified and numbers of existing public beds assessed through a snap survey of facilities and a review of PER figures. Private facility beds are not systematically registered in DoSH documents and it was not possible to obtain reliable information on bed days, ALOS, etc.

For rationalised distribution of health services, it is proposed that North Bank Divisions East and West are united into one division, as is the case in sectors such as education and local government. Two scenarios for calculating numbers of beds are presented: the first is premised on an integrated NBD, the second on separate administrative divisions as currently exists in the health sector.

There is significant disparity among the administrative divisions. If the BAC/KMC area is excluded, and if NBE and NBW are grouped together (as proposed), national population to bed average computes at 1:1,300. A strategy for bringing this index in line with the WHO recommendation of 1:1000 and for reducing the gap among divisions is proposed.

For the purposes of determining MaHC and hospital catchment areas, each administrative district is liked to a referral facility.

A supplementary survey is indispensable for Banjul, Kanifing, and Kombo North. This region accommodates a significant proportion of the total population and is quite densely populated. Most of the private health facilities (with which public-private partnerships would be advantageous) are located in this area. It is in this region also that alternatives to hospitalisation such as the development of ambulatory care should be explored.

1.2.5 Staffing Requirements

Minimum required staffing for each type of facility was analysed. For PHC villages, permanent staff comprises Village Health Worker (VHW) and Traditional Birth Attendant (TBA). Such 2-person units are already operational in established PHC villages and form effective mechanisms for intervention at this level.

Personnel requirements for MiHCs are a function of activities therein. Staffing categories should include nurse, midwife or nurse/midwife, public health officer, technicians, and support staff. CHNs are also required to assist and supervise PHC village teams and generally stay in a key village. Technically, however, they form part of MiHC staff. It would be agreeable if a medical doctor would be available at this level. However, it may not be feasible and it is not necessary.

The complement of MaHC staff is and should be different from the Division Health Team personnel. Specific staffing composition and numbers will depend on number of beds.

For this analysis, MaHCs and hospitals are split into 3 groups as follows: small MaHCs – 20 to 40 beds; large MaHCs or small hospitals -- 110 to 150 beds; very large MaHCs or hospitals -- more than 200 beds. Staff composition for these facilities include MDs, midwife, technicians, registered nurses, state-enrolled nurses, assistant nurses, support and management staff, and administrative clerks.

There are no staffing norms for referral hospitals. Numbers and categories of professionals depend on types of specialised services offered at each establishment. However, the profile of staffing categories will be similar to that of MaHCs.

1.3 CIVIL WORKS AND INFRASTRUCTURE

1.3.1 Norms and Standards

Standards and norms such as materials, construction method and space required were prepared based on the revised minimum package of activity (MPA) associated with facilities at each level of the health delivery system. Design prototypes prepared include trekking stations, minor health centres, major health centres, and housing for key senior (medical) and junior (nursing) staff. As sizes and areas of specialisation vary widely, a prototype hospital is not feasible although space allocation and specifications for that category of facility mirror that for MaHCs.

On average, MaHCs structures have a total area of 300m^2 (for a 120-bed facility). Main blocks include general and surgical wards, theatre, laboratory, A&E, outpatients and administration in addition to utility structures such as kitchen, laundry, generator house, and incinerator. MiHC facilities comprise blocks for curative and mother and child care which total about 220m^2.

A standard 3-bedroom unit of area xxxm^2 is proposed for senior medical staff while built areas for junior staff housing varies between xx and xxm^2.

In general, 1 MaHC per division is required. However, because of poor access conditions in the NB, selected MaHC services are provided in MiHCs.

Sites that currently accommodate the old MaHCs are generally too small for activities included in the complementary package of activities. Soma, Serrekunda and Bwiam, projects now under construction or on the drawing table, are exceptions to this rule.

It is proposed that new MaHCs be constructed on green sites at Basse, Kuntaur, Kerewan and Brikama. The 3 on-going projects as well as upgrading works under the ambit of the ADB-funded HSDP should be linked to the new health pyramid and revised packages of activities, and structural modifications effected as required. Immediate action is obligatory. Implementation of required changes after projects are implemented would be very costly.

The existing MaHCs that are located in areas where green sites are to be developed, all existing MiHCs and dispensaries will be modified and rehabilitated for use as new MiHCs.

1.3.2 Implementation Programme

Implementation of civil works is based on a 10-year investment plan. In line with the National Health Policy (NHP), the plan proposed generally recommends strengthening and consolidation of the existing delivery system, prior to extension.

However, in order to ensure that health services do not decline to hazardous levels at any point during the strengthening or rehabilitation process, a limited amount of new construction is envisaged at commencement. Essentially, then, a 3-point intervention sequence is envisaged as follows: "strategic expansion – consolidation of existing - expansion of coverage." During the 1st year, construction of 10 MiHCs is proposed in those areas most poorly served with regard to morbidity and access. Construction is to be managed by the Gamworks Agency. These new facilities will help maintain current levels of services while existing facilities are upgraded to (new) MiHCs in years 2 to 5 of the programme. Subsequently, selective expansion of the MiHC network in years 5 to 10 will be programmed.

Within the programme, the MiHC is viewed as an important facility that strongly underpins the overall PHC system by decongesting over-burdened referral facilities. Consequently, they consume a significant proportion of the investment resources. Due attention and resources are also targeted to MaHCs, which have a role in preventing demand overload at the tertiary level.

1.4 EQUIPMENT

1.4.1 Existing Situation

The National Health Policy documents the government's intention of upgrading health equipment as a means of strengthening quality of care and improving motivation of staff. If this is a policy objective then the existing situation is quite worrisome.

As underlined in the HSRS, poor quality and low quantity of equipment plus a conspicuous absence of proper planning has rendered peripheral health structures quite incapable of performing assigned functions.

1.4.2 Review of Equipment Lists

Standard lists for each category of facility

The essence of standard equipment lists is for anticipating means of diagnosis and treatment coherent with activities offered by the various categories of health facilities. In this process, international standards, mainly WHO, and the equipment life cycle cost are taken into account.

Two lists of equipment, the AfDB Appraisal Report, October 1997, and Annex 5.3.1.1 to HSRS – Phase II report, were found and reviewed. The list developed in the present study was specifically designed to support activities specified in the minimum and complementary packages of activities. The equipment profile proposed is also based on the morbidity and mortality structure. Such indicators express problem areas on which interventions will be targeted as a matter of priority:

- Family Health, including Maternal and Child Health, Family Planning, Nutrition and Immunisation
- Prevention and Control of Endemic Diseases
- Health Promotion through IEC protocols and other preventive health measures to address non-communicable diseases.

As specified in the NHDP, equipment should also contribute to strengthening institutional capacity within the health sector in the 1994–2000 policy period.

1.4.3 Equipment Investment Program

To assist the DoSH prepare 5-year and 10-year preliminary investment programmes, the following were determined:

- Equipment life span;
- Estimated cost of replacement at the end of the life cycle for every type of health facility;
- Estimated budget for regular replacement of materials.

In the absence of a quantitative and qualitative inventory of existing equipment, the replacement budget was based on a stipulation that all existing equipment require replacement. A more accurate estimation will be possible only when a comprehensive inventory of existing equipment is available.

With an initial equipment investment of $10,479 dollars in year 1, total cost of replacement in a MiHC will be $439 in year 6, $2,240 in year 8, and $8,039 in year 11. For MaHCs, an initial investment of $ 258,769 translates to replacement costs of $50,980 in year 6, $101,210 in year 8, and $157,559 in year 11.

Government's investment in medical equipment should factor in investments made by or anticipated from various donors. Currently, formal commitments have been secured from some donors for the equipping of selected facilities.

1.5 TRANSPORT and VEHICLE MAINTENANCE

1.5.1 Norms and Standards

Transport and vehicles are utilised by various categories of facilities including hospitals, MaHCs and MiHCs, DHTs as well as such units as Medical Headquarters, Department of State for Health, Schools and maintenance departments. Clearly, the fleet services many more facilities than those directly linked to health delivery. As it is this sub-group that is the focus of this study, an attempt is made to link transport facilities to health facilities, and minimum requirements worked out for the different categories of facilities.

It is important to note that over 50% of health services at the peripheral level are delivered on a mobile basis. Vehicles allocated to health centres serve a variety of purposes including evacuation, MCH trekking, supervision of primary health activities, drug supply, and staff welfare. In addition, the supervision requirement both by DHTs and central level personnel exerts considerable demand for a reliable transport fleet.

Based on these factors, minimum transport requirement directly linked to health services delivery is proposed below. These do not include additional (indirect) requirements such for general administration, central level programme units, and so forth.

Type of Facility	Type of Vehicle	Quantity
Hospitals	Ambulance	1
	Laboratory services	1
	Utility (also used for evacuation)	1
	Total yearly maintenance cost (vehicles)	$2,675
Major Health Centres	Ambulance	1
	Utility/Trekking (also for evacuation)	1
	Motorcycles (Pool)	2 (pool)
	Total yearly maintenance cost (vehicles)	$2905
Integrated Health Centre	Ambulance	1
	Motorcycles	2(pool)
	Total yearly maintenance cost (vehicles)	$1780
PHC Village	Bicycle	1

1.5.2 Current resource base

The transport fleet comprises of four-wheeled vehicles (ambulances, utility and others) and motorcycles. The four-wheeled vehicle fleet is fairly standardised with the Toyota Model forming about 66% of the fleet. It is, however, in poor state: only 39% are completely roadworthy. With about 60% roadworthy, the predominantly Yamaha motorcycle fleet is in better state.

A key problem lies in insufficient budgetary provisions leading to chronic shortages of spares and consumables. In 1999, total provision for all vehicles, spares and consumables, is in the region of D750,000. A more realistic amount –either based on 5% investment value or through assessing the value of spares most likely to be changed in a year-- would be about D2,000,000. There is also inadequacy of tools, equipment and maintenance facilities, for the health transport unit.

The workforce is inadequate and insufficiently trained with limited prospects for growth. This has made hiring and retention of qualified people difficult. Apart from the transport manager, there are only two other people with technical certificate level qualifications. Another problem is the bureaucratised decision-making with regard to spare parts procurement. Civil service structure and procedures cause delays in procurement which translate to shortages in critical inputs.

The absence of a vehicle replacement plan has led to a situation where vehicles are kept longer that their optimal lives. Average age of the fleet is 6.36 years and 3.3 for four wheeled vehicles and motorcycles respectively.

1.5.3 Vehicle maintenance capacity in private and public sectors

The private sector has sufficient capacity for maintenance of vehicles in the urban area. In the rural areas, capacity is more limited especially in the area of tools and equipment.

Quantitative assessment of private and public sector performance is difficult because of operational differences and information paucity in both. The current health transport unit does not have a proper information system and does not carry out vehicle costing to reflect total costs of maintenance

On a more qualitative basis, the private sector is generally more efficient in resource utilisation. To ensure that maintenance activities benefit from perceived efficiencies of the private sector, a significant degree of restructuring is required before the option of out-contracting can be fully explored. Moreover, privatisation of health sector maintenance can only be a viable option if the concepts of decentralisation and capacity building at the regional level are equally widely embraced by other government departments.

1.5.4 Recommendations for transportation

General recommendations for a sector-wide maintenance system are summarised in section and further developed in chapter 6 of the main text. The ensuing section focus specifically on transport-related recommendations.

- It is recommended that in the short term, maintenance activities continue under the public sector regime as proposed in the Health Sector Requirement Studies; in the long term, private outsourcing can be an option. The following preparatory activities are recommended:
  - Introduction of a vehicle costing system that can provide accurate data on maintenance and repair costs;
  - Introduction of a good management information culture that permeates all levels of the transport unit;
  - Strengthening of the management and monitoring capabilities of the present transport management by equipping them with competence in contract negotiation and administration, costing and cost control performance evaluation based on such indicators as down-time, number of unscheduled breakdowns as a ratio of kilometres operated, and maintenance cost per distance (km).
- It is recommended that the present maintenance organisation which comprises units in Kanifing and Bansang be further decentralised to include another level at the divisional level: a mechanic based in DHT offices will carry out basic maintenance activities (level 2) involving the following:
  - Greasing, changing of oil, tightening of bolts and screws, and changing of tyres, light bulbs and fuses.
- In this new arrangement the driver is also seen as an integral part of the maintenance system and will carry out level 1 daily checks including:
  - Checking fluid levels (oil, water and brake fluid) and correcting, checking of tyre pressure, checking that brakes, lights, and indicators are working and starting engine and listening to unusual noise.
- At the strategic level, it is proposed that a Position of Director of Engineering Services be created and dedicated to engineering operations of the DoSH&SW. These will include the building, transport and equipment maintenance; procurement of investments in these areas; and overall supervision and monitoring of engineering-related activities in the health sector. This person may report to the Deputy Permanent Secretary. Additionally,
  - facilities should be improved and more tools and equipment provided (specific requirements are given in section 5.3.3.3.);
  - the budget for transport maintenance should be increased: a more realistic amount would be in the range of D2,000,000.
  - a proper information system would help in monitoring cost and effectiveness performance of the unit.

Man power

- A core of literate mechanics and drivers should gradually be built up. Mechanics should be GTTI or equivalent level graduates. Training should include skill development to produce multi-skilled mechanics and reinforce a new maintenance culture, to improve literacy and numeracy levels, and to improve system diagnostics and repair methods.
- There should be a succession plan that prepares young technicians and engineers to take over from the present transport management.
- Previous recommendations for improvement of work facilities and provision of tools and protective clothing will go a long way to enhancing level of motivation of staff.

Fleet Management

- A fleet replacement policy should be adopted. An economic life of 5 years for four-wheeled vehicles and 3 years for motorcycles is considered reasonable.

Management Information

- It is recommended that the following be incorporated into the information system of the transport unit:
  - Labour and overhead costs and analyses of breakdowns to determine causes and resulting down times. All information is to be based on kilometres operated (odometer reading);
  - All fuel, lubricants, spare parts and consumable costs are to be computed as ratios of kilometres operated. This will help in future budget preparation
  - It is important that the system emphasises the use of information in the measurement and improvement of transport services.

1.6 MAINTENANCE POLICY AND OPERATIONS

1.6.1 **Strategic Framework**

Budgetary allocation to health programs and to health assets maintenance has decreased in recent years and available technical skills for resolution of maintenance problems is increasingly inadequate. In the present dispersed organisational configuration, neither budget nor personnel can meet the demands of health services: thus, medical equipment has deteriorated and health infrastructure has fallen into disrepair.

Proper management of health assets should be approached at a national level with the establishment of a National Health Policy for Engineering and Maintenance (NHPfEM) which would define technical standards, criteria for choice of equipment, functional organisation of maintenance workshops, and other norms and standards.

Ii is observed that the National Health Policy 1994 - 2000 attaches great importance to maintenance of assets. The objective of that policy is to ensure that essential, safe, and cost-effective maintenance is made available at an affordable price. It anticipates provision of necessary support within the context of a prescribed sectoral framework with clearly defined targets and indicators. Its is within that context that the following NHPfEM is proposed.

1.6.2 Existing maintenance system

Maintenance of equipment and infrastructure has been accorded low priority in the delivery of health services in The Gambia with limited resources provided for the maintenance and replacement of equipment and infrastructure. The following are observed:

- the activity is fragmented over different departments with minimal co-ordination;
- it subsists as an under-skilled cluster of activities with few assigned qualified staff;
- there is no strategic or operational linkage to national health priorities.
- organisational hierarchy is weak: Hospital Maintenance Units are answerable to Chief Executive Officers, Hospital Boards, and the Permanent Secretary DoSH: while final responsibility lies with the PS-DoSH, lower levels of management are *de facto* and unco-ordinated; the hierarchy is far too centralised to achieve committed and efficient maintenance at all levels.

As a result, maintenance workshops do not function well. Reasons for non-performance are attributed to factors such as chronic shortage of funds, inadequate technical skills, absence of a national policy and weak planning skills. There is no comprehensive record of assets and their current state of repairs. All units operate according to respective self-developed policies, if any.

The shortage of maintenance staff has translated to the delivery of *ad hoc,* unplanned services at the level of facilities. Inadequate capacity of maintenance teams and difficulties in establishing guidelines for timely preventive and curative maintenance has resulted in the dilapidation of the majority of health facilities, including infrastructure, transport, and equipment.

Additionally, the maintenance budget is inadequate. For 1999, it was D1.4m for both buildings and equipment maintenance, and D750, 000 for vehicle maintenance.

1.6.3 Recommendations

National Health Maintenance Policy

The general objective of the NHPfEM is to ensure permanent protection of investments made in terms of infrastructure, vehicles and equipment, by applying better planning of procurement, works (construction and rehabilitation), and maintenance. To achieve stated objectives and to operationalise them effectively within the system, structures and procedures for engineering and maintenance should be strengthened with necessary resources. The strategies itemised below and detailed in section 6.3 of the main text constitute the basic prerequisites.

- **Strategy 1: Organise and strengthen the National System for Engineering& Maintenance (NSEM)**
- **Strategy 2: Rationalise the process of planning, design, programming, and construction/ rehabilitation of health infrastructure**
- **Strategy 3: Plan and implement the different operations regarding management of health assets**
- **Strategy 4: Make staff at the level of health facilities more sensitive**
- **Strategy 5: Design and Operationalise a Technical Human Resources Development Program**
- **Strategy 6: Plan the progressive transfer of the management of infrastructures and equipment from the central level to hospitals and Division Health Teams**
- **Strategy 7: Define a legal frame for the maintenance of the equipment in the health facilities**
- **Strategy 8: Develop technical standards for engineering and maintenance activities in the sector**

Maintenance costs and investments

The following table presents a budget for initial investments and for operational expenses of the proposed national policy of engineering and maintenance.

Annual maintenance costs

	Estates	Equipment	Vehicles	Total
Year 1	720.000	209.511	160.000	**1.089.511**
Year 2	746.536	213.711	168.000	**1.128.247**
Year 3	789.773	254.131	176.400	**1.220.304**
Year 4	884.064	281.033	185.220	**1.350.317**
Year 5	878.802	284.813	194.481	**1.358.096**
Year 6	1.027.145	310.455	204.205	**1.541.805**
Year 7	1.092.944	314.655	214.415	**1.622.014**
Year 8	1.131.368	318.855	225.136	**1.675.359**
Year 9	1.179.490	322.635	236.393	**1.738.517**
Year 10	1.269.963	325.995	248.213	**1.844.171**
Year 11	1.367.682	345.143	260.623	**1.973.448**

As regards equipment, the initial investment is estimated at U$ 663,000, including technical assistance, buildings, equipment and tools, vehicles, overseas and local training, an initial stock of spare parts, and technical documentation. To estimate the recurrent expenses for adequate maintenance, an average of 4% of the purchase value of equipment was utilised.

	Year 1	Year 2	Year 3	Year 4	Total (in U$)
International TA	115,500	115,500	0	0	231,000
Workshops (buildings)	45,000	45,000	0	0	90,000
Workshops (furniture, equipment and tools)	60,000	60,000	0	0	120,000
Transport	50,000	0	0	0	50,000
Training (overseas)	22,000	0	0	0	22,000
Training (national)	20,000	20,000	0	0	40,000
Initial lot of spare parts	50,000	50,000	0	0	100,000
Documentation	5,000	0	5,000	0	10,000
				Total:	**663,000**

Technical assistance: to be provided to strengthen the maintenance management capabilities and to set up the national maintenance system;

The budget for buildings includes extension of the building under construction in Kanifing and the construction of Divisional Maintenance Workshops;

Test equipment and tools: Under this rubric, 1 lot of specialised test equipment for the central workshop, 5 lots of specialised tools (3 for the and central workshop and 2 for the RVH), 11 lots of general-purpose test equipment (1 for each workshop) and 22 lots of general-purpose tools (1 for each technician, except RVH) are anticipated;

Transport: This budget anticipates a vehicle for the central workshop and one motorcycle divisional workshop

Overseas training to strengthen local maintenance management capacity (strategic planning and operational management);

Local training will provide 24 engineers (12 per year during two years);

An initial lot of spare parts to allow the workshops to repair equipment which are out of order at present.

A budget for technical documentation.

2 Background

The Government of The Gambia (GOTG) has received a credit from the International Development Agency (IDA) for the Participatory Health, Population and Nutrition Project (PHPNP) managed by the Department of State for Health and Social Welfare (DoSH&SW) with IDA (World Bank) support. The PHPNP aims to improve family health in rural Gambia and to substantially improve delivery of reproductive health and other services by government and non-government organisations. In parallel, the GOTG has received additional funding for the Health Services Development Project (HSDP) with AFDB support. Both projects will contribute to improving the health infrastructure, development of which was initiated under the IDA financed National Health Development Project (NHDP). The DSH&SW will co-ordinate AfDB and IDA projects toward realisation of government objectives.

In 1996, with AfDB financing, the DSH out-contracted a Health sector Requirements Studies (HSRS) which, *inter alia*, estimated costs of rehabilitating and equipping 50 pre-selected facilities,, and forwarded proposals for rehabilitation of the existing maintenance system.

As part of PHPNP preparations, the DoSH&SW and IDA reviewed the HSRS data and agreed to commission additional studies to include comprehensive needs assessment, finalisation of the civil-works component of the PHNP project, and preparation of a national maintenance strategy This report is the main output of that arrangement.

3 Methodology

A comprehensive review of relevant documents obtained from the DoSH&SW was conducted; health experts from the department of state as well as other health sector partners in The Gambia were consulted, and field trips for additional required data were embarked on.

An inception report was prepared and discussed during a first consultative meeting at the DoSH&SW. At that forum, proposals for streamlining of the health structure and definition of the MPA were tabled. A consensus on these preliminary proposals was a fundamental requisite to detailed formulation of norms and standards, definition of architectural, equipment and staffing requirements, review of existing lists, and preparation of an investment program and maintenance strategy. Several working meetings were subsequently conducted with the DoSH&SW to finalise this aspect of the study, leading to agreement on the health pyramid and MPA was achieved at the end of the third week.

Subsequent to the agreement on basic health structures, in-depth analyses of logistical and programmatic aspects were initiated including assessment of bed needs and review of standards and norms for civil works, equipment, transport and staff. A national maintenance strategy was developed. Layouts of facilities and departments were also developed in close collaboration with the PIU and various field experts.

In week 6 of the exercise, an interim report was prepared and circulated. A consultative forum for discussion of findings and recommendations was convened at the Friendship Hostel, followed by a similar gathering at the Kairaba Hotel for presentation of the draft final report. PHPNP comments on the draft final report and consultants' responses are incorporated as annex G of this final report.

4 Organisation of services provided

4.1 THE HEALTH PYRAMID

4.1.1 Background

The Alma-Ata Primary Health Care (PHC) system was adopted by The Gambia in 1978 and has since formed the basis of national health policy. The system is organised around primary, secondary and tertiary levels of care.

The PHC Action Plan (1980/81–84/85) centred on mobilising resources for extending health services to all in order to attack disease directly and to redistribute health services in favour of the poor also. Implementation of the PHC Action Plan resulted in significant improvements, including:

- EPI, ARI, CDD, STDs, and nutrition programmes;
- construction of new health facilities;
- increase in MCH clinics;
- training of at-risk mid-wives;
- improvements in access to services: approximately 90% of the population now live within 7.5 kilometres of a health facility, and 60% to 80% of villages participate in a PHC program.

The objective of the national policy document "Health Policy 1994-2000: Improving Quality and Access" is improved access to health care for all citizens and provision of an improved quality of care also. The document proposes 2 major directions for further development:

1) Consolidation of existing services to ensure optimum functionality in improving quality of care, effectiveness and efficiency.
2) Selective expansion of services to ensure better coverage and access

With regard to the health pyramid, strategies for consolidation of existing services include:

- Decentralisation of services delivery with the creation of 6 divisional Health Teams;
- Capacity strengthening at the primary level to ensure the functionality of existing PHC Villages;
- Strengthening of the secondary level to ensure the full operationalisation of all Major Health Centers, and the refurbishing and equipping of existing minor health centers and dispensaries;
- Strengthening the tertiary level by refurbishing, equipping and otherwise ensuring full operationalisation of the 2 referral hospitals.

Proposals for the expansion of services include:

- Introducing the PHC system in all villages with population of 400 or more;
- Increasing the number of basic health care facilities by upgrading selected trekking stations to dispensaries;
- Upgrading Farafenni major health center to a referral hospital.

These strategies for enhancing health delivery have resulted in:

- The establishment of 396 village health services with trained village health workers (VHW), traditional birth attendants (TBA), and functional village development committees (VDC), that provide PHC access for about 60% of the population.
- The expansion of secondary services with the upgrading and construction of new health centers.
- The extension of MCH/FP and EPI delivery points from 81 in 1982 to 196 in 1999.

The Health Action Plan 1999–2003 was released in April 1998. It sought to consolidate the gains of the first action plan. Additionally, through selective expansion of PHC services and incorporation of new programmes, it attempted to improve access and quality of care in such areas as safe motherhood, family planning, child survival, proper nutrition, control of common endemic diseases, health promotion and protection, and the provision of essential drugs and vaccines.

4.1.2 Existing delivery system

Responsibility for the delivery of health services is devolved to the Department of State for Health (DoSH). The health care system is modelled on the primary care strategy and is organised into primary, secondary and tertiary levels of services delivery. Health services are delivered through PHC villages, Basic Health Services and Hospitals, with administrative support at central and divisional levels.

4.1.2.1 Health delivery facilities

4.1.2.1.1 PHC Villages

The Primary Level or Village Health Services (VHS) is made up of

- Primary Health Care Villages
- Key Villages
- Outreach or trekking stations.

The VHS was established as a consequence of government focus on and commitment to the provision of primary health care services as articulated in the 1981/1986 5-year development plan. They were established in keeping with the policy tenet of community involvement and responsibility for local health services. Village Health Services -- community-based services financed by communities themselves-- form the lowest level of the health care delivery system and is the main medium through which PHC services are provided to the rural population.

PHC Villages include all settlements of 400 or more people. Almost 400 PHC villages are in existence, each of which has a trained VHW and TBA operating from Health Posts within these villages. The role of the Village Health Worker is to maintain the supply of essential drugs, provide outpatient care, make home visits, and conduct outreach education. TBAs conduct deliveries and identify and refer at-risk mothers.

A Key Village is 1 village within a cluster of 4 to 5 PHC Villages. Key Villages (KVs) are served by Community Health Nurses (CHN) operating from dispensaries within these amalgamated villages. VHWs and TBAs in PHC villages are supervised and trained by CHNs.

Medical staffs from health facilities operate outreach or trekking stations in KVs periodically so that the latter generally serve as MCH outreach points for health facilities. The CHN is supervised by outreach services staff and by the DHT (also).

Communities are involved in VHS through 2 committees:

- The Village Development Committees (VDC)
- The Catchment Area Committees (CAC)

These Committees are the communal managing authorities for Village Health Services. Their activities, as well as those of primary and secondary health facility staff, are overseen by DHTs.

The VDC implements the village health services plan, formulates health project proposals, establishes mechanisms for effective community participation and intersectoral co-ordination, mobilises resources for village health programmes through income generating projects, collects basic data of health services and resources at village level and monitors village health services.

The CAC is a collective that includes representation from villages (PHC and Non PHC) and basic health facilities.

4.1.2.1.2 Basic Health Services

The secondary or basic health services (BHS) level includes:

- Major health centers,
- Minor health centers,
- Dispensaries.

There are 6 Major Health Centers. Generally, each division has one Major Health Center. 2 are located in Western Division and none in North Bank East Division which, however, has a hospital in Farafenni. Major health centers are staffed by Doctors, Registered Nurses, Enrolled Nurses, as well as other technical staff.

The 12 Minor Health Centers are unevenly distributed among the divisions: 4 in Western Division, 2 each in Lower, Central and Upper Divisions, and 1 in each of the North Bank Divisions. Minor health centers have a similar staff profile but are without Medical Doctors.

Sixteen Dispensaries are distributed throughout the country: 5 in Central division, 4 in Western Division, 3 in Upper, 2 in North Bank East, and in Lower and North Bank West Divisions. These dispensaries are staffed by enrolled nurses and CHNs.

4.1.2.1.3 Hospitals

Tertiary services are currently provided by three hospitals operated by the DoSH&SW:

- Royal Victoria Hospital (RVH) in the capital, Banjul,
- Bansang Hospital in Central River Division
- Farafenni Hospital in North Bank East Division.

Construction of a hospital in Bwiam is in progress, and plans for the construction of a hospital in Serekunda are being progressed. Additionally, construction of a Paediatric Hospital in the Greater Banjul Area is a possibility.

The three existing hospitals serve as training and referral facilities. Hospitals are semi-autonomous, managed by respective Hospital Management Boards.

The *Royal Victoria Hospital* (RVH) is the main referral hospital for the country and offers specialist consultant services. It operates a tuberculosis sanatorium, a psychiatric wing, and a home for the infirm. Specialist consultant services cover internal medicine, surgery with anaesthesia, obstetrics and gynaecology, paediatrics, pathology, ophthalmology, dentistry, and radiology. The hospital also operates a pharmacy, laboratory services, and a polyclinic that provides primary care for Banjul and surrounding areas.

The Royal Victoria Hospital has a total bed capacity of 626 divided into 9 wards including maternity, gynaecology, medical male and female, surgical male and female, paediatric male and female, and eye.

Expansion is a continuing process. A private ward, surgical daycare centre and a medical intensive care unit have all been completed recently. When fully operational, bed capacity will increase to 648. Available data recount 15,897 admissions, 6,440 deliveries, and an occupancy rate of 96%. In addition, 85,374 outpatients were serviced.

Bansang Hospital is a referral facility for the eastern half of the country. Bansang is located in Central River Division approximately 300km from Banjul. Over 345,000 people are in Bansang Hospital catchment area, one-third of Gambia's population. With 135 beds, Bansang Hospital offers a more limited array of specialised services than RVH including Paediatrics, Obstetrics and Gynaecology, Surgery with anaesthesia (high complex and resource-intensive surgery such as cardio-thoracic surgery is not performed), Pathology, Dentistry, Radiology, and Acupuncture. The hospital has assistance in the form of a Chinese medical team which performs surgery, treats outpatients, and operates a pharmacy.

Bansang hospital has a laboratory that is backed-up by the Medical Research Council's (MRC) laboratory facilities in Basse. This is particularly true for microbiology tests since the Hospital laboratory lacks the technicians, equipment and supplies to run such tests. The hospital also operates 2 pharmacies, for Western and Chinese medication.

Inpatient utilisation pattern is similar to that of the RVH. Overall, the hospital admitted 6,307 patients in 1993, amounting to a general occupancy rate of 47%. The hospital also operates an extremely busy outpatient department that sees over 250 patients per day.

Farafenni is a new 110-bed hospital. It is the only hospital in the North Bank; both RVH and Bansang hospital are in the South Bank. Its catchment area is a population of about 200,000 living in the central portion of North Bank Division, CRD Northwest and the adjacent south bank settlement of Mansakonko. Farafenni Hospital provides basic services in surgery, paediatrics, obstetrics, ophthalmology and dentistry. When fully equipped, it will cater for referrals and provide support to PHC services in North Bank East.

4.1.2.2 Health Services Administration

4.1.2.2.1 national level

The Department of State for Health and Social Welfare is organised into 3 directorates -- health services; planning and information; and support services-- which are collectively responsible for the delivery of health services. The DoS is supported by a number of support (finance, drugs, planning), and programme units (MCH/FP, TB).

Primary and secondary health services are the responsibility of the Directorate of Health Services while public hospitals are managed by boards that answer to the Permanent Secretary of the DoSH.

4.1.2.2.2 divisional level

At the divisional level, DHTs are responsible for the management of the health system. This includes day-to-day administration as well as management and supervision of secondary (major and minor health centers and dispensaries) and primary level facilities (village health services) in their respective Divisions. In 1993, the 3 health regions were split into 6 geographical health divisions, each managed by a DHT.

4.1.3 Analysis

The health sector lays considerable focus on integrated and cost-effective delivery of services (Health Policy 1994-2000). Specifically, there is strong emphasis on:

- departure from “verticalisation” of programmes toward integrated delivery at both primary and secondary facilities;
- decentralisation of services and ancillary administrative structures, and avoidance of redundancy and duplication;
- design and implementation of well co-ordinated and cost effective interventions;
- improvement of public access by expanding services to new areas while consolidating existing services;
- establishment of PHC villages in difficult-to-access settlements and in communities of over 400 persons.”

Currently, the health pyramid offers 3 levels of service delivery.

> The *primary level* comprises a network of PHC and key villages, which serves as point of entry into the system. The PHC/key village system has been effective in facilitating access into the health delivery system: it currently covers 72% of the designated catchment population.
>
> The *secondary level* is not efficient. Too many categories of facilities are accommodated. Distinctions among them have become blurred over time, and this is reflected in significant overlapping of services performed.
>
> The *third level* already consumes a disproportionate level of limited health resources. Completion of projects in the pipeline will exacerbate this anomaly. Almost all "beds" are located at this level.

On paper, health services at hospitals and major health centres should be accessed only on referral. In practice, facilities such as Brikama Major Health Center are overwhelmed by the demand for primary care. DHTs --which should be playing an important role in the organisation of the health services-- are weak with regard to staffing, material resources and planning capacity.

The Primary level: demographic and geographic coverage of PHC Villages

The Primary level or Village Health Services is effective in facilitating geographic access into the health system. The PHC/key village system is estimated to cover about 60% of the rural population, and 72% of the designated catchment population. Thus, national coverage is satisfactory even if distortions are apparent in some divisions. Indeed, there are significant disparities between divisions such as between Western and North Bank Divisions.

The strategy of establishing PHC / Villages Health Services in villages with populations of 400 or more or where access is particularly difficult is an appropriate mechanism for improving access. The system of PHC villages has also had positive effect in reinforcing social or cultural access to services by involving communities in service delivery. The VHS, utilising local TBAs and CHWs under the supervision of CHNs, co-opts communities into participating in their own health care quite effectively.

The resultant improvement in the health status of the Gambian population has largely derived from this organisation. Considerable reductions in infant mortality, under 5-year mortality, and maternal mortality rates, have been noted. Between 1973 and 1983, infant mortality rate fell by 23% from 217 to 167 per 1000. In 1993 IMR was estimated at 85 per 1000, a decline of almost 50% between 1983 and 1993.

The Secondary level: gaps and redundancies

The Secondary level is not efficient. There are too many categories of facilities including major health centre, minor health centre, dispensary, and sub-dispensary. The hierarchical and organisation link among these is not as precise as suggested in organisational charts (see annex 6). Indeed, there are disparities even within facilities in the same category and with the same nomenclature, depending on location. Such structural and operational ambiguities make efficient management of the system difficult.

The referral system is weak: major health centers do not have the staff required and are overwhelmed by demand for primary care. Supporting units such as theatre, pharmacy, and laboratory are not fully equipped.

The Tertiary level: disproportionate consumption of resources.

A solid referral system is indispensable to the proper functioning of any health system. In organising the health pyramid, it is essential to have a tertiary referral facility in some Divisions, with experienced staff and specialised equipment. The existence of a relatively sophisticated facility in close proximity to the populace reinforces the credibility of the health system as a whole. For facilities at the secondary level, the option of recourse to more specialised services in cases with high degree of complexity or seriousness reinforces staff confidence.

However, tertiary facilities must not monopolise resources to the detriment of lower level units. Currently, Gambia has 3 referral hospitals. This translates to 1 referral hospital per 400,000 inhabitants, which is satisfactory for a country of the size of The Gambia. In May 1998, with only 2 referral hospitals operational, the DoSH noted in its Public Expenditure Review of the Health Sector that:

> *"Nearly 40% of the Department of State for Health's labour force, including nearly 80% of it Doctors and the majority of more qualified nurses (SENs and SRN), are employed in these hospitals. (…) The hospital sub-sector comprises by far the largest category of recurrent health expenditures, ranging between 42% and 47% since 1990. Such levels of expenditure (…) are explained by the fact that the vast majority of qualified, technical personnel in the sector are employed in hospitals.(…). Government's current resource allocation favouring the hospital sub-sector requires restructuring so that more resources can be channelled to primary and secondary care where significant efficiency and equity gains can be realised.(…) Government resources allocation between the hospital and non-hospital sub-sectors will required close attention by policy makers."*

Moreover, the PER underlined the fact that many of the expatriates employed in The Gambia are not included in official government health expenditures. As many as 71% of doctors employed in RVH are expatriates principally Cuban, Nigerian, and Egyptian personnel funded by bilateral assistance programmes. If their salaries were included in hospital expenditures, hospitals' share of health sector expenditure would be even more disproportionate.

Compared to other countries in the sub-region, levels of expenditures in Gambia's hospital sub-sector are high. According to the Guinea 1996 Public Expenditure Review and the Senegal 1993 Public Expenditure Review, the hospital sector in Guinea constitute 22% of health expenditures while 4 tertiary hospitals in the latter country make up 23% of total expenditures. Clearly, additional development of the tertiary sector in the Gambia would entail further consumption of resources at the expense of secondary and primary levels.

DHTs, which should play an important role in the organising health services, are weak. These units have a particularly important role to play because they must assure that the population has access to programmes at an optimal cost-efficiency ratio.

Consequently, DHTs must be directly linked to decision-making processes with regard to locating new health establishments, determining services to be provided by the MiHCs & MaHCs, and establishing norms for staffing local facilities. They also have important responsibilities with regard to co-ordinating activities of public and non-public actors within Divisions.

DHT effectiveness will be proportional to degree of programme integration at the national level, level of autonomy to manage human and financial resources at divisional level, and effectiveness of community control structures that are in place.

4.1.4 Improvements proposed

The revised health pyramid must lay particular emphasis on re-organising the health system at regional level.

In effect, the Division constitutes a geographic nexus between the needs of the community and policy priorities of the nation. It is at this level that policies, planning, and practical reality must meet. Realistic solutions can be developed provided that there is adequate infusion of human and material resources; and that sufficient authority is delegated thereto. As key sectoral actors are represented at that level, it offers an appropriate arena from which to co-ordinate actions, engage the community in the planning and implementation, and improve co-ordination of health services delivery. Additionally, the Division is sufficiently close to the community to develop a more visceral understanding of local problems and constraints.

The importance of an integrated approach at the divisional level suggests the DHT should be located in the same city as local government authorities so that the sector is aggressively represented in Divisional Co-ordinating Committees.

Considerable progress has been made in extending services coverage and in implementing programmes such as vaccination. The promotion of healthy behaviour and the prevention of illnesses within the community have received a lot less attention than the curative aspects of health. In administrative Divisions, epidemiological methods have been rarely used to assess the health status of the population or to identify important problems and the more vulnerable groups. The health mapping exercise and its follow-up activities will be an important decisional tool particularly for divisional personnel.

Primary level: reinforce organisation, increase number of PHC villages, and rationalise distribution with due regard to remote areas.

As mentioned earlier, the organisation of the health system at the primary level translated to significant gains. It is necessary to preserve this organisation, while improving the quality of outputs particularly with regard to populations in difficult-to-access areas. To achieve that objective, isolation and access factors must be included in with population indicators in determining PHC settlements.

Villages that did not meet the 400-inhabitant threshold in 1979, now qualify for PHC status. In view of the numbers involved, villages in vulnerable areas should be given priority, especially in the north of CRD/URD and Western Division.

Maternal and infant mortality rates remain high in Gambia, although more than 60% of reported deliveries are now conducted by health workers including TBAs. In an evaluation of the TBA programme conducted by the MOH in 1990, it was concluded that TBAs could and did identify at-risk mothers early in pregnancy. According to the 1997 MCH report, 56% of all outpatients seen at government health services were attended to by a VHW, compared to 40% in 1989.

MMR reduction requires the development of MCH services at the most peripheral level. This expansion will allow increase in coverage of MCH / FP services by increasing the number of delivery points, targeting vulnerable and inaccessible groups, ensuring the availability of basic equipment for managing MCH Clinics, and expanding EPI services to increase coverage to 90%. EPI needs to be integrated into PHC in key villages so that the service can be provided by CHNs.

Secondary level: rationalise structure and hierarchy

- ***eliminate confusion by integrating structures to 2 sub-levels only***

The secondary level must be rationalised. It must comprise a network of (integrated) health facilities, connected to and supported by a referral facility. For reasons of efficiency, the referral center must be located in divisional capitals, site of the DHT.

Two packages of health care services should be provided at the secondary level: a minimum package and a complementary package.

In line with the principles of efficiency, co-ordination and cost-effectiveness articulated in the Health Policy document, 2 categories of health facilities should deliver these health bundles: the Minor Health Centre (MiHC) and the Major Health Centre (MaHC). Existing facilities will be graded along these two categories according to the needs of respective catchment areas.

Each level of the pyramid should provide only what cannot be provided at lower levels of the pyramid; and should not offer services available at higher levels. The scope of services provided at each level should be different and complement other levels of the health pyramid.

MiHCs should provide the minimum package of activities (MPA) including safe motherhood, family planning, child survival, proper nutrition, control of common endemic diseases, health promotion / protection, and provision of essential drugs and vaccines. MaHCs should provide the complementary package of services (CPA) which includes referred consultations, in-patient care, obstetric emergencies, medico-surgical emergencies, referred laboratory services, and referral imaging services. All vertical programmes should be integrated into this pyramid .

In cities and towns where a MaHC exists, a MiHC should also exist. The 2 may share the same site but should operate as separate entities (perhaps labelled a polyclinic). This

organisation should also apply to places where a referral hospital is located. Equally, these towns would require a MiHC (or polyclinic) to deliver primary care.

- ***Minor Health Center***

The cornerstone of the pyramid is the MiHC. Each disease or health problem must have a solution at this level, including:

- diagnosis and treatment ,
- emergency treatment,
- delay for consultation by the supervisor, and
- referral of the patient in good conditions

Most common health problems --measles, malnutrition, tuberculosis and sexually transmitted diseases-- can be treated at a well-functioning MIHC. In 80 to 90% of cases of preventive interventions and in the majority of cases of curative care, MiHC provides better services than a MaHC or hospital with respect to continuity, entirety, integration, and cost of care.

The limited size of the MiHC facilitates integration of different programmes. It is easier to increase immunisation coverage or to register progress in the domain of family planning when MiHC staff can consult the growth chart, file, or vaccination record of a sick child. In a MaHC or a hospital, such continuity is lacking. Over-prescription of drugs is a phenomenon that is less frequent in MiHCs than MaHCs or hospitals. In Ghana for example, survey showed that the average drug cost per person and by treatment was $0.20 in a hospital compared to $0.07 in a MiHC.

Clearly, the comparative advantage of the MiHC is that it is more accessible and staff cultivates better linkages to members of the community. The intimate scale on which it operates facilitates allows familiarity with social and home environments, prevents abandoning of treatment in progress, and facilitates resumption of contact if patient has stopped treatment. Continuity of care presupposes a relationship between health worker and patient: smallness of scale is a necessary though not a sufficient condition for such patient-health worker empathy.

Major Health Center

In its PER the DoSH notes: *While hospitals respond to many of Gambia's most common illnesses, many might be treated more efficiently and/or prevented at lower levels of service delivery if these levels had more experienced staff and sufficient supplies and equipment*. In theory there should be no direct access to the MaHC: the first contact should always be at a lower level facility. Health activities that cannot be implemented at the MiHC level for technical (e.g. surgical activities) or economical reasons (e.g. X-Ray) should be accommodated at the MaHC. The medical doctor must be considered a scarce resource to be conserved for referrals only (i.e. patients that cannot be treated with the expertise available at the MiHC level). The minimum package of activities for MiHC and MaHC should cover 90 – 95% of the health problems of the population in the division.

The MaHC serves as a back up to the MiHC principally in inpatient care and outpatient care by physicians. The MaHC should have the technical ability to deal with referral level problems, and should be organised accordingly. Otherwise, the workload involved in meeting the demand for PHC may interfere with its proper referral functions. This is so particularly for outpatient curative care. When access to the MaHC is unrestricted, it becomes impossible for physicians to see all patients. Consequently, MaHCs must filter access to physicians. Even so, outpatient work will take up a large proportion of physicians' and paramedical personnel time.

Generally, however, MaHCs and hospitals attract large numbers of people with problems that could have been solved at the first contact level. The reasons are manifold. Among the most important is the powerful attraction of MaHC or hospital technology compared to the more basic equipment on offer at MiHCs. A second reason is that there may be no real alternative to the MaHC. The quality of care at lower level facilities may be sub-standard to the point that people are willing to go to the expense and inconvenience of undergoing the travel and queuing required to be treated at MaHCs or hospitals.

The role of the divisional MaHC must be re-examined with a view to efficiency, sustainability of peripheral units and community confidence building. Strategies for integrating MaHCs with other activities within the Division and for involving MaHC staff in PHC activities (outside of the facility and in the community) must be developed. Training programs created should be geared to developing staff interest in the PHC system.

Tertiary services

These are currently provided by Royal Victoria, Bansang and Farafenni hospitals. They provide support and technical assistance as well as training for health staff, and they are also called upon to make rare interventions. Hospitals should be viewed as partners in the provision of health care rather than as competitors with lower level facilities. Generally, intensive consumption of resources tend to compromise overall benefits of primary health care. The real contribution and linkage to the rest of the health system should be judiciously assessed. Instead of being treated as special institutions with disproportionate access to resources, they should be subjected to careful examination to determine cost effectiveness.

The 3 hospitals are well distributed on the territory. They can play the role of regional referral facilities. Before the creation of the Farafenni hospital, both referral hospitals were situated on the South Bank. Accessing quality care in the North Bank proved arduous because of difficult terrain, poor roads and poor telecommunications.

In light of the large population in the Kanifing Municipality, construction of a referral facility with about 150 beds is required. In the context of the health pyramid, its level and role should be that of a MaHC. In view of the population density also, it would be best to hive-off Banjul and Kanifing municipalities from WD. Serekunda would house the DHT as well as a new MaHC (instead of Serekunda Hospital). The establishment under construction in Bwiam will have a similar role. Given its geographical position and very small catchment area, this facility should also play a role of MAHC in the health pyramid, rather than that of referral hospital.

4.2 MINIMUM PACKAGE OF ACTIVITIES (MPA)

4.2.1 Existing levels of activity

The 3 documents that serve as references for definition of health services to be delivered at each level of the pyramid are the Health Sector Requirement Studies, 1995 (HSRS); the PER 1998 and the Report on extended Senior Management meeting, DoSH&SW, December 1998 (DoSH SMM).

4.2.1.1 Primary level

Practitioners at PHC villages provide basic diagnostic, treatment and obstetrical care and also referral to dispensaries or health centers.

According to the ESU, DoSH (1997), PHC villages:

- maintain supply of essential drugs;
- provide outpatient care, make home visits;
- carry out health education;
- conduct deliveries;
- identify and refer at-risk mothers.

The role at this level was expanded on in the 1998 DoSH SMM:

- provide care for minor ailments;
- prevention and promotion activities.

During the HSRS, activities observed at the primary level were articulated as follows:

- disease management: very basic diagnostic, treatment;
- MCH: very basic obstetrical care;
- referral to dispensaries or health centres.

Services delivered at the trekking stations are the following:

- health education;
- antenatal, postnatal care;
- infant welfare care;
- sometimes, dental services.

Additionally, participants at the DoSH SMM recommended that outreach stations deliver MCH, FP, EPI and Nutrition Education.

4.2.1.2 Secondary level

Distinctions must be made among the services delivered by the 3 types of facilities at this level (major, minor and dispensary):

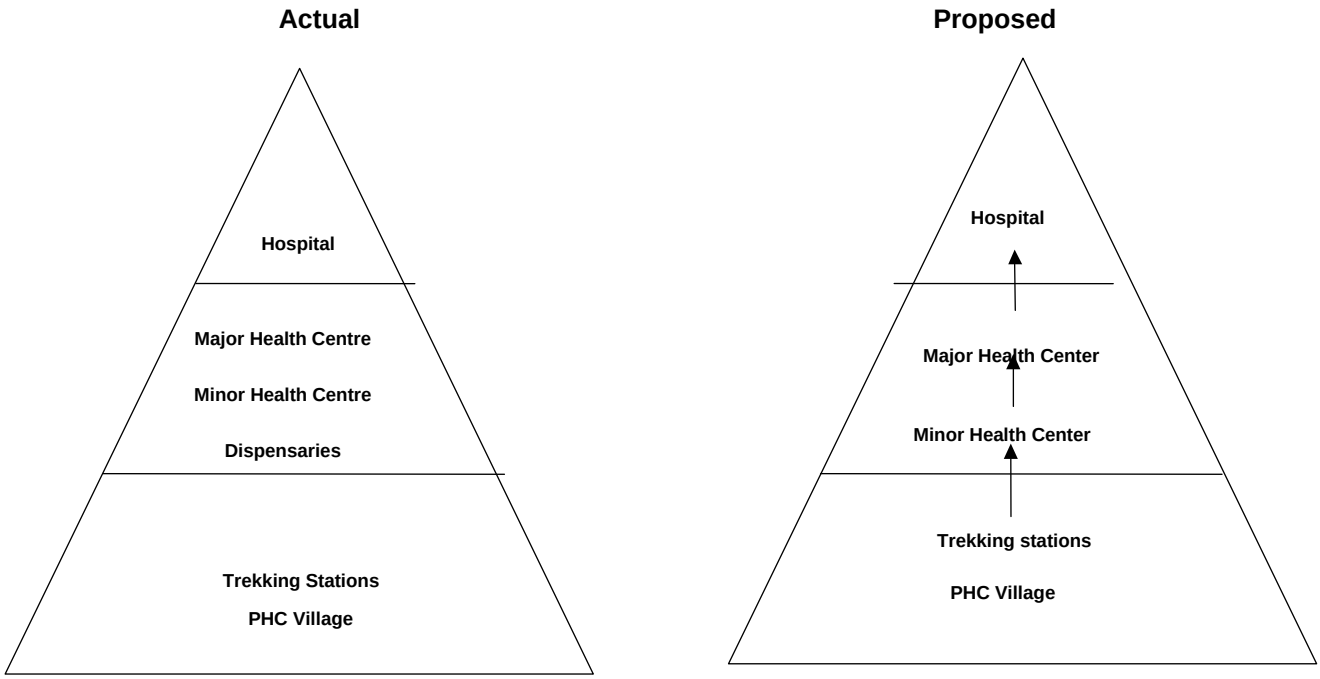
Major Health Centres

The range of services provided by major health centres fall into the following 6 general categories.

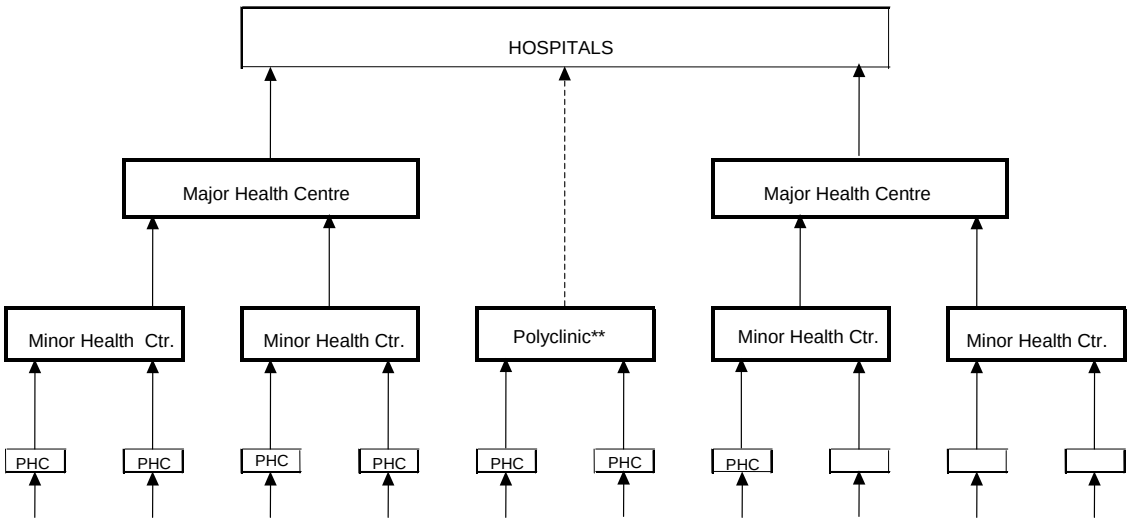
- Family planning: prescribe contraceptives and follow-up users; perform surgical contraception for men and women;
- Maternal and child Health: Provide basic gynaecological services; manage normal and complicated deliveries (including C-section); counsel mothers on infant and child nutrition, audit maternal deaths; provide antenatal, postnatal care (in facility and through treks);
- Disease Management: Diagnose and treat cases of diarrhoea/dehydration, ARI, malaria, AIDS, STDs, leprosy and TB; manage simple mental health cases;
- Minor Surgery, Radiology Services, and Laboratory Services;
- Referral: refer and transport serious illnesses and injuries, or cases needing specialist care, to the nearest public hospital.

They are managed on an outpatient or --as necessary-- inpatient basis.

The health pyramid streamlined will be as follows:



Access to health care will be as follows:



** only for Minor Health Centres located in the same city as hospitals (ie Bansang, Farafenni and Banjul.)

Major Health Center provides services as follows:

- Out-patient services
- In patient
- PHC
- Disease management
- MCH / FP (including obstetric services, vaccinations and contraceptives)
- Minor surgery and laboratory services
- Referral of serious illness
- Eye care
- Leprosy and Tuberculosis control
- Public Health services

(ESU DoSH 1997, quoted in table 1.5, p.12 PER).

- Out-patient services
- In patient
- Maternity
- Surgery
- Obstetrics
- MCH Lab,
- Pharmacy,
- Radiography

(Report on DoSH extended SMM, December 1998).

- FP: Prescribe contraceptives and follow-up users, perform surgical contraception,
- MCH: provide basal gynaecological services, manage normal and complicated deliveries, counselling in infant and child nutrition, provide ANC and postnatal care,
- Disease Management: diagnose and treat diarrhoea, ARI, malaria, AIDS, STDs, leprosy, TB, manage simple mental health cases,
- Minor Surgery,
- Radiology
- Laboratory Services,
- Referral,

(HSRS reports)

Minor Health Centres

The range of services provided by Minor Health Centers include:

- Family Planing: prescribe contraceptives and follow-up of users.
- Maternal and child health: provide basic gynaecological services; perform normal deliveries; counsel mothers on infant and child nutrition, audit maternal deaths; provide antenatal, postnatal care (in facility and through treks).
- Disease Management: diagnose and treat cases of infectious diseases such as diarrhoea/dehydration, ARI, malaria, AIDS, STDs leprosy and TB; follow-up simple mental health cases.
- Minor suturing.
- Referral: Refer and transport serious illnesses and injuries, or cases needing specialist care, to the nearest major health center or public hospital.

The ESU, SMM and HSRS list the following services:

- MCH / FP (including obstetric services, vaccinations and contraceptives)
- PHC

- Disease management
- Referral of serious illness
- Eye care
- Leprosy and Tuberculosis control
- Public Health services
- In patient
- Out-patient services

(ESU DoSH 1997, quoted in table 1.5, p.12 PER.)

- Out-patient services
- in patient (max 20 beds),
- maternity,
- MCH Lab,
- Pharmacy

(Observed during in HSRS)

- FP: prescribe contraceptives and follow-up users
- MCH: provide basic gynaecological services, manage perform normal deliveries, counselling in infant and child nutrition, provide ANC and postnatal care
- Disease Management: diagnose and treat cases of infectious diseases such a diarrhoea, ARI, malaria, AIDS, STDs, leprosy, TB, follow-up simple mental health cases
- Minor Suturing
- Referral

(Report on extended DoSH SMM)

Dispensaries

Dispensaries are similar in scale and function to Minor Health Centers. Their main functions are infectious disease surveillance and treatment, maternal and child health care, co-ordination of primary health care outreach activities, and referral of more serious medical conditions to MaHCs.

The 1997 DoSH ESU quoted in table 1.5, p.12 of the PER stipulate the following:

- MCH / FP (including obstetric services, vaccinations and contraceptives)
- PHC
- Disease management
- Referral of serious illness
- Outreach services through treks
- Public Health services
- Out-patient services

Other sources such as the report on the DoSH SMM do not give any description of services at this level.

4.2.1.3 Tertiary level

Services provided at the tertiary level are not as detailed as those of the primary and secondary levels. Essentially, there is specialised care using more sophisticated equipment. It should be noted that PHC is currently also delivered at the tertiary level.

4.2.2 Analysis

Choice of services to be provided at each level of the pyramid is driven by national epidemiological targets and interventions that have the best cost-efficiency ratio. The MPA should be defined to ensure patient care at the lowest possible level of the pyramid. Activities integrated into the minimum package at the primary level have to take into account the affections that weigh most heavily on the health of the population, particularly of the more vulnerable groups such as children.

Available epidemiological data identifies 3 major affections: malaria, ARI, diarrhoea and malnutrition. Malaria is endemic with a marked seasonal variation. Most cases occur in the rainy season. It is the leading cause of morbidity and mortality, and is estimated to account for 4 percent of deaths in infants and 25 percent of deaths in children aged 1-5 years. In 1995, the mortality rate for malaria was 6.3 per 1,000 for infants and 10.7 per 1,000 for 1-4 year old children. Around 1,000 children die from the direct effects of malaria every year and the disease contributes indirectly too many more deaths.

No national estimate of the incidence of ARI is available although a number of localised surveys indicate the extent of the problem. MRC studies of infant mortality over a 7-year period around Farafenni in NBD found that 14% of under 5-yr. infant mortality was caused by ARI. Among children in the first month of life, ARI was the cause of 19% of mortality. A survey of rural community morbidity in URD in 1988 found that 35% of under 5-yr olds suffered from acute lower respiratory tract infection in the previous year (both data from ARI Program Action Plan). Hospital statistics prior to the introduction of the ARI Program indicated that it was the second most common (after malaria) reason for attendance at a health facility. In 1993, it was the third most common diagnosis for children admitted to RVH with over 9% of admission (RVH annual report). According to routine reported statistics, there was an average of 73,000 cases for the period 1990-1996.[i]

Malnutrition is common in the Gambia. Children under 5-years suffer from of malnutrition (10%-25%) which is manifested in stunting and underweight. Marasmus are not uncommon while kwashiorkor is relatively rare. Trends in the incidence of malnutrition are measured through biannual surveys of 5-yr old children by CHNs in all PHC villages. In addition to showing fluctuations over time, results of this monitoring show seasonal variations: malnutrition being more prevalent during season when food stocks of the previous year's harvest are exhausted and the crops for the current year not yet available. The MICs of 1996 provide a population-based indicator of the level of malnutrition: 21% of children exhibited signs of moderate weight for age malnutrition, 5.3% were malnourished. Height for age, an indicator of more long-standing nutritional problem, was also higher: 23.2% of the children screened were moderately stunted while 7.2% were stunted.

Malaria, ARI, and diarrhoeal diseases are the main killers of Gambian children accounting for 60% of the IMR and a significant portion of the disease burden. The fact that case management for all 3 diseases are inextricably linked urges greater integration

of management strategies. Priorities in environmental hygiene should include the monitoring and supervision of the disposal of refuse, human and hazardous materials. Previous research indicate that improvement in the provision of water and sanitation often has the effect of reducing the infantile mortality due to diarrhoea diseases by 50% and sometimes by 80%, depending on type of intervention and the existence of risk factors such as poor nutritional behaviour (Esray et al, 1991).

Prevention and early curative treatment at a lower level in the delivery system can reduce the impact of these affections. These findings demonstrate that the cost of taking-care of patients in a referral facility is significantly higher than in a basic health center. Thus, there is significant justification for integrating public health activities into the MPA at the PHC village level.

The Expanded Program on Immunisation (EPI) commenced in 1979. Levels of immunisation coverage increased markedly over the decade and by 1995, over 85% of children under 1-yr were fully vaccinated. This was accompanied by a dramatic reduction in the number of cases of immunisable diseases. Despite the high coverage of the EPI program, there are still some pockets of low coverage. Other factors such as wrong immunisations given, high turnover of staff and poor staff attitudes also help explain the sub-90% coverage for under 1-year olds.

The range of services actually delivered at the primary level is adequate and should continue to be delivered in the same way. Additionally, there is a need for continuous education of the communities and the integration of EPI to Key Village activities.

For the secondary level, clear separation should be delineated between the range of services delivered by Minor Health Centres and Major Health Centres. In MiHCs, hospitalisation should be limited to observation and to post deliveries surveillance of less than 48 hours. This kind of bed availability is convenient for patients and avoids an overflow of beds at MaHCs. Reflecting the catchment population of an average MIHC, 2 beds for observation and 2 beds for post deliveries should suffice. However, for MiHCs in remote areas, with difficult access, or in particularly densely populated areas, beds for each category should be doubled. Laboratories should be provided only at the MaHC level, for reasons of cost-effectiveness. However, a limited range of laboratory tests could be provided for MiHCs in isolated areas.

Integrated delivery of health care is another tool against the most widespread diseases in the Gambia. Advice on the prevention of diarrhoeas, equilibrated nutrition, and on breast-feeding should be given during visits of mothers and children for other affections. This preventive care is more easily and naturally done at the MiHC level. Similarly, when a pregnant woman is treated for malaria at the MiHC, she can benefit from prenatal consultation, vaccination status of her children can be verified, and myriad other services rendered to her before departure.

Hospitals should limit their services to specialised and severe cases, referred by lower level facilities. The cost of treating a case is distinctly more expensive in these establishments than in the MiHC. In fact, it could be 10 to 25 times higher. PHC given at the hospital generates functional distortions. Indeed, the prevalence of poor-functioning

hospitals can be directly ascribed to ambulatory service congestion and to excessive burden on laboratories. Pressures exercised by PHC on the hospital facilities also generate distortions at the level of health program development. Attention is directed to hospitals in distress and a misconstrued impression is created that what is required is hospital enlargement as oppose to hospital decongestion by improved performance at lower levels of the pyramid.

To increase the efficiency of the health system, each level of the pyramid should play its role, and only this role. For example, a referral facility should not act as an primary care facility for the city where it is located. If these two different functions are not separated, patients who could be cured at a lower level will overwhelm the higher level facility. This would translate into significant wastage of resources such as trained staff, space, equipment, and so forth. The same applies to distinctions between a MiHC and a PHC Village. While a MaHC and MiHC could be in the same location and share some staff, but time spent by staff in each facility should be clearly defined *a priori*.

Support of the PHC is tantamount to delivery of PHC. If hospitals and MaHCs attempt to be primary and referral facilities, they will provide poor primary care simply because they do not offer a proper setting in which full attention and time is given to the human dimension of individual care. They will also provide bad referral care because physicians will be flooded with primary care work. Moreover, by competing with the MiHC -a competition which the latter cannot win given the resources and prestige of referral facilities– they rob MiHCs of their chance of gaining the credibility required for provision of good quality primary care, thus to lessen the burden on referral facilities.

4.2.3 Improvements proposed

4.2.3.1 Primary level

The minimum package of activities at the level of village-based primary health care should include:

- *Basic preventive care*: management of women in labour by a trained TBA, prophylactics of anaemia and malaria in pregnancy, postnatal care 6 weeks post delivery, baby growth education including promotion of breastfeeding, provision of adequate water supply and sanitation;
- *Basic curative care*: case management of malaria, diarrhoea, ARI, referral of complicated cases, and follow-up of treatment for TB / leprosy;
- *Family Planning*: motivation and distribution of contraceptives including condom, foam and pill;
- *Health education* with emphasis on nutrition, family life, AIDS prevention, environmental sanitation, vaccinations and utilisation of VHS / BHS;
- *Disease surveillance*: tetanus, neonatorum and maternal deaths;
- *Epidemiological surveillance*: malaria, ARI, diarrhoea.

4.2.3.2 Secondary level

The MPA for first stage of the secondary level, minor health centres, should include the following:

- **curative care:**
  - *common diseases*: respiratory infections, diarrhoea, malnutrition, malaria, otitis, conjunctivitis, common cold, intestinal worms, dressing, suture, burns, injuries, skin infections, fever, etc.;
  - *serious cases*: tuberculosis screening, schistosomia, gynaecological infections, severe dehydration, bleeding during pregnancy or delivery, serious cases of malnutrition, etc.;
- **emergencies**
  emergency treatment for injuries, obstructed labours, haemorrhage during deliveries, cerebral malaria, meningitis;
- **chronic cases**
  tuberculosis, hypertension, leprosy, etc.;
- **antenatal care:**
  prevention of diseases during pregnancy, screening of risks and treatment for current diseases; close dialogue and discussion with the family in order to better ascertain delivery conditions and determine referral strategies;
- **post natal care and family planning**
  assistance for deliveries and emergency care for complicated deliveries; immunisation, advice, service and contraceptives for women; syphilis screening;
- **well- baby services**
  immunisation, growth monitoring;
- **IEC**
  all of the above plus on going dialogue; outreach and regular visits with all villages and groups served by the MiHC;
- **public health service**
  environmental and waste collection and disposal;
- **organisation of an effective referral system to MaHC**
  co-manage (with the health committee) funds, drugs, facility maintenance and cleaning; evaluate activities using HIS: coverage, utilisation rate, costs, quality of care, drug prescription, etc.;
- **laboratory (some MiHCs only)**
  biochemistry (blood, urine), microbiology (parasitology, bacteriology and mycology), virology, public health (water pollution, outbreak of communicable diseases) and serology (syphilis screening).

CPA for Major Health Centres

Four main wards should be included in each MaHC: internal medicine, paediatric, obstetric and surgery. For diagnostic activities, laboratory and imaging equipment are required. It is also at this level that dental equipment will be required should be useful not only to extract but also to treat teeth.

◈◈ Outpatient cares

- ***emergencies***:
  traffic accidents, acute dyspnea, coma, intoxication, injuries
- ***Referred patients***

◈ ◈ In-patient cares

- **internal medicine**:
  typhoid, severe cases of malaria, respiratory infections, urinal infection;

- **Paediatric**:
  severe dehydration, severely malnourished children, severe respiratory infections, severe measles, neonatal problems;
- **Obstetric**:
  complicated deliveries / obstructed labours: vacuum extractor, ocytocine infusion, episiotomy, blood or macromolecules infusion;
- **Surgery**
  caesarean section, laparotomy, acute abdomen, hysterectomy, traumatology, injuries, hernia, burns, fracture, shooting, appendectomy;

  ◈◈ **Laboratory examination**
  ◈◈ **Medical Imaging procedures (radiography, ultrasounds)**
  ◈◈ **Blood Transfusion**
  ◈◈ **Dentistry**
  ◈◈ **Pharmacy**

4.2.3.3 Tertiary level

At the third level of services delivery, limited outpatient and inpatient care and support wards are required. However, activities are more specialised that at MiHC level. Specific beds such as psychiatry also need to be provided.

◈◈ Outpatient cares
emergencies and referred patients.

◈ ◈ In-patient cares (referred patients and severe cases)
Internal medicine; Obstetric; Paediatric; Surgery; and Specialities .
◈◈ Laboratory examination
◈◈ Medical Imaging procedures (Radiography, ultrasounds)
◈◈ Blood Transfusion
◈◈ Dentistry
◈◈ Pharmacy

4.3 FACILITIES LOCATION

4.3.1 Current location

The existing distribution of secondary and tertiary level facilities is as follows:

LGA & City Council	DIVISION	LEVEL	FACILITIES	NAME
Banjul	**Western**	III	Hospital	RVH, Banjul
42000	*(Kanifing)*	II	Major Health Centre 2	Faiikunda (KMC)
				Brikama
Kanifing			Minor Health Centre 4	Serekunda (KMC)
341.000	**1 – KMC**			Bwiam
				Gunjur
Brikama	**2 – W**			Bakau (KMC)
307.000			Dispensaries 4	Leman Street (BJL)
				Banjulnding
				Sukuta
T: 690.000				Brufut
		I		36

Mansa kono	**Lower River**	III	Hospital	
71.000	*(Mansa Kono)*	II	Major Health Centre 2	Mansa Konko
			On-going	*Soma*
	3 – LRD		Minor Health Centre 2	Kiang Karantaba
				Bureng
			Dispensaries	Kwinella
		I		25
Kerewan	**North Bank West**	III	Hospital	
185.000	*(Essau)*	II	Major Health Centre	Essau
	4 – NBD		Minor Health Centre	Kuntair
			Dispensaries	Medina Bufuloto
		I		22
	North Bank East	III	Hospital	Farafenni
	(Farafenni)	II	Major Health Centre	
			Minor Health Centre	Kerewan
	NBD		Dispensaries 2	Ngayen Sanial
				Salikenni
		I		19
Kuntaur	**Central River**	III	Hospital	Bansang
	CRD	II	Major Health Centre	Kuntaur
	(Bansang)		Minor Health Centre 2	Kaur
Georgetown				Kudang
	5 – CRDN		Dispensaries 5	Janianbureh
				Brikamaba
175.000	**6 – CRDS**			Sami Karantaba
				Dankunku
				Chamen
		I		47
Basse	**Upper River**	III	Hospital	
185.000	*(Basse)*	II	Major Health Centre	Basse
	7 – URD		Minor Health Centre 2	Fatoto
				Yorobawol
			Dispensaries 3	Gambisarra
				Diabugu
				Baja Kunda
		I		47
Tot: 1.306.000			***Total level I (Treks)***	***196***

LGA: Local government Authority; CC: City Council
(Basse) DHT Location
7 - URD Administrative Division
47 Number of Trekking stations (level 1)

First column:
Cities where local government authority or City Council is located. As Health Division and Administrative division is not always the same, this column includes all government Authority or City Council, but put together in one box as same health division. For example, Banjul, Kanifing and Brikama, are in the same box which composes the Western division. Similarly, Kuntaur and Georgetown are in only one box corresponding to the Central River division.
The number of inhabitants in 1999 is a projected population from the 1993 Population census using division growth rate.

Second column:
This presents the six health divisions. Under the name of each health division is the city where the Division Health Team is actually located. Each box also contains a letter –name code. These codes are division codes used by National census.

Third column: Level of facilities: Primary, Secondary and Tertiary.

Fourth column: Type of facilities

Fifth column:
Name of each facility. For the Western Division, initials have been used after the name of some of the facilities to precise their location.: KMC for Kanifing Municipaly Council and BJL for Banjul Council. These precisions are important because the situation of the Western division is very different from other divisions. Many times, we need to distinguish these 2

municipalities from the rest of the division.
The figure in this column on the line Level I, is the number of Trekking station for each division, which are extensions of secondary level facilities.

The distribution of PHC Villages is as follows:

DIVISION	POPULATION	PHC Village
Western	690 000	127
Lower River	71 000	64
North Bank West	85 000	64
North Bank East	100 000	43
Central River	175 000	89
Upper River	185 000	60
Total	*1 306 000*	*447*

4.3.2 Analysis

Generally, health facilities are well distributed over administrative divisions, although some regions are better served than others. The majority of villages in the Western Division, for example, are PHC villages while only 1 in 6 in other divisions are similarly served. North Bank settlements, especially between NBD and CRD and between CRD and URD, have poorer access both with regard to incidence of facilities and transportation infrastructure.

The western part of Western Division, including Banjul and Kanifing, is different from the rest of the Western division and from the rest of the country also: it is densely populated, exclusively urban, has the greatest growth rate of the country. Numerous private facilities and NGOs are involved in delivering health services.

Major Health Centers:

The breakdown of number of inhabitants by MaHC is as follows:

DIVISION	POPULATION	Number	NAME	Pop./MaHC
Western (H)	690 000	2	Fajikunda (KMC) Brikama	345 000
Lower River	71 000	1	Mansa Konko *Soma*	71 000 35 500
North Bank West	85 000	1	Essau	85 000
North Bank East (H)	100 000			
Central River	175 000	1	Kuntaur	175 000
Upper River (H)	185 000	*1*	Basse	185 000
Total	*1 306 000*	*6*		*217 667*

Without WD, number of inhabitants varies from 1 per 70.000 in LRD to 1 per 185,000 in URD with an average of 1/154,000. If NBDE and NBDW are considered together, the ratio is 1 to 185,000. The ratio in the WD is substantially higher than in other divisions: 1 for 345,000. But a lot of private and NGO facilities are operational in the Division. In LRD, a new facility is being built in Soma. With 2 MaHCs, the ratio will fall to 1: 35,000 in this division.

The demographic profile of community served (1:70,000 to 1:185,000) is generally the one utilised to justify a first-referral facilities that support but do not deliver primary health care to the population through a network of basic health facilities.

Minor Health Center.

The numbers of inhabitants by MiHC is as follows:

DIVISION	**POPULATION**		**NAME**	Pop./MiHC
Western	690 000	4	Serekunda (KMC)	172 500
			Bwiam	
			Gunjur	
			Bakau (KMC)	
Lower River	71 000	2	Kiang Karantaba	35 500
			Bureng	
North Bank West	85 000	1	Kuntair	85 000
North Bank East	100 000	1	Kerewan	100 000
Central River	175 000	2	Kaur	87 500
Upper River	185 000	*2*	Kudang	92 500
			Fatoto	
			Yorobawol	
Total	*1 306 000*	*12*		*108 833*

Without WD, the number of facilities varies from 1 in 35,000 in LRD 1 in 100,000 in NBDE. If NBDE and NBDW are considered together, ratio would be 1 per 92,500 as in URD. Without WD, average coverage is 1 in 77,000.

For Major and Minor Health Centers, LRD is best served and URD worst. However, URD has a hospital, although its activities and functions would differ from a health centre. The WD ratio is substantially higher than other divisions: 1 per 172,500 inhabitants. As mentioned earlier, numerous private and NGO facilities are operational in the area.

Dispensaries

The distribution of dispensaries is as follows:

DIVISION	**POPULATION**		**NAME**	Pop./Dispensary
Western	690 000	4	Leman Street (BJL)	172 500
			Banjulnding	
			Sukuta	
			Brufut	
Lower River	71 000	1	Kwinella	71 000
North Bank West	85 000	1	Medina Bufuloto	85 000
North Bank East	100 000	2	Ngayen Sanjal	
			Salikenni	
Central River	175 000	5	Janjanbureh	35 000
			Brikamaba	
			Sami Karantaba	
			Dankunku	
			Chamen	

Upper River	185 000	*3*	Gambisarra Diabugu Baja Kunda	61 667
Total	*1 306 000*	*16*		*81 625*

Number of dispensaries varies from 1 in 35,000 in CRD to 1 in 85,000 in NBDE, excluding WD. If NBDE and NBDW are considered together, ratio would be 1 in 61,600. Without WD, average coverage is 1 in 51,000.

As MaHCs are quite different from other secondary level facilities, it is useful to consider MiHCs and dispensaries together. Aggregated figures are as follows:

DIVISION	**POPULATION**		Pop per (MiHC+Disp.)
Western	690 000	8	86 250
Lower River	71 000	3	23 667
North Bank West	85 000	2	42 500
North Bank East	100 000	3	33 000
Central River	175 000	7	25 000
Upper River	185 000	*5*	37 000
Total	*1 306 000*	*28*	*46 643*

Without WD, distribution of MiHC plus dispensary varies from 1 in 23,600 in LRD to 1 in 42,500 in NBDW. If NBDE and NBDW are considered together, facility ratio would be 1 in 37,000, same as in URD. Without WD, average is 1 in 31,000. This ratio is too high for the range of services delivered by these kinds of facilities: they generally serve much smaller populations.

Number of inhabitants by PHC village is given in the table below. For the WD, only population living outside of the two municipalities, Kanifing and Banjul, is taken into account.

DIVISION	**POPULATION**	**PHC Village**	Pop./PHC
Western	307 000	127	2 417
Lower River	71 000	64	1 109
North Bank West	85 000	64	1 328
North Bank East	100 000	43	2 326
Central River	175 000	89	1 966
Upper River	185 000	60	3 083
Total	*923 000*	*447*	2 065

The “population per PHC village” ratio varies from 1 in 1,100 to 1 in 2,500.

For proper analysis of the distribution of PHC villages, it would be informative to examine the percentage of villages that are PHC Villages by division. However, that information is not available. As all villages in WD are PHC, and as The Gambia has a total of 2,000 villages, it can be deduced that 1 out of 6 villages in other divisions are PHC villages.

The following paragraph summarises the results of the health services accessibility analysis in the 1998 PER:

> *"The 1993 Household Education and Health Survey of nearly 2,000 households provides important information on access, utilisation and the nature of services that were demanded. Basic Health Services are physically accessible to the majority of the Gambian population, and overall rates of utilisation are relatively high (1.7 outpatient visits per capita per annum). This contrasts with countries in the region where a significant proportion of the population has not accessed services and rates of utilisation are considerably lower (Human Resources Report, July 1994). Access to village health services is reasonable. DoSH figures indicate that, depending on Division, between 70% and 80% of the rural population live within the catchment area of a village health* service.

The 1990 Contraceptive Prevalence Survey measured access two distance and one travel time indicators. It found that 90% of the population lived within 7.5 km of a facility, including Village Health Workers, while 85% of rural dwellers live less than one-hour travel time from a facility. The proportion in urban areas within these limits is nearly 100%. The 1993 HEHS data portrays a similar picture of good access. It established that the average time taken to reach a health facility was thirty minutes nationwide. Differences among Divisions mean that this is worse in some areas: residents of URD and LRD take, on average; four times as long reach a facility as a Banjul resident, and the poorest households within these Divisions are often further located from facilities.

Mean travel time in minutes to a health facility by persons who had a consultation, by division

	Banjul	KMC	WD	NBD	LRD	MID	URD	Total
Travel time	10.5	20	25	32	40	34	47	30

Source: 1993-4 Household Education and Health Survey Report

Note: The survey measures time to and from a facility. The above table divides this figure in half to estimate the time taken to travel one way only.

Although access to primary services is reasonably good compared to countries in the sub region, the time taken for 50% of the population of URD and LRD to reach a health facility may be excessive. High maternal mortality rates coupled with a shortage of public or private transportation suggest that physical access to facilities might be difficult for some population groups."

4.3.3 Improvements proposed

Proposals for improving the distribution of infrastructure are based on the following guidelines:

- 1 MaHC per Division;
- a network of MiHCs in each division;
- extension of PHC villages.

4.3.3.1 General criteria for location

Major Health Centre

The criteria for locating MaHC locations should be:

- same location as local authority offices;

- equal access time for the population (that is, the approximate geographic centre of area in terms of travel time);
- population catchment of about 150,000 for non-exclusive urban division;

The proposal for 1 MaHC per Division generally satisfies these criteria.

Integrated Health Center

For MiHCs, locational factors should include:

- population served: 15,000 (20,000 for very densely populated areas)
- population living within the first 5 km: 5,000
- minimum distance between two facilities: 15 km (maximum distance could be 35km)
- accessibility: road open all year long
- urban attraction: town with at least 2 public amenities e.g. market, primary school, post office, etc.;
- facilities: drinking water, electric power.

Utilisation rates for health services in settlements also need to be taken into account. In addition, while better accessibility and private facilities may diffuse urban demand for government-provided services, the special problems of the urban poor should be taken into account.

PHC Villages

PHC villages should be applied to:

- villages with populations of 400;
- settlements located in remote areas;
- maximum distance that a patient should cover to reach a PHC village is 5 km;
- maximum walking time for a patient to reach a PHC village should be 2 hours.

4.3.3.2 Total facilities proposed by division

Recommendations proposed for each Division derive from the revised health pyramid and reflect the current location of BHS. Location of facilities should be reviewed after the GIS database is created and operationalised through the DoSH. Moreover, the target of 1 MiHC for every 15,000 inhabitants could be attained in one or several phases, depending on available funding. A 10-year implementation period is proposed.

4.3.3.2.1 Western Division

It is proposed that –as with other sectors—Banjul and Kanifing Municipalities be considered a health administrative division separate from Western itself. The new division will remain the most populated of The Gambia housing about 60% of total population in 2009. According to stated guidelines, 40 MiHCs will be required in the division. As numerous private facilities are located in the area, the DoSH should make an inventory of all active facilities. A comprehensive study of the area should be conducted to determine appropriate solutions, possibly in partnership with the private sector. It is expected that NGOs and private sector could operate about half of the required 40 facilities. Thus, the DoSH should only build additional facilities needed to reach the 1 in 20,000 inhabitants ratio, factoring in population ability and willingness to pay.

In Western Division, without KMC and BCC, the MaHC should be in Brikama. Because of the current population of the division area (307,000) and projected numbers by year

2009 (603,000) a second MaHC should be provided. A facility with similar range of services as a MaHC is presently being constructed in Bwiam. This could be the second MaHC although its location is not ideal: only 50,000 inhabitants will live in its catchment area by year 2009.

30 MiHCs will be required to cover the projected 2009 population. In the BCC/KMC area, NGOs and private sector could provide up to 15 of the MiHCs required. In public sector, 6 out of 15 MiHCs could be located in Brikama, Bwiam, Gunjur, BanjulNding, and Sukuta, Brufut, settlements which already have health services infrastructure.

4.3.3.2.2 Lower River Division

This division is the smallest in the Gambia. Population-wise, it does not have enough inhabitants to be eligible for a MaHC. However, other criteria require that a MaHC be located in Soma. It is not the city where the DHT is located –Mansa Konko-- but is sufficiently close at less than 5 km. Moreover, construction of a new facility is nearing completion. 4 of the required 6 MiHCs should be located at Mansa Konko, Kwinella, Kiang Karantaba and Bureng, which already have health services infrastructure and are situated in different administrative districts.

4.3.3.2.3 North Bank Division (West and East)

North Bank Divisions West and East should be merged. Only one DHT should run this division. The MaHC should be in Kerewan. 17 MiHCs should be located in this division. 5 out of its 6 districts already have basic health facility so that the first 6 MiHCs in NBD should be in Essau, Kuntair, Medina Bufaloto, Ngayen Sanjal, Salikenni and Farafenni. The division also has a referral hospital in Farafenni.

4.3.3.2.4 Central River Division

This Division has a referral hospital in Bansang. Consequently, the MaHC should be located in Kuntaur where a local authority is located and which is the geographical mid-point of the Division.

14 MiHCs should be provided: 7 of them in towns that already have basic health services. These towns are located in different administrative districts. Theoretically, the DHT should move to Kuntaur. However, due to local accessibility problems in the NB, it could stay in Bansang.

4.3.3.2.5 Upper River Division

The MaHC for the URD should be located in Basse. 17 MiHCs should be commissioned, 5 of them in the Basic Health Services towns, i.e. at least one in each of the 4 districts. Due to special accessibility problems, Yoro Bawol should have an upgraded MiHC that includes theatre, laboratory and inpatient services.

4.3.3.3 Summary of proposed facilities by categories and division

The table below summarises the health facilities proposed by category of facility and division. The existing 3 major hospitals are designated referral hospitals for 5 divisions

and 2 municipalities. These facilities are already operational. No specific criteria for geographic or population catchment areas is applied.

For the MaHC, at least 1 facility is required for each administrative division. The catchment population per facility is about 150,000. A significant portion of the demand for health services in BCC and KMC is met by private clinics. Thus, the second and third MaHCs can be omitted.

For MiHCs, 1 facility per single or multiple district is required depending on population and access. The catchment population per facility is 15,000 for rural areas and 20,000 for urban (densely populated) areas.

Type of facilities	BCC	KMC	WD	LRD	NBD	CRD	URD	Total
1993 Census	42 326	228 214	234 917	65 146	156 462	156 021	155 059	1 038 145
2009 Projected	39 679	769 362	603 747	83 638	259 766	217 430	257 057	2 230 679
Referral Hospital	No requirement criteria applied							
	RVH				Farafenni	Bansang		3
Total MAHC	3		2	1	1	1	1	9
Facilities under		Serrekunda	Bwiam	Soma				3
New facilities			Brikama		Kerewan	Kuntaur	Basse	
Net New MAHC	*0***		*1*	*0*	*1*	*1*	*1*	*4*
Total MIHC	40		30	6	17	14	17	124
Existing facilities								
		Fajikunda	Brikama	Mansa Konko	Essau	Kuntaur	Basse	
					Farafenni			
Total MHC		1	1	1	2	1	1	7
		Serrekunda	Gunjur	K'Karantaba	Kuntair	Kaur	Fatoto	
		Bakau	Bwiam	Bureng	Kerewan	Kudang	Yorobawol	
Total MiHC		2	2	2	2	2	2	12
	Leman St.		Banjul Nding	Kwinella	Medina	Janjangbure	Gambisara	
	RVH Polyclinic		Sukuta		Ngayen Sanjal	Brikamaba	Diabugu	
			Brufut		Salikenni	Sami	Baja Kunda	
						Dankunku		
						Chamen		
Total Disp	2		3	1	3	5	3	17
Total existing	5		6	4	7	8	6	36
Total new facilities	35		24	2	10	6	11	88
Impact of other	20		15					35
Net New MIHC	*15*		*9*	*2*	*10*	*6*	*11*	*53*

* Major Health Centres at Basse, Kuntaur and Brikama do not have sufficiently large site for required upgrading to MaHCs: thus new facilities are required while existing MHC structures will be downgraded to serve as MIHC

** Other 2 required MaHCs are omitted due to prevalence of private and NGO facilities in the KMC/BCC region

(1)" Required - existing. Based on population criteria.

"(2)" Takes account of non-government health sector partners. Half MiHC run by private sector in BCC/KMC/WD

4.3.3.4 Location of facilities in each division

The exact location of MiHCs requires consideration of population as well as analysis of level and scope of activities in existing facilities. This should then be combined with future projections of epidemiological conditions of each district based on a comprehensive and reliable health information system. Unfortunately, such a system does not exist as yet in The Gambia. Global data is available, but this is insufficient for determining facilities location. A snap survey of BHS facilities was conducted as part of this exercise. However, results insufficiently significant for use in current study. Data that is collected for specific health programs is not used for decision-making and no feedback loop exists from data collectors.[1]

Hospital data is particularly difficult to access: the 3 hospitals are semi-autonomous with internal records offices. Collected data is not sent to the DoSH and is not easily accessed by non-hospital personnel. Generally, then, the current information system does not allow a reliable analysis of operations at the level of BHS or future MiHCs.

The GIS database prepared as part of the current study is a useful tool with which to finalise facility locations. Information on existing facilities is stored in a relational database and presented in tables that are printable and exportable to a spreadsheet. The programme also permits assessment of MiHC catchment areas and details PHC villages by size and level of accessibility.

However, the program is not a planning tool, nor does it propose geographical criteria for locating facilities. From the experience accrued from the conduct of similar exercises in the sub-region, the development of such a program requires a pre-existing health management and information system, and intensive studies of several months duration along with the creation of national working groups. The programme developed as part of this exercise represents an important first step in the creation of a more sophisticated decision-making tool.

4.3.3.4.1 Facilities Beds location

Analyses of the number and distribution of beds was conducted in the following sequence.

First, the concept of “bed” was clarified. It is a bed if available to the patient for more than 48h for diagnoses, treatment, and care. Beds used only for patient observation and simple deliveries are not included in the above definition.

The number of public beds was assessed during field surveys through interviews with DHTs and facility administrators. However, detailed information on number of beds per ward in public hospitals could not be obtained.

There are numerous private medical facilities in the greater Banjul area. However, beds are not registered in DoSH documents. The PER provides some figures although it is

[1] In its comments on the draft final report, PHPNP raised the issue of recommending specific districts for location of new facilities proposed. The Consultants’ detailed response is provided in annex G (volume 2) of the final report.

quite likely that it over-estimates the "Other" category for beds. This was found to be the case in a survey conducted for this study where the «Other» category was overestimated by the inclusion of observation and deliveries beds (i.e. beds for 24 to 48 hours). It was also not possible to obtain reliable information on bed days, ALOS, etc., from BHS. The ALOS indications provided were the averaged length of stays based on experience.

Current Situation

The bed distribution table below documents an average ratio of 1 bed per 855 inhabitants. There is a great deal of variation among between divisions: from 1 per 723 to 1 per 2,800. NBE has 1 bed for every 758 inhabitants; LRD has 1 for 1651; and CRD is the worst served with 1 bed per 2803 inhabitants.

Current (Global)		**Public**			**Private**			
DIVISION	**POPULATION**	**Hop**	**MHC**	**Other**	**Hop**	**Other**	**Total**	**Pop/Beds**
Western	690 000	626	107	0	143	79	955	***723***
Lower River	71 000		23	0		20	43	***1 651***
North Bank West	85 000		40	15		55	110	***773***
North Bank East	100 000	108	4	0		20	132	***758***
Central River	175 000	149	22	50			221	***792***
Upper River	185 000		29	37			66	***2 803***
Total	*1 306 000*	883	225	102	143	174	1 527	***855***
Pop/Beds		***1 479***	***5 804***	***12 804***	***9 133***	***7 506***	***855***	

Source: Mission survey, DoSH and PER.

If the BMC / KMC area is excluded, and if NBE and NBW are grouped together, ratios varying from 1:764 to 1:2800 habitants are derived, with a national average of 1:1304. Conditions in WD worsen considerably: from 1:723 to 1: 2,257

Current (Without BMC & KMC)		**Public**			**Private**			
DIVISION	**POPULATION**	**Hop**	**MHC**	**Other**	**Hop**	**Other**	**Total**	**Pop/Beds**
Western	307 000		57	0		79	136	***2 257***
Lower River	71 000		23	0		20	43	***1 651***
North Bank	185 000	108	44	15		75	242	***764***
Central River	175 000	149	22	50			221	***792***
Upper River	185 000		29	37			66	***2 803***
Total	*923 000*		175	102		174	708	***1 304***
Pop/Beds			***7 463***	***12 804***		***7 506***		

Several major facilities are under construction. These new beds will total 540:

Anticipated	**Distribution**	
540	Bwiam	120
	Serekunda	120
	Paediatric BJL	300

Because of the range of services to be delivered in these new facilities, Bwiam and Serekunda facilities are considered MaHCs and the Paediatric facility a hospital. If these

future beds are included, new ratios will be as follows: total hospital beds will increase by 30%, and total beds (all facilities and sectors) will increase by 35%. Overall, the national ratio will improve by 25%, to 1 bed per 632 inhabitants. However, only WD will benefit from these new beds. The WD ratio will fall from 1 in 723 to 1 in 462, while the ratio in other divisions will remain the same. Thus, the existing gap between WD and the rest of the country will increase.

The DoSH objective should be to decrease the inequalities between the divisions in order to establish parity among the different regions of the country. The objective should also be to achieve a ratio close to the WHO-recommended 1 in 1,000.

New total (With Bwiam & Serekunda)								
		Public			**Private**			
DIVISION	**POPULATION**	**Hop**	**MHC**	**Other**	**Hop**	**Other**	**Total**	**Pop/Beds**
Western	690 000	626	347	0	143	79	1 195	***577***
Lower River	71 000		23	0		20	43	***1 651***
North Bank	185 000	108	44	15		75	242	***764***
Central River	175 000	149	22	50			221	***792***
Upper River	185 000		29	37			66	***2 803***
Total	*1 306 000*	883	465	102	143	174	1 767	***739***
Pop/Beds		***1 479***	***2 809***	***12 804***	***9 133***	***7 506***	***739***	

New total (With Bwiam, Serekunda, Paediatrics)								
		Public			**Private**			
DIVISION	**POPULATION**	**Hop**	**MHC**	**Other**	**Hop**	**Other**	**Total**	**Pop/Beds**
Western	690 000	926	347	0	143	79	1 495	***462***
Lower River	71 000		23	0		20	43	***1 651***
North Bank	185 000	108	44	15		75	242	***764***
Central River	175 000	149	22	50			221	***792***
Upper River	185 000		29	37			66	***2 803***
Total	*1 306 000*	1183	465	102	143	174	2 067	***632***
Pop/Beds		***1 104***	***2 809***	***12 804***	***9 133***	***7 506***	***632***	

Along those lines, proposed bed distribution is summarised as follows:

Proposal		**Public**		**Private**			
DIVISION	**2009 POPULATION**	**Hop**	**Bed I**	**Hop**	**Other**	**Total**	**Pop/Beds**
Western	1 410 000	685	405	374	79	1 543	***914***
Lower River	83 600		20		20	40	***2 090***
North Bank	260 000	75	101		75	251	***1 036***
Central River	217 000	132	110			242	***897***
Upper River	257 000		154			154	***1 669***
Total	*2 227 600*	892	790	374	174	2 230	***999***
Pop/Beds		***1 464***	***1 653***	***3 492***	***7 506***	***999***	

The national average is about 1 to 1000 and the gap between the divisions is reduced. Ratios range from 1 to 900 to 1 to 2000. As the population in LRD is small, 30 more beds in Soma would lower the ratio of LRD to 1 per 1000. In this case, the ratio between the highest and lowest would be halved: 1.77 (1600 / 900) instead of 3.9 (2800 / 720).

Proposal for distribution

Schedule of investments is based on a 10-year cycle. By 2009, population projected will be 2,230,000. The international norm is 1 bed /1000 inhabitants. Thus, a total of 2,230 beds should be distributed among facilities.

In the health pyramid, a distinction is made between MaHCs and hospitals: these represent 2 different levels of referrals. Hospitals treat patients that cannot be treated at MaHC level due to limited staff expertise or unavailable equipment. Moreover, the RVH is different from the 2 other hospitals and may be viewed as the national referral hospital.

Differentiation among facilities leads to a corollary implication that beds also may not be of the same types. It is, in fact, necessary to distinguish among 3 levels of beds:

- Beds of level I are those that correspond to services given in a MaHC. These are beds for first reference patients who need to be hospitalised and cannot be treated by ambulatory care;
- Beds of level II are those that correspond to services given in referral hospitals with regional coverage: Bansang and Farafenni.
- Beds of level III are for patients at the level of the national hospital, the RVH.

In effective health systems, distribution of hospital beds between these 3 levels is:

- 60% of beds of level I
- 30% of beds of level II
- 10% of beds of level III

The 2,230 beds required in year 2009 should be distributed as follows:

	%	Number
Beds I	60	1338
Beds II	30	669
Beds III	10	223
Total	100	2230

It is unlikely that referral facilities can be reserved exclusively for one level of beds. Patients in close proximity to these facilities should be able to access facility for care more typically associated with lower level of beds. Thus, the RVH will have beds III mainly, but will also have beds II and I for its urban catchment area. Similarly, Bansang and Farafenni Hospitals will have beds II, but should be positioned to treat bed I type ailments for patients in their localities.

The following are catchment areas are defined with due cognisance to access barriers.

Catchment area of reference hospitals for beds II (from the administrative districts):

RVH	**Bansang**	**Farafenni**
Jokadu	Sandu	Kiang Central
Upper Niumi	Wuli	Kiang East
Lower Niumi	Kantora	Kiang West
Banjul	Fulladu East	Jarra West

Kanifing	Nianija	Jarra Central
Kombo North	Niani	Jarra East
Kombo South	Sami	Upper Saloum
Kombo Central	Fulladu West	Lower Saloum
Kombo East	Niamina East	Upper Baddibu
Foni Brefet	Niamina West	Central Baddibu
Foni Bintang-Karenai	Niamina Dankunku	Lower Baddibu
Foni Kansala	McCarthy Island	
Foni Bondali		
Foni Jarrol		

The proportional break down of total 2009 population by referral hospitals is as follows:

Hospitals	Population	%
RVH	1,540,779	69
Farafenni	248,766	11
Bansang	441,134	20
Total	2,230,679	100

Details of numbers of inhabitants by district covered by each hospital are attached in the appendix.

Type II beds should be distributed among the 3 hospitals by size of the catchment population as follows:

Hospitals	%	Number of beds
RVH	69	463
Farafenni	11	75
Bansang	20	132
Total	100	669

Catchment area of referral facilities for beds I (from the administrative districts)

Similarly, type I beds should be shared among MaHCs and hospitals. In WD, it will be necessary to take account of the supplementary MaHC under construction in Bwiam.

For determining catchment area, each administrative district is connected to one referral establishment. This rationale was discussed with the DoSH during the interim report meeting.

In order to rationalise the health sector and for better management of services, it is proposed that the NBDE and NBDWS are merged into one division, as for other administrative services. The location of the MaHC and the DHT should be in Kerewan. There is some opposition to this proposal because of divide between NBDE and NBDW. Also, there is perception that patients from Essau would prefer to cross by ferry to RVH, rather than going to Kerewan.

It is noted that a bridge is under construction in the NBD. While another 1 or so may be required for completion, the medium term scenario would appear to favour the merger. However, both scenarios are utilised in calculating numbers of beds.

	District	Division	2009	% Pop	Nber
MAHC					
Brikama	Foni Brefet	WD	11 752		
Brikama	Kombo Central	WD	148 948		
Brikama	Kombo East	WD	36 187		
Brikama	Kombo North	WD	299 886		
Brikama	Kombo South	WD	73 726		
	Brikama catchment area:		**570 499**	26%	**342**
Mansa Konko	Jarra Central	LRD	7 592		
Mansa Konko	Jarra East	LRD	13 935		
Mansa Konko	Jarra West	LRD	28 783		
Mansa Konko	Kiang Central	LRD	8 849		
Mansa Konko	Kiang East	LRD	7 548		
	Mansa Konko catchment area:		**66 706**	3%	**40**
Kuntaur	Niani	CRD	23 686		
Kuntaur	Nianija	CRD	9 148		
Kuntaur	Sami	CRD	20 544		
	Kuntaur catchment area:		**53 378**	2%	**32**
Basse	Fulladu East	URD	143 817		
Basse	Kantora	URD	50 293		
Basse	Sandu	URD	19 222		
Basse	Wuli	URD	43 725		
	Basse catchment area:		**257 057**	12%	**154**
Kerewan	Central Baddibu	NBD	21 435		
Kerewan	Jokadu	NBD	28 834		
Kerewan	Lower Baddibu	NBD	19 272		
Kerewan	Lower Niumi	NBD	63 055		
Kerewan	Upper Niumi	NBD	36 102		
	Kerewan catchment area:		**168 698**	8%	**101**

2 supplementary MaHCs should be considered: Serrekunda, which is being designed; and Bwiam, which is being constructed.

MAHC sup.					
Serekunda	Kanifing	KMC	769 362		
	Kanifing catchment area:		**769 362**	34%	**462**
Bwiam	Foni Bintang-Karenai	WD	12 377		
Bwiam	Foni Bondali	WD	6 232		
Bwiam	Foni Jarrol	WD	6 110		
Bwiam	Foni Kansala	WD	8 528		
Bwiam	Kiang West	LRD	16 931		
	Bwiam catchment area:		**50 179**	2%	**30**

Finally, the 3 hospitals have also a catchment area for type 1 beds for local populations.

Hospital					
RVH	Banjul	BCC	39 679		
	RVH catchment area:		**39 679**	2%	**24**
Farafenni	Lower Saloum	CRD	16 611		
	Upper Baddibu	NBD	91 068		
	Upper Saloum	CRD	16 742		
	Farafenni catchment area:		**124 421**	6%	**75**

Bansang	Fulladu West	CRD	90 416		
	McCarthy Island	CRD	2 470		
	Niamina Dankunku	CRD	8 993		
	Niamina East	CRD	21 527		
	Niamina West	CRD	7 293		
	Bansang catchment area:		**130 699**	6%	**78**

In summary, beds I distribution will be as follows:

	Division	**2009**	**% Pop**	**Nber**
MaHC				
Brikama	WD	**570 499**	26%	**342**
Mansa Konko	LRD	**66 706**	3%	**40**
Kuntaur	CRD	**53 378**	2%	**32**
Basse	URD	**257 057**	12%	**154**
Kerewan	NBD	**168 698**	8%	**101**
MaHC sup.				
Serrekunda	Kanifing	**769 362**	34%	**462**
Bwiam	WD/LRD	**50 179**	2%	**30**
Hospital				
RVH	BCC	**39 679**	2%	**24**
Farafenni	CRD/NBD	**124 421**	6%	**75**
Bansang	CRD	**130 699**	6%	**78**
Total		**2 230 679**	100%	**1338**

If 2 divisions are retained in NB, the 5 districts covered by Kerewan should be distributed between Essau and Farafenni. The number of beds in Farafenni should increase from 75 to 99, and the Essau MaHC should have 77 beds. Distribution will be as follows:

	District	**Division**	**2009**	**% Pop**	**Nber**
Essau	Jokadu	NBD	28 834		
Essau	Lower Niumi	NBD	63 055		
Essau	Upper Niumi	NBD	36 102		
	Essau catchment area:		**127 991**	6%	**77**

	District	**Division**	**2009**	**% Pop**	**Nber**
Farafenni	Lower Saloum	CRD	16 611		
Farafenni	Upper Baddibu	NBD	91 068		
Farafenni	Upper Saloum	CRD	16 742		
	Central Baddibu	NBD	21 435		
	Lower Baddibu	NBD	19 272		
	Farafenni catchment area:		**165 128**	7%	**99**

The overall distribution for the whole country will be :

	Division	**2009**	**% Pop**	**Nber**
MAHC				
Brikama	WD	**570 499**	26%	**342**
Mansa Konko	LRD	**66 706**	3%	**40**
Kuntaur	CRD	**53 378**	2%	**32**
Basse	URD	**257 057**	12%	**154**
Essau	NBD	**127 991**	6%	**77**
MAHC sup.				

Serrekunda	Kanifing	**769 362**	34%	**462**
Bwiam	WD/LRD	**50 179**	2%	**30**
Hospital				
RVH	BCC	**39 679**	2%	**24**
Farafenni	CRD/NBD	**165 128**	7%	**99**
Bansang	CRD	**130 699**	6%	**78**
Total		**2 230 679**	100%	**1338**

In summary, beds should be distributed according to levels of beds and categories of establishments, and depending on whether NBD East and West are separated or merged.

Beds distribution (NBD)

	III	**II**	**I**	**Total**
RVH	223	462	24	709
Farafenni		75	***75***	149
Bansang		132	78	211
MAHC			***1 162***	1 162
Total	223	669	1 338	2 231

Beds distribution (NBDE and NBDW)

	III	**II**	**I**	**Total**
RVH	223	462	24	709
Farafenni	-	75	***99***	174
Bansang	-	132	78	211
MAHC	-	-	***1 137***	1 137
Total	223	669	1 338	2 231

Other adjustments must be made to account for beds in the private sector. These beds are in the level I category. Subject to confirming the existence of these beds (as hospitalisation rather than observation beds) and in the absence of new private facilities over the next 10 years, data would be as follows:

With NB only:

		Beds		
	Division	**Required**	**Private**	**Adjusted**
MAHC				
Brikama	WD	342	222	120 (1)
Mansa Konko	LRD	40	20	20
Kuntaur	CRD	32		32
Basse	URD	154		154
Kerewan	NBD	101	75	26
MAHC sup.				
Serekunda	Kanifing	462		462 (1)
Bwiam	WD/LRD	30		30
Hospital				
RVH	BCC	24		24
Farafenni	CRD/NBD	75		75
Bansang	CRD	78		78
Total		1338		1338

With NBED and NBWD:

		Beds		
	Division	**Required**	**Private**	**Adjusted**
MAHC				
Brikama	WD	342	222	120 (1)
Mansa Konko	LRD	40	20	20
Kuntaur	CRD	32		32
Basse	URD	154		154
Esau	NBD	77	55	22
MaHC sup.				
Serekunda	Kanifing	462		462 (1)
Bwiam	WD/LRD	30		30
Hospital				
RVH	BCC	24		24
Farafenni	CRD/NBD	75	20	55
Bansang	CRD	78		78
Total		1338		1338

(1) indicative numbers. A special survey is indispensable for these sites.

A supplementary survey is indispensable for the Banjul, Kanifing, and Kombo North areas which houses 60% of the population in a densely populated zone. Presently, the majority of private facilities are located here, and partnerships with such establishments would make an effective strategy for further development of the sector. Alternatives to hospitalisation, such as development of ambulatory care, should be also explored. Calculations presented do not necessarily require construction of a 400-bed hospital or referral centre in Serekunda. Rather, they highlight the importance of conducting an in-depth survey in this zone. Tentatively, it can be anticipated that the 462 beds required in the Kanifing Municipality could be evenly split between private and public sectors.

A final adjustment is necessary in URD. Considering the particular location of Yoro bawol, the DoSH has decided that beds should be introduce. In this case, the number of beds planned for Basse should be reduced. This reduction should be proportional to the population covered by each of the 2 facilities.

		Population			
	District	**Per district**	**Total**	**%**	**Beds**
Basse	Fulladu East	70 780	113 487	72%	***114***
	Kantora	42 707			
Yoro Bawol	Sandu	18 546	44 142	28%	***40***
	Wuli	25 596			
Total		157 629	157 629	100%	***154***

The final proposal by facilities and all categories of beds is as follows :

With NB only:

		Beds I			**Total Bed**
MaHC	Division	Required	Private	Adjusted	**Required**
Brikama	WD	342	222	120 (1)	**120 (1)**
Mansa Konko	LRD	40	20	20	**20**
Kuntaur	CRD	32		32	**30**
Basse	URD	114		114	**115**
Yoro Bawol	URD	40		40	**40**
Kerewan	NBD	101	75	26	**30**
MAHC sup.					

Serrekunda	Kanifing	462		462 (1)	**230 (1)**
Bwiam	WD/LRD	30		30	**30**
Hospital					
RVH	BCC	24		24	**710**
Farafenni	CRD/NBD	75		75	**150**
Bansang	CRD	78		78	**210**
Total		1338		1338	**1685**

With NBED and NBWD:

		Beds			**Total Bed Required**
	Division	Required	Private	Adjusted	
MAHC					
Brikama	WD	342	222	120 (1)	**120 (1)**
Mansa Konko	LRD	40	20	20	**20**
Kuntaur	CRD	32		32	**30**
Basse	URD	114		114	**115**
Yoro Bawol	URD	40		40	**40**
Esau	NBD	77	55	22	**20**
MAHC sup.					
Serrekunda	Kanifing	462		462 (1)	**230 (1)**
Bwiam	WD/LRD	30		30	**30**
Hospital					
RVH	BCC	24		24	**710**
Farafenni	CRD/NBD	75	20	55	**160**
Bansang	CRD	78		78	**210**
Total		1338		1338	**1685**

(1) indicative numbers. A special survey is indispensable for these sites..

4.4 WASTE MANAGEMENT

4.4.1 Generally

Waste disposal must be seen as part of a larger process: the life cycle of resources initiated at harvesting or mining and extending onto the product's end of life. As with all social systems, it aims at being self-organising with minimal impact on its environment.

4.4.2 Health care waste

The management of health care waste involves storage, transport, handling, and disposal of waste materials as hygienically and economically as possible, with minimum risk to health and environment.

Health care waste can be divided into 8 categories:

- General waste
- Pathological waste
- Radioactive waste
- Chemical waste
- (Potentially) infectious waste

- Sharps
- Pharmaceutical waste
- Pressurized containers

Note: Some of these occur in liquid, gaseous and/or solid form.

Any of these can be present at a wide range of health care establishments, though not all types of waste occur at all facilities all the time. In general there is insufficient awareness of the health hazards associated with contaminated or infectious waste. To minimise such risks for personnel, patients and visitors, adequate occupational health programmes should be incorporated into operations policy and institutional culture. Benefits from structural measures will be impaired if day-to-day operations do not follow prescribed guidelines.

In addition to health risks within the establishment, consideration must be given to the impact of health care waste on the environment outside the facility. To this end, waste should be segregated and concentrated within health care establishments to simplify its management and whenever feasible, waste should be recycled so that it does not enter the waste stream requiring disposal.

4.4.3 Waste handling, storage and transport

4.4.3.1 Segregation and storage

General waste should be recycled where feasible: paper, glass, metal and plastics may have some sales value depending on local conditions. Non-infected food could be used for animal feed or can be composted with other garden waste for use on facility grounds. All waste containers should be leak proof and protected against scavengers such as rodents, dogs, and people.

Sharps should be packed in puncture-proof, combustible containers.

Pathological and infectious waste must be segregated. High-risk infectious waste should be autoclaved, preferably at source. Non-infectious blood may be poured down the drain if flushed with large amounts of water.

Pressurised containers must be separated from waste prior to incineration.

All solid waste to be segregated should be put into single-use, moisture-proof bags, hung in special holders or used as liners for plastic or metal containers. The bags should be strong enough to resist mechanical damage. Colour-coded bags or containers should be used to identify pathological and infectious waste, and appropriately labelled with symbols. The containers must be sealed before transportation, and should be compatible with intended method of treatment or disposal.

Radioactive waste should be labelled and can be securely stored to allow decay.

4.4.3.2 Transport

The movement and transport of waste should be viewed as part of a comprehensive waste management system. Internally, within facilities, waste should be transported on trolleys or handcarts that are only used for this purpose. Such equipment must be cleaned regularly and disinfected as required.

External transportation of waste must present no health risk. When hazardous waste is being transported, the contents of all containers and their potential hazard must be identified in documents carried in the vehicle. Transport vehicle should have a fully sealed body cleaned and disinfected after each use or as necessary.

The GOTG has passed a Hazardous Waste Act and is in the process of finalising the Hazardous Waste and Dangerous Materials Regulations toward controlling classification, storage and transportation of such materials. Copies are available from the NEA.

4.4.4 Chemical waste

The handling, storage, and transport of chemical waste require special measures use of which is reduced by:

- Reduced use of chemicals;
- Keeping chemical inventories low;
- Substituting non-hazardous chemicals for hazardous ones whenever possible.

Non-hazardous chemical waste can be disposed of along with general waste or otherwise recycled. Hazardous chemical waste must be recycled when possible, failing which it should be segregated by type of hazard and the appropriate treatment and disposal methods applied. Secure storage areas are to be provided for various types of waste: toxic, flammable, explosive, reactive, etc., according to applicable laws.

Where local quantities are small, development of a regional collection and disposal system may be considered as safe and economic. It is advisable for all types of health facilities and hospitals in particular to seek expert opinion on strategies for hazardous waste management.

4.4.5 Waste treatment and disposal methods

In determining suitable treatment and disposal methods, account should be taken of all existing local options and plans provided for emergencies.

4.4.5.1 Kitchen and garden waste

Non-infectious kitchen waste can be fed to animals kept near the facility. Alternatively it can be composted on-site together with garden waste, and the compost used as fertiliser on the grounds.

Food waste from tuberculosis or similar treatment areas should be autoclaved before disposal.

4.4.5.2 General waste

General waste should be segregated as necessary to suit local recycling practices. General waste that cannot be recycled should be disposed of along with municipal waste.

4.4.5.3 Pathological waste

Treat and dispose by sterilisation, incineration or burial. Incineration is preferred but this requires incinerators specially designed to deal with pathological waste which are not provided at the health centres. Burial is typically on municipal burial grounds.

4.4.5.4 Infectious waste

Infectious waste is to be incinerated. Autoclaving before incineration is not required provided the waste is properly packed and handled.

4.4.5.5 Sharps

Sharps are to be packed in puncture proof and combustible containers for incineration.

4.4.5.6 Pharmaceutical waste

All unwanted pharmaceuticals must be returned to central medical stores which will determine the most suitable method of disposal. Returned pharmaceuticals are to be properly packed and labelled as outdated pharmaceuticals.

4.4.5.7 Pressurised containers

These may be considered part of general waste albeit not for incineration (if general waste is).

4.4.5.8 Aqueous and other liquid waste

Waste water and other liquid waste should be sampled for contaminants, including heavy metals, organic solvents and pH value, all which may affect treatment plants. Appropriate treatment should be provided at point of discharge. This requires specific treatment depending on the equipment and procedures that give rise to contamination. Information on treatment required generally forms part of technical data for equipment.

Black water disposal consists of toilet water. This water must be drained into a septic tank, which is emptied annually. Black water is relabelled grey water after it passes through septic tank. Kitchen drainage systems require grease traps which also convert black to grey water.

Grey water is all used water other than rain, greasy or black water. Grey water is channelled into the municipal sewer or one or more soakaways.

Rainwater should be drained from the site in open storm water drains, collected, and drained into a public watercourse or soakaway at least 30 metres from any grey water soakaway to avoid flooding of the latter after heavy showers.

4.4.5.9 Chemical waste

Chemical waste must be treated and disposed of according to applicable laws and regulations as available from the National Environment Agency. In any case, they must be treated and handled in compliance with manufacturers' instructions. Non-hazardous chemical waste may be disposed of along with general waste. Special measures are necessary for treatment and disposal of hazardous chemical waste. Recycling will serve to:

- Return unused chemicals;
- Redistill solvents;
- Reuse hazardous flammable organic solvents as fuel;
- Recycle chromic acid;
- Recycle metallic mercury;
- Recover silver from photographic developing solutions;
- Recover reusable materials in discarded batteries;
- Recover waste oil for use as fuel.

Special attention is drawn to treatment and disposal issues in case of:

- Reactive waste;
- Flammable waste;
- Toxic waste;
- Waste scintillation media;
- Cytotoxic and genotoxic drugs and waste contaminated by these drugs;
- Waste containing asbestos;
- Detergents, solvents, PCB's, and insecticides.

In the above cases, treatment and disposal has to be according to the applicable laws and regulations or conform to manufacturer instructions. It is advisable to consult professional expertise such as in chemistry waste management.

4.4.5.10 Radioactive waste

The type, form and level of radioactive material used in medical facilities mostly results in low-level radioactive waste, i.e. under 1 MBq (megabecquerel). The activity range used in the application of radio-iodine is nearly 1GBq, but these sources do not routinely generate radioactive waste.

Despite the widespread use, specialised commercial or central government waste disposal services are rarely necessary. With proper handling, all waste generated can be disposed of through normal channels.

4.4.6 Concentration and storage

By far the most widely used method for solid waste is storage pending decay, followed by treatment or disposal in the ordinary waste system. A plastic bag in a large can or drum is an appropriate container. Since the half-life of nearly all nuclear medicine imaging materials is in the range of hours or days, storage for a period of one or two months can be followed by disposal in the ordinary waste system with appropriate monitoring. However, this method of disposal is unnecessary for most health care establishments.

4.4.6.1 Dilution and dispersal

This is usually applied to liquid and gaseous waste. The waste can is diluted through dispersal in the sewer system. Gaseous waste can also be diluted through dispersal in the atmosphere in non-inhabited areas.

Low-level radioactive liquid waste is usually handled by direct dispersal in the sewer system. Higher-level waste can be stored pending decay with appropriate radiation monitoring and subsequent dispersal in the sewer system.

Gaseous radioactive waste should be evacuated directly to the outside. Under no circumstances should these be mixed with indoor air. If a special exhaust system is not available, an activated carbon trapping device may be used. This requires maintenance of the trap and monitoring of the off-gas.

4.4.6.2 Incineration

Incineration is a special application of both these general methods: ashes represent the concentration, and air effluent the dispersal. In general, handling of radioactive waste from health facilities does not constitute a significant hazard. However it is advisable to have proper institutionalised monitoring of handling, storage and disposal.

4.4.7 Planning

A waste survey to determine types and quantities of waste arising from existing or proposed health facilities is essential in designing effective waste management programmes.

4.4.7.1 Waste management policy

A waste management policy needs to be developed at central level. This is required for environmental reasons and for identification of operations at facility level.

Waste management frequently depends on services available outside of the health facility such as landfills, central incinerators, sewage ponds, watercourses, municipal waste collection, etc. A survey of existing services needs to be included in the overall waste management survey. Responsible actors should be clearly identified at all levels and waste handling procedures made readily available to all concerned.

Principal elements of this policy should include:

(c) 1 staff member per facility designated waste management officer; 1 supervising officer per division is required at DHT;

(d) All waste categories per facility should be properly identified;

(e) Waste should be properly segregated and disposed of safely and hygienically.

Central guidelines would be appropriate on the following matters:

1) Waste management should prevent occupational, public health and environmental hazards while simultaneously taking aesthetic into account;
2) Recovery and recycling of materials should be encouraged;
3) Existing external waste disposal systems should be used whenever they are acceptable with regard to health and environment considerations;
4) Hazardous health care waste should be dealt with as part of an overall waste management system with appropriate control procedures;
5) Waste contaminated with pathogens of diseases notifiable (or assumed notifiable) under epidemic control regulations should not leave the premises unsterilised.

4.4.7.2 Waste management plan

Options to be considered include:

- Storage plan: primary, secondary storage, etc.;
- Transport: materials and personnel;
- Codification of recipients and means of transport;
- On-site incineration or transport to a central incinerator;
- Incineration of all waste or only selected waste;
- Heat recovery with on-site incineration;
- Provision of spare incineration capacity;
- Use of macerator for specific waste (consultation with local authority);
- Use of compactors for general waste (consultation with local authority).

4.4.7.3 Training

Basic training in waste handling procedures should be given to all personnel as part of the training programme. This programme should include information on:

- hazards of health care waste;
- methods of preventing the transmission of cross-infections related to waste handling methods;
- The safety procedures for dealing with chemical, pharmaceutical and radioactive waste and sharps;
- Proper waste segregation handling, packaging, transport and disposal;
- Action and notification to supervisors in case of accidents.

The content of these programmes should be periodically reviewed and updated as international directives evolve at a fast pace, and because safety procedures tend be neglected in time when not kept at the forefront of the agenda.

Bibliography : Management of waste from hospitals and other health care establishments - WHO 1985

5 Resources for delivery of health services

5.1 NORMS AND STANDARDS

5.1.1 Staff

5.1.1.1 Main categories

Main categories of workers in the health system include medical, nurses, technician, and community workers in addition to support staff. Within the Nurses category, there are the professionals (SRN) and paraprofessionals (SEN and CHN). The “technician” category includes Public Health Officer while “community workers” include Community Health Worker (CHW) and Traditional Birth Attendant (TBA).

Doctors and dentists form the bulk of the medical category. Such professional cadres are generally trained abroad and only a few Gambian doctors return to work in The Gambia. About 150 Cuban doctors recently arrived in the country. The increasing dependence on expatriate doctors at all levels of care raises the issue of sustainability. Consequently, standard minimum staff requirements for each type of facility need to be defined in that context.

Nurses provide the majority of clinical care at all three levels of the health service. There are three main categories of nurses. There are also specific categories such as Public Health, Pre-operative and Access Nurses. With regard to proposed norms and standards for delivery of health services, recommendations will be made for the three main categories:

- State Registered Nurses (SRN),
- State Enrolled Nurses (SEN)
- Community Health Nurses (CHN).

SRN is a professional nursing cadre while SEN and CHN are para-professional nursing cadres. SRNs have the highest academic qualifications and CHNs the least. SRNs and SENs are employed primarily in health facilities while CHNs are largely employed to work in communities.

The SRN course is of three years duration. However, most graduates return after a period of service to undertake an additional one-year midwifery course. Responsibility for organisation and administration of the course leading to certification and the one-year

post-basic course for a certification in midwifery (state certified midwives (SCM)) lies with the Department of Nursing and Midwifery respectively.

SEN work at the secondary and tertiary levels of care, liase with the CHN at PHC key village level, implement and evaluate school health programs in collaboration with CHNs and school teachers, teaches and supervises students on practical attachements, and supervise auxiliary nurses (CNAs). The SEN school was established in 1987 to furnish staff with adequate skills and knowledge of nursing sufficient to allow practice alongside SRNs. Recently, a midwifery programme has been commenced within the school.

Community Health Nurses (CHNs) operate at the primary and secondary levels but have specific responsibility to supervise the performance of VHWs. The CHN also participates in the training of village health workers and traditional birth attendants. The CHN School was established to provide this staff cadre. Its training program covers basic nursing midwifery, community nursing, first aid, health education, nutrition, child health, family planning, public health involving community and school health, procedures for establishing village development committees (VDCs) and supervision of the VHS.

Training schools have been established in Bansang, (CRD), and Mansakonko (LRD) for the two para-nursing cadres especially designed to fulfil BHC needs in the PHC system. The training of para-professionals is cost effective as there is a more readily available pool of trainees (than that for SRN) and a shorter training period of 2 years is required. In addition, if they can adequately meet the needs of the primary and secondary levels of care then increasing supply will free up professional nurses for tasks that require a higher level of technical skill.

Public Health Officers (PHO) are responsible for health promotion and protection including environmental hygiene and sanitation, immunisation and other preventive health measures at the various levels of the delivery system. Training of PHO health officers is undertaken in the School of Public Health, part of the Gambia College. In 1997, the duration of the PHO course was increased from 3 to 4 years. Health courses offered by the Gambia College are funded though the Department of State for Education.

The Divisional Health Teams train VHWs and TBAs. These are selected by the community's village development committee and trained to provide health services to the community: they are not government employees and are supposed to be supported by Village Development Committees.

5.1.1.2 Minimum staff package by facility type

PHC

The staff necessary for each village comprises:

- 1 Village Health Worker (VHW),
- 1 Traditional birth attendant (TBA).

These teams are already operational in established PHC villages and represent the best combination at this level. However, a CHN is necessary to supervise the quality of the work performed by such grassroots workers. Although the CHN resides in one of the cluster of 5 PHC villages, he/she is considered part of the MiHC team.

MiHC

Staffing needs for MiHCs are a function of the activity of these structures. It is assumed that the population to be served has the following characteristics:

- Catchment area : 15.000 inhabitants
- Rate of children under 1 year: 4,2% out of the population
- Rate of women in bearing age : 22%
- Rate of population under 15 years : 44%

These assumptions translate to the following sub-populations:

Demographic profile of community served		
Number of inhabitants		15 000
number of children < 1 year	4,2%	630
Number of women age 15-49	22%	3 300
Number of children < 15 years	44%	6 600

The main packages of care and services to be provided at the MIHC level are the following:

- Curative care
- Chronic care
- Antenatal Care
- Family Planing
- Well-Baby services

For each category of service, based on previous research and analyses of effective MiHCs, the following stipulations are made:

- Curative care: The whole population of the catchment area is concerned by curative care. The number of contacts per each inhabitant is 0.8.

Curative care		
Number of contacts per year (1*2)		12 000
1) Population	15 000	
2) Contact per capita	0,8	

- Chronic care: The proportion of new cases is 0.3% within the population of the catchment area. The estimate for the coverage of chronic care is 50%.

Chronic care		
Number of contacts per year (1*2*3)		23
1) Population	15 000	
2) Number of news cases	0,30%	
3) Percentage of coverture	50%	

- Antenatal care: The number of births expected is the number of population * growth rate. Women should be seen at least 3 times during their pregnancy. However, not all women will come to the MIHC; thus, the cover rate used for calculation is 80%.

Antenatal Care		
Number of contacts per year (1*2*3)		1 512
1) Birth expected	630	
2) Number contacts per pregnancy	3	
3) Percentage of cover	80%	

- Family planing: Women of child-bearing age are important to the family planing programme. Number of contacts expected per year is the result of the number of women in bearing age * the contraceptive prevalence rate.

Family Planing		
Number of contacts per year (1*2)		396
1) Number of women age 15-49	3 300	
2) Contraceptive prevalence rate	12%	

- Well-Baby services: this range of services involves children under one year. Number of contacts is about number of vaccine shots. For ANC, not all children are seen. An 80% coverage rate is projected.

Well-Baby services		
Number of contacts per year (1*2*3)		2 520
1) number of children < 1 year	630	
2) contacts per year	5	
3) Percentage of cover	80%	

The total care and services provided per year for an MiHC serving a community with the demographic profiles described below is 16,451

Package of care and services provided	
Curative care	12000
Chronic care	23
Antenatal Care	1512
Family Planing	396
Well-Baby services	2520
Total care and services provided per year	**16451**

Workload of Health professionals[2]

[2] Staffing proposed by PHPNP lists over 50 medical and support personnel for MiHCs and about 130 for MaHCs. The staffing schedule proposed by consultants (approximately 10 for MiHCs and 30–120 for MaHCs depending on size) is based on widely accepted norms and standards, computation of which is detailed in

To determine total workload of health workers in MiHCs, the number of patients seen per day should be determined. Assuming 260 workdays per year, number of contacts per working day is 63.

Total care and services provided per year		16 451
Working days per year	260	
Contact per working day		**63**

Time spent with each patient will vary. However, studies and observations have showed that the average time necessary and spent with each patient is between 6 and 12 minutes (average: 15% of 1 hour).

Health workers do not spend all their business hours with patients. They also have to attend to various administrative tasks. The assumption is that 80% of the health worker's time is allocated to services delivery.

With these assumptions, number of working hours per day needed per health worker is 12 hours.

Contact per working day	63
Time per patients (% of hour)	15%
Hours per day needed for patients	9
Time allowed to services delivered	80%
Working Hours per day needed	**12**

The number of working hours per day is 8. Therefore, the number of health workers needed to run an MIHC is 12 / 8 = 1.5. Two health workers are necessary to run an MIHC serving a community with the demographic profile presented below.

Working Hours per day needed	12
Working hours per days	8
Number of Health Professional needed	**1.5**

As in-training and other extra activities are sometimes required, MiHCs need to have 2 health workers for proper operations. The best combination should be one nurse and one mid-wife. Alternatively, the team could have one nurse and one nurse/mid-wife (registered or enrolled). Moreover, for public health purposes, a PHO should be included in each MiHC.

Only activities to be performed by health workers are mentioned here. 2 technicians are proposed for other MiHC activities. A ratio of 1 support staff for 1 health worker or technician should be used. Consequently, 5 support staff are required at each MiHC.

pages 54-58 of final report. In addition, certain staff categories derive from non-medical considerations: the number of drivers, for example, will depend on decisions with regard to numbers of vehicles to be provided at each facility. Refer to Annex G of Volume 2.

Nurses and midwifes should be provided with staff-quarters as they need to be available to the population on a 24-hour basis for emergencies. Other quarters may be provided as funding permits.

The complete staff complement for a MiHC should consist of the following:

- 1 Nurse
- 1 midwife or nurse/midwife
- 1 Public Health Officer
- 2 Technicians,
- 5 Support staff
- 10 TOTAL

2 to 4 Community Health Nurses are also required to assist and supervise health posts. CHNs could stay in a key village that is, one of the health posts supervised. Technically, however, they are part of the MiHC.

It would be preferable if a MD could serve at this level. However, due to the lack of these professionals, it may not be feasible and it is not absolutely necessary.

MaHC

Staff for MaHC should be different and distinguished from DHT personnel. Specific composition will depend on number of beds and size of facility.

In this report, the number of beds necessary for each MaHC is based on location. MaHCs and hospitals could be split in 3 categories:

- A: Small MaHCs, with 20-40 beds
- B: Large MaHCs, small hospitals with 110 –150 beds
- C: Very large MaHCs or hospitals, with more than 200 beds.

Distribution of facilities are as follows:

- group A, 5 facilities: Soma, Kuntaur, Yoro Bawol, Esau, Bwiam
- group B, 3 facilities: Brikama, Basse, Farafenni
- group C, 3 facilities: Serekunda, Bansang and RVH

Ratios of main health professional categories by number of beds should be the following:

- 1 MD per 50 beds
- 2 technicians per 50 beds
- 1 paramedic per 4 beds, with a third professional (SEN) and 2/3 para-professional Nurses
- 1 assistant nurse per 1 nurse
- 10 paramedicals per physician.

For a group A facility (20-40 beds), numbers of professionals needed should be:

- 1 MD,
- 2 Technicians
- 10 Paramedical, (4 Registered Nurses, 6 SEN)
- 10 Assistant nurses

However, 24hr medical service is required. A sole MD can not undertake that burden. Therefore, group A facilities should also be staffed with 2 MDs.

For deliveries and MCH services, one midwife is required. 1 support staff per 3 professional staff is required. For 15 professionals, 5 support staff is necessary. Also, 2 management staff, including an accountant and 1 clerk should be added to the team.

Based on these criteria, the team for group A MaHCs should include 32 workers:

- 2 MDs,
- 1 Midwife
- 2 Technicians
- 4 Registered Nurses
- 6 SEN
- 10 Assistant Nurses
- 5 support staffs
- 2 management staffs
- 1 clerk

For group B facilities (110- 150 beds), the 116-member team should comprise:

- 3 MDs,
- 3 Midwifes
- 6 Technicians
- 40 Paramedicals, (14 Registered Nurses, 26 SEN)
- 40 Assistant Nurses
- 5 support staffs
- 6 management staffs
- 3 clerks

Group C facilities are similar to hospitals as detailed below.

Group A facility (20-40 beds)	**Group B facility (110- 150 beds),**
• 2 MDs, • 1 Midwife • 2 Technicians • 4 Registered Nurses • 6 State enrolled Nurses • 10 Assistant Nurses • 5 support staffs • 2 management staffs • 1 clerk	• 3 MDs, • 3 Midwifes • 6 Technicians • 14 Registered Nurses • 26 State enrolled Nurses • 40 Assistant Nurses • 15 support staffs • 6 management staffs • 3 clerks

Hospital

There are no staffing norms for the referral hospital. Numbers of each category of professional depends on the type of specialised services that are implemented in each establishment. The categories of health workers are:

- MDs,
- Registered Nurses,
- Enrolled nurses,
- Technical staffs

Various ratios could be used based on number of beds and nature of services: for example, intensive care requires more staff than internal medicine. For the latter, ratios are: 1 MD per 50 beds, 2 Technician per 50 beds, 1 Paramedical per 4 beds, with a third professional (REN) and 2/3 para-professional Nurses, 10 Paramedicals per physician.

5.1.1.3 Staffing Costs

5.1.1.3.1 MiHC

These estimates are based on average salaries for each category. Benefits, social security, and other costs should be added in compliance with local labour laws.

Unit cost per facility, in dalasi:

	Number	Annual cost	Total cost
Nurses / Midwife / PHO	3	13000	39000
Technical	2	7000	14000
Support staff	5	5500	27500
	10		**80500**

If 59 new facilities are commissioned, the annual cost for salaries only would be D4,749,500.

	Cost per facility	Number of facility	Total cost
Staffing cost	80 500	59	4,749,500

MaHC

For referral heath center, the annual cost for staffing would be:

Group A

Category	number	Unitary cost	Total cost
MD	2	25000	50000
Technicians	2	7000	14000
Nurses / Midwives	11	13000	143000
Assistants Nurses	10	10000	100000
Support staff	5	5500	56500
Management staff	2	13000	26000
Clerks	1	5500	5500
Total	**33**		**395000**

Group B

Category	number	Unitary cost	Total cost

MD	3	25000	75000
Technicians	6	7000	42000
Nurses / Midwives	43	13000	559000
Assistants Nurses	40	10000	400000
Support staff	15	5500	82500
Management staff	6	13000	96000
Clerks	3	5500	16500
Total	**116**		**1271000**

5.1.2 Civil works

5.1.2.1 Existing facilities

Existing infrastructure for the delivery of Health Services is summarised in table below.

5.1.2.1.1 Trekking Stations

These are simple structures comprising an office cum store erected by communities. They are often constructed with load bearing mud blockwalls, rhun palms roof strucutes, with thatched or corrugated roof. Due to lack of appropriate construction techniques and poor financial resources, the structures are often of poor quality and last only 2-3 years.

Most trekking stations do not even have a covered waiting area for mothers. A tree is often used which provides no shelter from the rains. During the rainy season, a time when diseases are rampant, weather interruption to health programmes is frequent. In cases were finance is available, the communities are not advised on the most suitable appropriate facilities in line with government policy. In the North Bank for example, there is a community that succeeded in mobilising funds and embarking on construction of a large facility of the size of a MiHC using durable materials such as sand cement blocks. Midway through the project, funds ran out and the facility is still incomplete.

Trekking stations are visited by staffs from health centres on a monthly cycle for MCH. In cases were the Trekking station is a Key Village, there is a CHN who uses the facility to carry out administrative duties and promote preventative medicine. The facility is without M&E services like running water, drainage or electricity supply, and toilet facility.

Staff housing is generally not provided as the CHN lives within the community.

The HSRS did not report on these facilities: a survey should be carried out to record their current state.

5.1.2.1.2 Sub- Dispensaries

These are structures constructed and owned by DoSH. Sub-dispensaries are often one building block made up of 4-8 rooms. They are made of load-bearing blockwork, rendered both sides. Roof structures vary, although most are made up of rhun palm & GCI sheets. Windows and doors are steel- or timber- framed. The buildings are generally in a state for disrepair. This is the obvious outcome in situations where little or no maintenance budget is available for maintenance (see strategy for building

maintenance). Many Sub-dispensaries are in such poor state that complete replacement is warranted. There are no utilities such as telephone, running water, or electricity supply.

Health Pyramid	Facility type	Brief discription	Construction & materials
Primary Health Care	Trekking Stations	One office and adjacent waiting area	Simple mud structure constructed by local communities using locally available materials. Structures are owned by the community.
Secondary Health Services	Sub-Dispensary	One building block with 8-10 rooms. Some have a covered waiting area adjacent. Staff housing provided.	DoSH facility constructed using sand cement block wall and GCI roof material.
	Dispensary	One building block with 8-10 rooms. Most have a covered waiting area adjacent. Staff housing provided.	DoSH facility constructed using sand cement block wall and GCI roof material. Some have asbestos roof.
	Minor Health Centres	A two building block with 6-10 rooms in each make up the health facility proper. Adjacent ancillary buildings and accommodation for senior medical staff.	- ditto -
	Major Health Centres	A complex with over 40 rooms & staff quarters.	- ditto -
Tertiary Health Services	Hospitals	Over 100 rooms and staff quarters. However hospitals in the Greater Banjul only have a few flats for doctors on call, and no housing.	- ditto -

The areas most frequently damaged are toilet facilities and associated drainage. These cause further damage to building fabric and finishes. A constant complaint of health officers concerns patients' and escorts' inability to use WCs.

Sub-dispensaries are used as a permanent health post for the distribution of essential drugs and simple curative medicine. No in-patient care is provided but staff quarters are.

5.1.2.1.3 Dispensaries

The difference between the dispensary and the sub-dispensary in terms of infrastructure is not obvious: they are marginally bigger than dispensaries and some have provision for 24hours in-patient care.

5.1.2.1.4 Minor Health Centres.

These are usually constructed of very durable materials erected under strict supervision. Minor HC are used for curative purposes for minor illnesses and simple delivery, hence the in-patient care. The facility has running water and electricity via a local water tank and generator. Few Minor Health centres are located in settlements were utility is

provided by NAWEC. Staff Quarters are provided. The grounds are all secured with a fence in rural areas. In urban areas, some fences are damaged.

5.1.2.1.5 Major Health Centres

These are made of durable building materials that will stand the test of time. They are constructed under proper supervision, with emphasis on quality workmanship and finish. Major HC are used for curative purpose for serious illnesses and difficult deliveries, hence there is a large in-patient care requirement to cover whole regions The facility has running water, electricity and telephone provided by the National utility companies. Stand-by generator and water tank are also always available. Staff Quarters are provided for the numerous senior staff. The grounds are fenced, although fencing is frequently damaged.

5.1.2.1.6 Hospitals

These are similar to MaHCs. Staff housing is not provided within the GBA, only flats for doctors on-call. The grounds are secured with a fence.

5.1.2.2 Existing prototype drawings

During the HSRS, prototypes were developed for the following secondary health facilities:

1. Dispensaries
2. Minor health centres
3. Major health centres.

These drawings are complete with notes and outline specifications for upgrading of existing structures to meet prototype standards. The drawings are of the buildings only, no site layouts were available.

5.1.2.2.1 Trekking stations

No prototype design exists for trekking stations.

5.1.2.2.2 Sub-Dispensaries

No prototype design exists for sub-dispensaries.

5.1.2.2.3 Dispensaries

Based on the MPA established during the HSRS, facility prototype reflects activities to be accommodated. In the proposed health pyramid, the “dispensary” category of facility is removed. It will therefore not be necessary to construct such facilities in future.

5.1.2.2.4 Minor Health Centre

In the proposed MPA, the newly defined MiHC is similar to the old minor health centre in terms of infrastructure required to provide the MPA. Existing design drawings suggest 5 buildings as follows

1. Outpatients
2. General Ward

3. Operating Theatre
4. Senior Staff housing
5. Junior Staff housing

The existing prototype is compact and economical to construct. However, spatial allocation can be improved for better delivery of services. Also, as the minimum package of activity has changed, the design should reflect such changes. New standard layouts are proposed as attached in the civil works annex (in volume 2 of final report).

5.1.2.2.1 Major Health Centre

The old major health centre is quite similar to new proposed MaHC with regard to building area. However, services provided differ considerably. Existing designs suggest 6 buildings as follows:

1. Outpatients
2. General Ward
3. Maternity Ward
4. Operating Theatre
5. Senior Staff housing
6. Junior Staff housing

As with minor facilities, design is compact and economical to construct. Similarly, also, design efficiency can be improved. The MPA for MaHCs has changed, and that change should be reflected in prototype. Proposed standard layouts are attached in annexes.

5.1.2.2.6 Hospitals

No prototype design exists for hospitals

5.1.2.2.2 Staff Quarters

- Senior staff quarters: 2-bedroom house
- Junior Staff: bedroom house.

The design for 2-bedroom senior staff quarters is generally adequate while the single bedroom junior quarter is revised. Ideally, one additional room for each level was thought necessary. New prototypes for 2-bedroom junior and 3-bedroom senior quarters were prepared.

There are no out door cooking facilities: if required, these will form part of external works.

5.1.2.3 Proposed policies and strategies

5.1.2.3.1 Short term strategies

Economy of resources

Economy of financial and human resources is a prime immediate consideration to be balanced with the quality of output. It is preferable to economise on the quantity (size and numbers) and sophistication than on quality of materials and technology.

Over the life span of a major health facility, capital investments are relatively small compared to overall costs of health care delivery in the long run. Capital investment in a higher level facility is less likely to balance-out in the long term health budget.

Construction industry

Available know-how and building materials as well as existing skills have to be considered in specification of norms and standards. Local skills vary in quality and good workmanship is still a scare resource. Significant efforts through GTTI are likely to improve on local workmanship in the long term. In the shorter term, proposed norms and standards should be premised on basic construction principles and avoid complex technology.

The bulk of the materials are imported and there is a well-established local market for imported materials. The capacity and profile of this market must also be considered and, wherever possible, strengthened. Any shifts in the current paradigm toward indigenous production can only be proposed in the long term (see below).

5.1.2.3.2 Long term policies

Visibility

If buildings are perceived to contribute to a positive community image, then health complexes are prime tools to that end. Therefore, medical facilities need to be well designed, to high quality architectural standards.

Medical parameters

Medical buildings last considerably longer than the installations, furniture and equipment within Thus, a modular structure that allows for flexible development without need for demolishing the main frame is ideal. The frame should outlast the rest of the infrastructure by far. Moreover, it must endure numerous building and demolition works.

Medical buildings require finishes that are of the highest standard for hygienic reasons. People or patients who come to a hospital are unwell, but also distressed, apprehensive and anxious. The hospital environment has to be comforting and comfortable; airy, spacious and light.

Medical staff primarily deal with human misery (other than maternity staff who are thus confronted on relatively few occasions). Therefore, environment and quarters need to be as comfortable as possible.

Maintenance requirements

Health facilities require a 24-hour, high hygienic environment. There is more cleaning, more frequently, more elaborately, and with more aggressive detergents. Therefore, finishes and construction should take into account:

- ease of maintenance - all building parts should easily accessible;
- high resistance to maintenance - high quality finishes materials and joints.

All technology must be basic and simple, but of the highest possible quality,

The criterion of minimising number of units translates to economies on all building components from a maintenance point of view: e.g. preference for a single door over double doors to reduce on hinges, bolts, locks, etc.; and preference for one window instead of two.

Environmental considerations

Building technology

The UN approach of localising Agenda 21 has had its impact on construction technology throughout the world. The basic principle is that all construction activity must minimise long term environmental impact. In practice, this is translated to ”life cycle” analysis of all materials, technologies and operations. The life cycle analysis runs through the following phases (if applicable):

- Cultivation
- Harvesting
- Mining
- Production
- Transport
- Installation
- Operation
- Maintenance
- Recycling
- End of life

In view of the limited resources in The Gambia, these criteria cannot be applied severely. However, whenever there is a choice, the minimum environmental impact solution should be opted for.

5.1.2.4 Master planning of referral facilities

5.1.2.4.1 Change

Medical facilities are continuously subject to change:

- Existing departments disappear
- New departments appear
- Existing departments change operation policies
- Departments and groups of departments shrink and grow

Therefore facilities need to be highly flexible in building layout (see drawings in annex), but also in overall layout. Four groups of departments need to be organised into an open-ended structure:

- Out patient department (OPD)
- Clinical departments or nursing zone
- Medical services
- Support services

Nursing zone

The nursing zone should be located centrally in the facility. It focuses on the patient as the prime participant in the health care delivery system. Dimensions are determined by numbers of beds, and an average of 30 beds is considered optimal for a nursing team. Ward sizes do not change. Required bed numbers is achieved by increasing number of wards rather than number of beds. The nursing zone, therefore, should be open-ended on one side to ensure addition of future wards.

Patient wards

Patient quarters should be the form of a comforting environment (rather than a curing machine). Where possible, wards should be arranged around a landscaped courtyard with shady trees, flowers and some benches. These require minimum care and maintenance, and contribute considerably to patient and staff well-being.

Medical services

Medical services are located in the vicinity of the related wards (labour opposite maternity, theatre opposite surgical ward, etc.,) and quite close to out-patient services and accident and emergency.

They can be somewhat distant from the support services as traffic between them is less frequent compared to other circulation patterns in the facility.

Support services

Support services are located next to the wards. They are linked to a common and fenced service yard for efficiency and security. Delivery trucks should be able to access the yard.

Out patient services

OP and A&E services are located in the front of the facility. Medical services should be located in close proximity as OPD and A&E operations frequently rely on them.

The OPD reception constitutes the single point of entry for patients and visitors. It requires architectural features to emphasise and highlight this concept.

The occasional stray visitor is unavoidable unless controlled by severe management measures. For its part, the masterplan must not facilitate direct access by visitors into the inner core of facilities, and visual links to the nursing zone should be obstructed. It is not advisable to close off any circulation as this hampers flow in respect of efficiency and emergency traffic.

5.1.2.4.2 Containment

Medical facilities grow easily. Medical technology and operational policies evolve to reflect cultural and scientific developments, and standards and expectations are ever increasing. It is therefore important to spatially contain medical facilities, observe proximity criteria for departments, and allow ample space for natural light and ventilation.

Spatial constraints could induce the development of multi-storey buildings, as the stacking of various departments on the same plinth area is optimal. However the use of lifts is untenable from maintenance point of view, and has imposed considerable strain on personnel in the past.

Therefore ground floor developments only are advised, observing containment as illustrated in the attached master plans.

5.1.2.4.3 Circulation

There are various modes of circulation in a medical facility. All are different and quite a number are in conflict with others. The three circulation patterns described below must not interfere with each other. Perfect circulation however can never be achieved and conflicts are unavoidable: compromises have to be made due to economy and/or spatial constraints.

Out patient circulation
This is to be kept apart from internal circulation. A barrier is to be created between OPD and the rest of the facility.

Internal circulation
Internal circulation must be limited for reasons of capital investment as well as recurrent cost and time.

- Patient visitors circulation: kept apart from all circulation
- In patients circulation: kept apart from visitors circulation
- Internal supplies : kept apart from visitors circulation

External (mechanical) circulation

- Ambulance and emergency access: separate from all traffic
- Collection of diseased: separate from all traffic
- Collection of waste : separate from all traffic
- Deliveries of supplies :
- Professional visitors : kept separate from ambulance and collection traffic, no conflict with each other.

5.1.2.4.4 Building layout

No building gets outdated as fast as a medical building. No sooner is a health facility commissioned than parts of it are being converted into something else deemed more appropriate or more state-of-the-art. This is unavoidable.

Buildings should be as flexible as is achievable. A modular structure that allows reduction, enlargement, or modification of room sizes is advisable. The international hospital building grid is based on the minimum module of 600 mm, and all dimensions are multiples of 600 mm.

Buildings must be orientated east - west to avoid heat accumulation by direct solar radiation via facades. If possible, buildings should be lined up such that one building protects the other from the sun.

Because buildings should allow for cross ventilation by prevailing winds, spans must be limited (less than 15 metres) to allow for cross ventilation and optimal natural light. Whenever feasible, internal walls must contain windows to allow through passage of breezes.

Distances between buildings must be sufficient to allow for ventilation, natural light and privacy (minimum 6.000m). However, concomitantly, distances must be limited to observe containment and to avoid over-extensive circulation (maximum 8.000 m).

5.1.2.5 Spatial requirements

Based on the MPA for MiHC and the CPA for MaHC, spatial requirements for the various facilities were established to ensure efficient functionality within facilities. This was used as the bases for revision of the prototype designs. DoSH further requested that a new prototype trekking station be prepared for possible adoption.

Trekking Stations and Village Health Posts

These comprise the following:

1. 3 lockable rooms, 3.0x 3.0m each;
2. waiting shed 6.0x 6.0m.

Secondary level: Minor Health Centre

A generic facility layout or master plan is proposed that can be applied either to a virgin site or can be employed as an instrument for the upgrade of existing facilities. Where existing facilities are retained, departments are added on and/or existing departments converted. Proposed standard layouts of departments and a typical master plan is attached.

The MiHC comprises the following:

1. Main rooms, 210m2
2. Waiting area and veranda, 40m2

Secondary level: Major health Centre

A generic facility layout is proposed for application to a virgin site or as for use as instrument for upgrading of existing facilities. Where existing facilities are retained, departments may be are added on and existing departments converted.

A proposed standard layout of all departments and a typical master plan as well as masterplans for various earmarked facilities are attached. In view of the extended MPA for MaHC as compared to the existing major health centres, none of the existing sites are large enough to accommodate new MaHCs. A site of approximately 12,000 m2 is required to provide space for the proposed services and comfortable circulation, and to allow for future expansion. Only Soma, Bwiam and Serrekunda have sufficient space: Bwiam requires minor modifications to comply with the MPA; Soma and Serrekunda require additional services as indicated in attached plans.

Tertiary Level: Hospitals

No standard design exists for hospitals. Existing hospitals are based on custom-designed briefs for specific projects. As the number of hospitals that will be commissioned in the next few years (existing and proposed) far exceeds required number of facilities, no new hospital are anticipated in the near future. However, existing hospitals are likely to require additional facilities. It may be possible in some cases to utilise designs of departments proposed for MaHCs with some changes.

5.1.2.6 Building standards and norms

5.1.2.6.1 Trekking stations

Office / store

1. Walls shall be 150mm sand cement block wall with render on both sides (paint finish optional)
2. Roof - GCI roof on timber purlins
3. Floor – concrete with paint finish
4. Ceiling (optional) – hard board

Waiting Shed

1. Walls – none
2. Roof - GCI roof on timber purlins.
3. Floor – earth, raise 150mm above existing ground level.

5.1.2.6.2 Minor Health Centre

Main rooms

1. Walls 200mm sand cement blockwork with render on both sides and paint finished;
2. Roof – profiled steel roof on timber or steel purlins;
3. Floor – concrete with ceramic tile finish
4. Ceiling – hard board or celotex

Waiting Area

(b) Walls – none
(c) Roof - profiled steel roof on timber or steel purlins.
(d) Floor – fair face concrete with optional ceramic tiling.

5.1.2.6.3 Major Health Centres

As for MiHCs.

5.1.2.6.4 Hospitals

The basic building standards for hospitals are similar to facilities at the MaHC level. Additional requirements are specific and relate to specialist services and/or equipment. Norms and standards are to be developed on an as required basis. However, flexible

layouts must be considered in designing specialist departments, avoiding tailored solutions at any given time.

5.1.2.7 Standard drawings

Standard drawings prepared for various categories of facilities are attached in the civil annex including the following.

MAJOR HEALTH CENTRE	MINOR HEALTH CENTRE	PRIMARY HEALTH FACILITIES	ANCILLARY FACILITIES
Disposition plan	Master plan	Trekking station	Waiting mothers – 4 units
Master plan 30-90 beds	Mother & Child care	Village Health Post	Waiting mothers – 8 units
Master plan 75-180 beds	Curative care		Pit latrines
General ward – 30 beds	Generator house		Showers/laundry
General ward – 15 beds	Minor theatre block		Sinkirikuto
Ward combinations			
	YOROBAWOL master plan		
OPD / A&E			
Laboratory			
Medical imaging			
Operating theatre block			
Labour ward			
Administration			
Kitchen			
Laundry			
Generator house			
Mortuary			
SERREKUNDA master plan			
SOMA master plan			

5.1.3 Equipment

As with other health care resources, equipment management is a major weakness in the health sector. Deficiencies in equipment planning have rendered health facilities incapable of executing their most important missions. A major contributory factor is the insufficiency of appropriately trained technical and managerial staff.

The National Health Policy (NHP) seeks to ensure optimum functionality of health facilities in order to improve quality of care, effectiveness and efficiency. This would obviously include strengthening of the planning and provision of equipment. The planning procedures proposed in the following paragraphs is intended to be in line with government objective of making health resources attainable by all.

5.1.3.1 The existing situation

5.1.3.1.1 Current situation of the equipment in health facilities

Although the NHP documents the government's intention of improving the equipping of facilities in order to strengthen quality of health care and motivation of staff, the existing situation is worrisome.

Inadequate quality and numbers of equipment combined with lack of planning has made peripheral health structures quite incapable of performing functions assigned them.

In all minor health centres and dispensaries, biomedical equipment is in short supply and such equipment as exists is in such poor condition that attempts to repair them would be pointless. MaHCs are also poorly supplied with biomedical equipment although some are better supplied than others in terms of types and total numbers. Because of the age and condition, many pieces of equipment in MaHCs are beyond cost-effective repair.

Acquisition of equipment is neither planned nor systematic. New equipment is donated without regard to the profile of existing equipment so that redundancies and/or incompatibilities result, while critical needs are unmet.

There are other weaknesses at the level of referral facilities: MaHCs are still not functional and support units such as theatres, laboratories and radiology are yet to be fully equipped.

5.1.3.1.2 Equipment management

The capacity to plan is severely restricted both at central and divisional levels. This lack of capacity is a major weakness in the sector. The DSS and the DHT, key actors in equipment management, have severe human resource problems. As a result, there are great disparities with regard to the distribution of scarce resources; there is poor and bad use of equipment; and generally inadequate coverage of the population.

This situation focuses attention on the crucial capacity requirements in the field of equipment planning and management.

5.1.3.1.3 Budget

There is practically no budget assigned for the purchase or renewal of equipment.

5.1.3.2 Review of existing equipment lists

The terms of reference require that Consultants review existing lists of equipment. Only two such lists were found:

- List of equipment which is in the AfDB Appraisal Report of October, 1997
- Annex 5.3.1.1 to HSRS – Phase II report

Review of list of equipment in AfDB Staff Appraisal Report

This list presents several problems:

- Equipment were inventoried by departments without any correlation to anticipated MPA for health facilities;
- It is limited to health centres only;
- The departments for which lists were developed are
  - Maternity, Male / female, Paediatric ward and outpatient
  - Anaesthesiology
  - Laboratory
  - R-ray

- As this list was not developed on a room by room basis, it is difficult to estimate the relevance of estimated quantities. At least some items were overestimated with regard to health centre requirements as in 10 sphygmomanometers, 4 suction machines electric, and 4 ECG prescribed for wards. There are also repetitions (four suction machines twice).

A few observations on the qualitative profile of the equipment are necessary:

- electrocardiographs are not necessary for health centres;
- sterilisation by boiling water must be banned: sterilisers replaced by portable autoclaves;
- anaesthesia equipment, a bronchoscope and a proctoscope, were prescribed for the wards. If these are at all relevant, they must be placed in the operating theatre. But they do not appear relevant to the requirements of a health centre;
- 2 radiology apparatus and 2 ultrasound machines were prescribed for health centres: these quantities seem disproportionate.

The equipment list in annex 5.3.1.1 to HSRS – Phase II report

This equipment list is more compatible with the MPA foreseen for every category of facility. However, it does not include furniture and was not elaborated on a room-by-room basis.

Some problems must, nevertheless, be underlined:

- Imaging equipment for health centres (2 radiology equipment and 2 ultrasound machine) is not justified;
- boiling sterilisers must be banned and replaced by autoclaves ;
- quantities prescribed for some goods seem exaggerated such as 2 electrocardiographs, 3 operating lamps;
- only 2 table top autoclaves were prescribed.

5.1.3.3 Standard lists for each category of facility

The objective of defining standard lists of equipment is to anticipate diagnosis and treatment coherent with the activities offered in various categories of health facilities. In this process, the international standards, mainly WHO, and equipment life cycle cost should be taken into account.

The list developed hereafter was designed to support health activities defined by the MPA. Priority was given to main programs as defined by the health policy, mainly in the area of MCH. It translates the MPA into equipment required. The proposed equipment profile is also based on the morbidity and mortality structure. As these indicators express priority needs, the standard list of equipment proposed will contribute to the priority program interventions being implemented by government including:

- Family Health, including Maternal and Child Health, Family Planning, Nutrition and Immunisation;
- Prevention and Control of Endemic Diseases;
- Health Promotion through IEC protocols and other preventive health measures to address non-communicable diseases.

Equally, equipment should contribute to strengthening institutional capacity of the health sector according to the National Health Development Program (NHDP) for the policy period (1994 – 2000).

The following assumptions were applied:

- Only 1 ambulance is provided at the level of hospitals and MaHCs as all MiHCs within the scope of a referral facility will also be equipped with ambulances. This allows simultaneous evacuation of patients from homes to MiHCs, and from the latter to MaHCs or hospitals;
- The list of rooms and equipment anticipates two operating rooms in the MaHCs: one for the septic surgeries and the other one for the aseptic procedures. The decision to retain these two rooms lies with the DoSH according to such criteria as cost, quality of care, etc. Cost of equipping 1 theatre to proposed standards is $58,000.

Proposed list of rooms and equipment per category of health facility is included in volume 2.

5.1.3.4 Recommendations for improved procurement of goods

The objective of this part of the study is to provide basic elements with which to strengthen procurement of goods. Recommendations were defined on the basis of the IDA - standard bidding document. Sections quoted are the same that those of the IDA document.

SECTION IV. SPECIAL CONDITIONS OF CONTRACT

1. The following Special Conditions of Contract shall supplement the General Conditions of Contract. Whenever there is a conflict, the provisions herein shall prevail over those in the General Conditions of Contract. The corresponding clause number of the General Conditions is indicated in parentheses.

5. Inspection and Tests

The following inspection procedures and tests are required by the Purchaser:

(a) Checking of correspondence to the Technical Specifications and visual inspection of the good general state of equipment;
(b) Verification whether the accessories and spare parts are complete and in good general state;
(c) Checking of electric and mechanical controls;
(d) Performance of electrical safety tests, including at least the checking of protective earth bonding, insulation, and leakage current;
(e) Functional test;
(f) Checking of correct functioning of alarms;
(g) Checking of availability of operation and maintenance technical documents.

8. Incidental Services (Clause 13)

The following services covered under Clause 13 shall be furnished:

(a) The Supplier should provide inland transportation, insurance or other services such as clearing, handling, and delivery through inland transportation from the port to Central Medical Store – The Gambia;
(b) Performance or supervision of the on-site assembly and/or start up of the supplied Goods as requested in Section V. - Schedule of Requirements;

(c) Furnishing of special tools, accessories and disposable required for assembly, normal operation and maintenance of the supplied Goods;

(d) Furnishing of detailed operation, maintenance, technical and service manuals for each appropriate unit of supplied Goods as requested in Section V - Schedule of Requirements;

(e) Conduct of training of the Purchaser's personnel, at the Supplier's and/or on-site, in assembly, start-up, operation, maintenance, and/or repair of the supplied Goods, as requested in Section V - Schedule of Requirements;

(f) Performance of an after-sales service through a regional After-sales Service or Technical Service as requested in paragraph 2 of the "Important Conditions" of Section VI. - Technical Specifications.

The costs of such services shall be included in the contract price and be listed in the price schedule.

9. Packing (Clause 9)

Bidders are requested to group, pack and label Goods in packages following the list of Goods as requested in Section V. - Schedule of Requirements.

10. Spare Parts (Clause 14)

Supplier shall carry sufficient inventories to assure ex-stock supply of consumable spare such as specified in the Technical Specifications. Other spare parts and components shall be supplied as promptly as possible but in any case within six months of placement of order and establishment of Letter of Credit.

11. Warranty (Clause 15)

The warranty period shall be 12 months from date of commissioning.

SECTION V. SCHEDULE OF REQUIREMENTS

The goods covered by this Contract were grouped together in the following six (6) lots according to the function they will fulfil:

Lot 1: Current Furniture;
Lot 2: Medical and Hospital Furniture and Trolleys;
Lot 3: Standard Medical Equipment and Instruments;
Lot 4: Medical and Surgical Equipment;
Lot 5: Laboratory Equipment;
Lot 6: Imaging equipment and accessories
Lot 7: Hospital, logistics and computer equipment;

1. Standards

For all medical equipment, compliance with the standards stated in the Important Conditions listed in the Technical Specifications will be demonstrated by the Bidder with the following documents, as an integral part of the bid:

(a) Utilisation License, issued by the Ministry of Health in the Supplier's or Producer's country; or

(b) Supplier's declaration of compliance of the offered Goods to the quality standards in the manufacturer's country; or

(c) Statement of compliance to the respective standards for similar international standards, issued by an independent, authorised agency in the Manufacturer or Bidder's country; or

(d) Clinical references, including reliability of the equipment (after approx. 1 year of testing in a hospital).

2. Manuals

All the equipment listed in para. 2 of Technical Specifications have to be delivered with the following manuals:

(a) Operation;
(b) Technical;
(c) Maintenance; and
(d) Service.

Manuals have to be in the English language.

3. Delivery Schedule

The Goods covered under this invitation are required to be shipped within 3 months after signing of the Contract.

4. Packing

Bidders are requested to group, pack and label Goods in packages following the list of Goods per lot and per final destination. The Goods for Minor Health Centres and Major Health Centres should be grouped, packed and labelled separately for each one of these health structures. The list of the Minor Health Centres and Major Health Centres shall be provide by the Purchaser.

LIST OF EQUIPMENT PER LOT

Items to be evaluated by lot. The whole lot has to be offered.

Lot # 4

Brief description	Quantity
Anaesthesia unit	
Aspirator, foot operated	
Aspirator, uterine	
Autoclave, horizontal, single door	
Autoclave, tabletop	
Ceiling light, surgical,	
Complete dental chair	
Dental X-ray development unit	
Electrosurgical unit, general purpose	
Foetal heart detector	
Incubator, infant	
Light inactiving	
Light, examination	
Light, surgical, mobile	
Light, surgical, mobile, with battery	
Minor operating table	
Mobile surgical aspirator	
Operating table	
Oxygen concentrator	
Resuscitator, pulmonary, manual, adult	
Resuscitator, pulmonary, manual, child	
Scrub sink – one station	
Sphygmomanometer	
Steriliser, dry heat	
Surgical aspirator, mobile	

Wall sphygmomanometer	
Weighing scale with measuring road, adult	
Weighing scale, infant	

Lot # 5

Brief description	Quantity
Blood bank	
Bunsen burner	
Culture incubator	
Distilling unit – 2 litres per hour	
Electric centrifuge	
Electronic timer / chronometer – acoustic alarm	
Haemoglobinometre	
Manual centrifuge	
Microscope binocular	
Precision balance	
Spectrophotometer UV / visible	

Lot # 6

Brief description	Quantity
Basic radiological system	
Dental X-ray unit	
Scanner, ultrasonic, general purpose	
X-ray viewing box – 2 panels	
X-ray film processor, manual	

Lot # 7

Brief description	Quantity
Air-compressor machine	
Air-conditioning unit	
Computer	
Drier	
Electric iron	
Generator ,with accessories	
Kit HF, transceiver, bases station	
Refrigerator	
Sewing machine	
Solar lamp	
Tension stabiliser for spectrophotometer	
Ventilator	
Washing machine	

SECTION VI. TECHNICAL SPECIFICATIONS

Important conditions

Considering the severe operational conditions in The Gambia, Bidders should conform to the following requirements.

Unexcused failure in the performance of any of these requirements shall render the Supplier liable to imposition of liquidated damages and/or termination of the Contract for default.

1. Warranty

The warranty period shall be 12 months from date of commissioning. It shall be actually assumed by a Supplier's local representative (in The Gambia or in Western Africa).

2. After-sales Service

An After-sales Service or a Technical Service shall exist in Africa, (more precisely between Dakar and Accra), capable of carrying out maintenance operations. This clause applies to the following:

Lot # 4:

- Anaesthesia unit
- Autoclave, horizontal, single door
- Autoclave, tabletop
- Ceiling light, surgical,
- Complete dental chair
- Dental X-ray development unit
- Electrosurgical unit, general purpose
- Incubator, infant
- Light, surgical, mobile, with battery
- Oxygen concentrator

Lot # 5

- Blood bank
- Culture incubator
- Electric centrifuge
- Spectrophotometer UV / visible

Lot # 6

- Basic radiological system
- Dental X-ray unit
- Scanner, ultrasonic, general purpose

Lot # 7

- Air-compressor machine
- Computer
- Drier
- Generator, with accessories
- Kit HF, transceiver, bases station

Bidders should provide the addresses of these technical services.

3. References

Bidders should provide a list of previous medical equipment supply in Africa.

4. Specific tools

If specific tools are necessary for the maintenance of Goods, they should be mentioned and included in the bids.

5. Climatic conditions

The climate in The Gambia is tropical. Consequently the equipment should be supplied in tropicalised version.

6. Instructions

All directions, explanatory leaflets, etc should be written in the English language.

7. Operation and maintenance manuals

For the Goods listed in Condition No. 2 the Supplier should provide:

- 2 user's guides, in the English language;
- 1 complete technical documentation in the English language, with:
  - description and technical diagram;
  - program of preventive maintenance
  - list of disposable
  - list of spare parts

8. Standards

The Technical Specifications describe the main functional, technical and operational features that are required for each item. These descriptions are indicative and may be adapted to the manufacturer's construction standards, but within the limits of plus or minus 10%.

All equipment must be new, of reputable manufacturers, in agreement with the specifications, and in accordance with the safety regulations and other standards that are applicable in the Manufacturer's or Supplier's country, provided they are at least equivalent to European Standards.

9. Accessories and disposable

Generally, the Technical Specifications list the accessories and disposable to be supplied with the Goods. Regardless of these lists, the Supplier should mention and include in the bid all the accessories and disposable allowing the normal operation of devices during three months or for 100 operations as the case may be.

10. Spare parts

Apart from the spare parts specified in the Technical Specifications, the Supplier shall carry sufficient inventories to assure ex-works supply of important and common spare parts.

11. Electricity

The electrical supply shall be 230V/5Hz, single phase. Electrical outlets shall be in accordance with the British Standards. All equipment items to be electrically plugged-in must be supplied with an electric cord with the corresponding plug.

12. Assembly, installation, testing and commissioning

The Supplier shall assembly and install in the designated rooms and connect to the required connection facilities the following items:

Lot # 4:

- Autoclave, horizontal, single door
- Ceiling light, surgical,
- Complete dental chair
- Dental X-ray development unit

Lot # 6

- Basic radiological system
- Dental X-ray unit

Lot # 7

- Air-compressor machine
- Generator, with accessories
- Kit HF, transceiver, bases station

The Purchaser will designate a local engineer to undertake the supervision of this task.

After the installation has been completed, the Supplier shall make all required adjustments to the equipment until all performance requirements are met. The Supplier shall then perform all the necessary tests, in the presence of the local engineer designated by the Purchaser, in order to demonstrate the operation of the equipment in agreement with the specifications.

The Supplier shall perform assembly, installation, testing and commissioning of the equipment in the presence and with the collaboration of the future users.

13. Training

For the following items:

Lot # 4:

- Anaesthesia unit
- Autoclave, horizontal, single door
- Autoclave, tabletop
- Ceiling light, surgical,
- Complete dental chair
- Dental X-ray development unit
- Electrosurgical unit, general purpose
- Incubator, infant
- Light, surgical, mobile, with battery
- Oxygen concentrator

Lot # 5

- Spectrophotometer UV / visible

Lot # 6

- Basic radiological system
- Dental X-ray unit
- Scanner, ultrasonic, general purpose

Lot # 7

- Air-compressor machine
- Generator ,with accessories
- Kit HF, transceiver, bases station

The Supplier is requested to provide the necessary training in operation, maintenance and/or repair in order optimise the useful life of Goods.

5.1.4 Transport

5.1.4.1 The Existing Situation

This section reviews the present transport situation within the department.

5.1.4.1.1 Users of Transport Services

Principal users of transportation services include:

- Hospitals: presently three in number, Royal Victoria, Bansang and Farafenni. Plans are underway for the addition of another two in Bwiam and Serekunda.
- MaHCs and MiHCs: previously Major Health Centers, Minor Health Centers, Dispensaries and Sub-dispenaries. MaHCs serve as referral points for MiHCs.
- Divisional Health Teams: concerned mainly with public health issues and the implementation of the primary health care programs.
- Others such as Medical Headquarters, DoSH&SW, Schools, Maintenance Departments and Divisional Health Centres.

5.1.4.1.2 Organisation and structure

The Transport Unit along with the Building and Equipment Maintenance Units, Personnel Supplies and Finance, fall under the purview of the Director of Support Services whose functions are presently carried out by the Deputy Permanent Secretary.

The transport unit is responsible for the following:

- repair and maintenance of the transport fleet (including motor cycles);
- repair and maintenance of generators and other facilities such as fuel storage and dispensation machines;
- operation of vehicles for the transportation of drugs and other health material and equipment, and for the transfer of health personnel at the end or beginning of different assignments.

5.1.4.1.3 The vehicle fleet

The health sector transport fleet includes 103 four wheeled vehicles of which 36 are ambulances. The fleet comprises mainly Toyota Models (about 66%) and Land Rovers (20%). Average age is about 6.36 years[3] (see table below). About 11 % of the fleet are beyond economic repair; 38% are operating but with problems. Only 39% are considered road-worthy.

Table 1. Vehicle fleet Age distribution

Age (year of purchase)	Number
1986	1
1989	5
1990	7
1991	17
1992	7
1993	17
1994	7
1995	5
1996	16
1997	11
1998	3
Age unspecified	7

Table 2. Vehicle Condition

Vehicle Condition	Number	Percentage
Beyond Economical Repair	11	11.34
Boarded	3	3.09
Running with problems	37	38.14
Completely road worthy	38	39.18
Rehab	8	8.25

[3] These figure are computed from data supplied by Transport Unit of DoSH&SW

Number of motor cycles is about 172, predominantly of Yamaha manufacture with an average age of 3.3 years. Generator sets are 30 in number, and range from 10kVA to 300kVA.

With regard to the motor cycle fleet, the main make is Yamaha (60%), followed by Honda (35%). Average age is about 3.5 years and some 95% or so are in good operating condition.

Motor cycle age distribution

Year of purchase	Number
1990	1
1993	3
1994	2
1995	40
1996	34
1997	41
1998	12
1999	20
Unspecified age	22

5.1.4.1.4 Premises, Equipment and Plant.

There are 3 maintenance sites in Kanifing, Mansa Konko and Bansang.

Kanifing

The Kanifing site has a service yard of approximately 5,000 m^2 and a covered area of about 200m^2. Storage of vehicles written-off or scrapped reduces the amount of space available for repairs and general manoeuvring. Number of offices is insufficient, and personnel have to make do with improvised shelter such as old caravans.

The existing service pit is used as a store. There is an air compressor but the piping does not function so that use of air tools and spray painting is not possible. There is a general shortage of tools and equipment in the workshop: hand tools are either missing or worn out. Bench tools and welding machines are insufficient.

Mansakonko

Has a covered workshop area of about 50 m^2 which needs extending. There is a general shortage of tools and equipment in the workshop. As in Kanifing, hand tools are either missing or worn out. Bench tools and welding machines are insufficient.

Bansang

Covered workshop area is about 100$m^{2.}$ A security fence is required around workshop and storage facilities are needed also. The tools and equipment situation is as for the other sites.

5.1.4.1.5 Personnel

The approved estimate for 1999 puts maintenance personnel total at 29, with total salary of D262,562. Most of the staff is inadequately trained and the majority are semi-literate. Apart from the transport controller, there is only two other technical staff with some engineering training (GTTI) in the form of a City and Guilds Certificate. For existing scope of operations, these numbers are inadequate and staffs are frequently unable to take annual leave or are compelled to work outside normal working hours.

There are no welders, panel beaters or machinists. These services are out-contracted.

Personnel list: Transport unit

Position	Number	Salaries (Dalasi)
Transport Manager	1	26,856
Senior technical officers	4	62976
Stores Officer	1	20646
Foreman	1	13002
Technical Officers	6	42048
Trainee Technical Officers	1	7008
Assistant Stores Clerks	2	11568
Watchmen	2	1370
Tradesmen	11	77088
Sub Total (maintenance)	29	262,562
Senior Drivers	12	97752
Drivers	64	448512
Generator Operators	3	17352
Typist	1	7008
Sub Total	80	570624
Grand Total	109	833186

5.1.4.1.6 Summary

Key strengths and weaknesses of present situation are summarised below.

Strengths:

- A fairly standardised fleet: repair personnel have good knowledge of vehicles;
- A good system of maintenance organisation;
- A fairly good collection of information;
- A dedicated workforce responsive to the needs of the health system.

Weaknesses:

- Insufficient budgetary for spare parts and consumables and bureaucractised decision-making with regard to procurement: this leads to expensive parts purchase, chronic shortage of parts, cannibalisation, and the associated problems (extra work and tends to hidden real costs);
- Unfavourable conditions of service and work environment makes it difficult to hire and maintain trained personnel;
- Limited training opportunities, with limited possibilities for growth;
- Inadequate facilities, equipment and tools leading to sub-standard performance;
- Inconsistent fleet replacement plans leading to retention of vehicles beyond optimal life;
- Weak management information system for monitoring, control and decision making.

5.1.4.2 Norms and Standards

The policy framework for determining vehicle requirements at different levels of facilities is articulated in the health policy document (1994-2000). This document recognises that more than 50% of health services at the peripheral level are delivered on a mobile basis. In addition, the requirement for supervision by both divisional and central level exerts a great demand for a reliable transport fleet. Another important fact is that vehicles allocated to health centres serve purposes of evacuation, MCH trekking, supervision of primary health levels, drug supply and staff welfare generally.

5.1.4.2.1 Minimum Requirements

Type of Facility	Type of Vehicle	Quantity
Hospitals	Ambulance	1
	Utility (also used for evacuation)	1
	Total yearly maintenance cost (vehicles)	$2,675
Major Health Centres	Ambulance	1
	Utility/Trekking (also for evacuation)	1
	Motorcycles (Pool)	2 (pool)
	Total yearly maintenance cost (vehicles)[4]	$2905
Minor Health Centres	Ambulance	1
	Motorcycles	2 (pool)
	Total yearly maintenance cost (vehicles)	$1780
PHC Village	Bicycle	1

Bicycle to be provided to VDC at the inauguration of the PHC, but maintenance and replacement to be responsibility of VDC.
In addition all CHNs and officers such as Public Health Superintendents, leprosy/TB inspectors should also be provided with motor cycles.

5.1.4.2.2 Specifications

Specifications have been kept as simple and functional as possible. The Gambia experience has shown that sophisticated ambulances invariably loose their equipment to health centres. The operating conditions such as rough roads make it difficult to keep equipment in vehicles.

The specifications are based on manufacturers' conversion guides for special vehicles.

1. AMBULANCE

- Engine: Diesel, in line, 6 Cylinder Tropicalised.
- Clutch: Dry Single Plate Diaphragm
- Transmission: 5 Speed, 4-Wheel drive
- Shift Lever Position: Floor
- Steering: Left Hand Drive
- Brake Type: Front, Disc; Rear, drum
- Tyres: 750 X 16

[4] Yearly maintenance costs are based on 5% of investment value of transport unit

- Battery: 12V/70AH
- Tank Capacity: 90 litres
- Dimensions: Overall Length 5,400mm
- Overall Width 1800mm
- Overall Height 2600mm
- Wheel Base 2980mm
- Ground Clearance230mm
- Beacon Lamp: Front 35W (Blue)
- Electric Siren: With Amplifier and Speaker (1 Tone Type)
- Stretcher Type: Main W/ Caster, Sub stretcher, 2 folding
- Attendant Seat: Folding Type 4 Passengers
- Roof Lamp: Std + additional 10 W
- Floor: Plywood and Linoleum
- Fire: Fire extinguishers (1Kg)
- Identification: Blue Cross

2. UTILITY

- Engine: Diesel, Inline, 4-Cylinder, 2.8 litre
- Tropical Specifications
- Clutch: Dry Single Plate Diaphragm
- Transmission: 5-Speed, 4-Wheel Drive
- Shift Lever Position: Floor
- Tyres: 7.00-16-8PR
- Brakes: Front, Disc; Rear, Drum
- Battery: 12V/ 70AH
- Tank Capacity: 69 litres
- Dimensions: Overall Length 4,725mm
- Overall Width 1,690mm
- Overall height 1,785mm
- Wheel Base 2,860mm
- Steering: LHD Re-circulating Ball
- Suspension: Front, Double Wishbone and Torsion Bar Springs
- Rear, Rigid Axle, Leaf Springs

3. MOTOR CYCLES

- Engine Type: 2-Stroke single cylinder, 97cm^3
- Starting: kick-start
- Transmission: 5-speed
- Tyre: Front, 2.75-19-4PR
- Rear, 4.10-18-4PR
- Dimensions: Overall Length 2.110mm
- Overall Width 930mm
- Overall height 1,080mm
- Ground Clearance 235mm
- Fuel Tank capacity: 11litres
- Additional: Heavy Duty Carrier
- Brake and Clutch Lever Guards
- Sealed Brake System (against water and dirt)
- Fully Enclosed Chain Cover (to protect against water, dirt and rough terrain)
- Rugged Skid Plate (for under frame protection)

Average cost of Ambulance	$31000
Average cost of Utility	$22500
Average Cost of Motorcycle	$2300

5.2 INVESTMENT PROGRAMME

5.2.1 Civil works

The National Health Policy mandates the DoSH with co-ordination of all investment activities in the sector including interventions by various donors. The policy also highlights primary health care as the focus and main thrust of interventions. In line with this policy, it must be ensured that there are adequate facilities for delivery of PHC services. The NHP also delineates an orientation toward “consolidation of existing services to ensure optimum functionality to improve quality care, effectiveness and efficiency”. Consequently, it is recommended that existing health facilities are rehabilitated and upgraded at an early stage.

Subsequently, at a second stage, “selective expansion of services to ensure better coverage and access” should be embarked upon. This investment programme is for a 10-year cycle overall, beginning with a 5-year programme.

5.2.1.1 Number of Facilities

5.2.1.1.1 Trekking stations

Effective provision of primary care is considered key to the success of the health delivery system. The total number of existing trekking stations is 196, all of which are in a poor state. Construction of more of these facilities nationwide plus rehabilitation of existing is required, albeit not part of this IDA-funded programme. The trekking facility is a simple lockable room, size 3.0x 3.0m, with an adjacent covered waiting area. It is desirable to have two adjacent rooms for consultation during trekking days. This facility is used once a month if it is not located in a key village and once a week if thus located. The office is also put to storage and administrative use. Local materials and building techniques can be used for construction. Based on activity, the hygiene requirement for such facility is low, hence a high quality building with expensive finishes is not necessary. All that is required is a structure that is durable.

In view of the occasional use of the trekking station and the simplicity of the construction required, it is proposed that these facilities are provided by the communities using their own resources. This makes it possible for such a facility to accommodate other community activities.

5.2.1.1.2 Minor Health Centre

Initial estimates indicate that 90 MiHCs are required: some with nursing quarters, others without. Each MiHC shall have 2 staff quarters. It is proposed that the main thrust of the initial investment focus on these facilities which provide support and logistics for PHC villages and reduce the burden on referral health facilities.

5.2.1.1.3 Major Health Centre

One MaHC per division is generally required. However, population figures and access conditions require 2 facilities in WD: a new MaHC in Brikama, while the Bwiam facility is already in place.

NBD is restructured into one administrative unit. However, DoSH deem it necessary to have a MaHC in Essau. This option is not included in planning and costs projections.

5.2.1.1.4 Hospital

No new hospital facility is recommended during the 10-year investment programme.

5.2.1.2 Other Interventions in the Health Sector

The investment programme will depend on local resources coupled with funds available from bilateral and multilateral donor agencies. The following Agencies have expressed interest in assisting development of the sector.

Agency	Project Description	Area covered
World Bank IDA	Rehabilitation & new construction of primary & secondary health facilities	Nation wide (to be decided)
African Development Bank	Rehabilitation of Secondary health facilities	Nationwide: (Basse & Kuntaur MaHC, Fatoto, Kiang Karantaba &Yorobawol MiHC, Brufut dispen pensary, Central Medical Stores, Public Health lab
Islamic Development Bank	Construction of Soma HC and Serre kunda Hospital	LRD & KMC
Libyan Government	Construction of Bwiam Hospital	WD
Italian Government	Rehabilitation and New construction of Secondary health facilities in NBD	North Bank (ie Illiassa, Ngayen Sangal, Medina Bafuloto, Kuntair, Salikene, Kerewan
Japanese Government	Construction of a 300 bed childrens hospital in Serrekunda.	Nationwide
European Union	EDF	NB/WD/URD (depends on village initiative and priority)

Source; DoSH

5.2.1.3 Priority areas

- Dilapidated dispensaries and minor health centres nationwide to be upgraded to new MiHCs
- Brikama Major Health centre

5.2.1.4 Cost Estimates

5.2.1.4.1 Major Health Centres

Division	Major Health Centres	Description	(US) $
URD	BASSE MaHC	New 120 bed facility	2,414,144.40
CRD	KUNTAUR MaHC	New 30 bed facility	1,462,234.52
LRD	SOMA MaHC	additional medical & support services	496,153.46
NBD	KEREWAN MaHC	New 30 bed facility	1,386,601.70
	ESSAU MaHC*	New 30 bed facility	1,386,601.70
WD	BWIAM MaHC	Minor alterations to new facility	224,154.65
	BRIKAMA MaHC	New 120 bed facility	2,120,248.56
KMC	SERREKUNDA MaHC	Additional 120 bed wards	854,788.00
	TOTAL		**$10,344,926.99**

*Optional

5.2.1.4.2 Minor Health Centres

Division	Location	Minor Health Centres	Descrip	no.	(US) $
URD	*1.15*	YORROBAWOL**	45 bed	1	
		NEW MiHC		11	
		REHAB. &/or EXTEND EXISTING FACILITY		5	
CRD	*1.12*	NEW MiHC		6	
		REHAB. &/or EXTEND EXISTING FACILITY		8	
LRD	*1.06*	NEW MiHC		2	
		REHAB. &/or EXTEND EXISTING FACILITY		4	
NBD	*1.10*	NEW MiHC		10	
		REHAB. &/or EXTEND EXISTING FACILITY		7	
WD	*1.02*	NEW MiHC		9	
		REHAB. &/or EXTEND EXISTING FACILITY		6	
KMC &	*1.00*	NEW MiHC		15	
BCC		REHAB. &/or EXTEND EXISTING FACILITY		5	
		TOTAL		**89**	**$24,439,194.95**

** This is the only MiHC with in-patients.

5.2.1.4.3 New Trekking Stations

Division	Location	description		no.	(US) $
URD	*1*	Trekking Stations		60	374,400.00
CRD	*1*	Trekking Stations		75	468,000.00
LRD	*1*	Trekking Stations		40	249,600.00
NBD	*1*	Trekking Stations		65	405,600.00
WD	*1*	Trekking Stations		75	468,000.00
KMC &	*1*	Trekking Stations		0	-
BCC					
Extra for Village Health Posts that are not located in a Key Village				53	56,700.00
		TOTAL		**368**	**$1,965,600.00**

Assumptions:

1. Each MiHC supports six trekking stations or VHP in a Key Village.
2. Costs based on 3 consulting rooms.

Notes on Estimates

1. Equipment, furniture and consultancy fees are excluded;
2. Estimates are based on duty free prices;
3. Works are assumed to be carried out by Gamworks registered Contractors (except for trekking stations to be constructed by local contractors operating within administrative division).

Detailed costs are attached in annexes.

5.2.1.5 Phasing & Implementation Plan

The proposed phasing of implementation is based on the NHP emphasis on "consolidation of existing services to ensure optimum functionality to improve quality care, effectiveness and efficiency". In this respect rehabilitation of existing health facilities is included in the first phase, a period of 5 years. Increased coverage and better access to the delivery system through new additional facilities is planned for the second phase, another 5-year period.

Total investment is spread over the ten year period allowing for an inception year with less output, and allowing as well for contingencies in the last year in terms of increased costs and delays. Implementation is based on fund availability and management capacity of the relevant parties, but is primarily driven by capacity of the local building industry. This is limited. Consequently, the workload should be realistic with an accent on continuity and avoidance of undue burden on the industry. At the same time, it should induce systemic capacity building in terms of management, expansion, diversification, flexibility, sophistication, and so forth.

Contracts are to be tendered in small lots to allow medium class contractors (B&C) to compete for rehabilitation of MiHC's. This serves to nurture the capacity of medium-sized establishments during phase 1, so they are able to compete for larger, new construction, contracts during the subsequent phase.

The project must also take continuity of care into account. It is unlikely that the extensive rehabilitation of existing facilities and concomitant suspension of existing operations can be embarked on without negatively impacting access to acre during works implementation. To minimise that situation, it is proposed that 10 new MiHCs are constructed in strategic locations during the 1st year so that some degree of care is accessible in each division throughout the rehabilitation works in years 2 to 5. Once the rehabilitation phase is completed, the remainder of MiHC's can be constructed during years 5 - 10 for nationwide coverage and access. In summary, a sequence of strategic construction (year 1), consolidation of existing (years 2-5), and general expansion (years 5 -10) is proposed.

New MaHC's are also prioritised with Brikama, Basse, Kerewan, and Kuntaur to be operationalised during the first 5 years and the additional requirements for Serrekunda, Soma and Bwiam provided during the second. These 3 facilities would have already been operational during the first phase and are more or less in compliance with the MPA. Bwiam is not far-off completion and Soma has already achieved practical completion and is in the possession of the DoSH. Serrekunda is still at the design stage and is generally in line with programmed CPA. On-site works are programmed for November 2000.

Because of limited industry capacity and given the significant scale of MaHCs,, construction of these should be sequenced in time. Brikama and Basse are considered highest priority, and are to be constructed first.

Most villages do not have the financial resources to construct such simple facilities. Such villages could be linked with NGO's or philanthropic organizations to assist them through village development committees. In order to utilise such resources to the maximum, all the information required to construct a trek station should be made available to communities including prototype drawings, diagrams, etc.

I M P L E M E N T A T I O N S C H E D U L E

Division	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
	MINOR HEALTH CENTRES									
	Constr. of 10 MiHCs	REHABILITATION OF 36 Nos. MiHCS				CONSTRUCTION OF 53 Nos. NEW MiHCs				
URD	2	1	1	1	2	2	2	2	2	1
CRD	2	2	2	2	2	1	1	1	1	
LRD	1	1	1	1	1	1				
NBD	2	1	2	2	2	2	2	2	1	1
WD	2	1	1	2	2	2	2	1	1	1
KMC	1	1	1	1	2	2	3	3	3	3
TOTAL	**10**	**7**	**8**	**9**	**11**	**10**	**10**	**9**	**8**	**6**
				YOROBAWOL						
	MAJOR HEALTH CENTRES									
URD		BASSE								
CRD				KUNTAUR						
LRD									SOMA	
NBD				KEREWAN						
WD		BRIKAMA								BWIAM
KMC										SERREKUNDA
Optional	ESSAU									

5.2.1.6 Construction industry

5.2.1.6.1 Current projects and Contractors capacity

Major Projects Scheduled to begin in 2000

Project	Finance	Total – US$	Years	Works/yr - US$
PHPNP	IDA	2,900,000	1	2,900,000
HSDP	ADB	4,500,000	2	2,250,000
Education III	IDA	2,600,000	1	2,600,000
Gamworks II	IDA/OPEC	16,700,000	4	4,170,000

Current Capacity of Local Contractors

Class	Number of contractors	Limit of contract sum –	Total Capacity – US$
A	14	Varies	17,250,000*
B	21	166,000	3,486,000
C	59	83,000	4,897,000
D	296	42,000	12,432,000**

*Consultants estimate

**Class D capacity is partly reflected in Class as it is the main pool for sub-contracting. Tasks for Class D contractors should be simple structures such as fences and external works. Greater supervision is required with works management

Year 2000 Estimate of Works Distribution

Class	Project	Finance	Total – US$	Contractor Capacity
A	PHPNP	IDA	0	
	HSDP	ADB	2,240,000	
	Education III	IDA	0	
	Gamworks II	IDA/OPEC	540,000	
			2,780,000	**17,250,000**
B	PHPNP	IDA	1,800,000	
	HSDP	ADB	0	
	Education III	IDA	1,560,000	
	Gamworks II	IDA/OPEC	2,330,000	
			5,690,000	**3,486,000**
C	PHPNP	IDA	1,100,000	
	HSDP	ADB	0	
	Education III	IDA	730,000	
	Gamworks II	IDA/OPEC	1,250,000	
			3,080,000	**4,897,000**
D	PHPNP	IDA	0	
	HSDP	ADB	0	
	Education III	IDA	310,000	
	Gamworks II	IDA/OPEC	40,000	
			350,000	**12,432,000**

Gamworks Agency has significant experience working with class B & C contractors. 56% of the Gamworks I workload was executed by class B contractors, and 30% by class C. Class A, not specifically targeted, did 13% of the works. Based on these indicators, above projections were tabulated. It indicates a 50% shortfall in total capacity of categories B & C for year 2000. Gamworks are to examine the possibility of building the capacity of these contractors to allow execution of the envisaged works.

The following alternatives warrant some thought:

- delay execution until current workload reduces;
- utilise available capacity of class A.

The register of consultants has about 10 firms with civil works expertise. These firms are not classified. Among these, Gamworks will select consultant(s) to supervise the construction of the works. Also, consultant(s) will be required to prepare bidding documents for 10 new MiHCs based on the standard prototypes prepared as part of this study.

5.2.2 Equipment

The study terms of reference requires that the Consultant assists DoSH in preparation of a preliminary investment program for 5 and 10 year cycles. This, *inter alia*, should:

- determine the equipment life span;
- estimate for every type of health facility costs of replacement at the end of life cycle;
- estimate budget for routine replacement of materials.

The replacement budget was determined on the hypothesis that all existing equipment should be replaced. In the absence of a comprehensive quantitative and qualitative inventory of existing, it is not possible to factor in current equipment. Estimation of a replacement budget will be possible only when such an inventory is available and total numbers in every category of health facility is known. Nonetheless, the tables below contribute to elaboration of an investment plan for the minor and major health centres.

For an initial investment in equipment of 10,479 dollars (in year 1), the total cost of replacement in a MiHC is $439 in year 6, $2,240 in year 8 and $8,039 in year 11. For the Yorobawol MiHC, because of the presence of the surgical unit, costs are more important: here, with an initial equipment investment of 45,699 dollars, the total cost of replacement is $11,939 in year 6, $14,160 in year 8, and $31,539 in year 11.

As regards MaHCs, for an initial investment of $ 265,469, the cost of replacement will be $ 50,980 in year 6, $ 104,760 in year 8 and $ 160,709 in year 11.

The investment plan should take in account investments made by the various donors. At the moment, formal commitments were made by some of them for the equipping of certain health facilities. The following table inventories these investments.

Planned investment

Donor	**Facility name**	**Division**	**District**	**Type of intervention**
AfDB	Basse	Upper River	Fulladu East	Rehabilitation / equipment
AfDB	Fatoto	Upper River	Kantora	Rehabilitation / equipment
AfDB	Kiang Karantaba	Lower River	Kiang West	Rehabilitation / equipment
AfDB	Yorobawol	Upper River	Wuli	Rehabilitation / equipment
AfDB	Brufut	Western	Kombo North	Rehabilitation / equipment
AfDB	Kuntaur	Central River	Niani	Rehabilitation / equipment
Italian Coop.	Illiassa	North Bank	Upper Badibu	Rehabilitation / equipment
Italian Coop.	Ngayen Sanyal	North Bank	Upper Badibu	Rehabilitation / equipment
Italian Coop.	Medina Bafuloto	North Bank	Upper Nuimi	Rehabilitation / equipment
Italian Coop.	Kuntair	North Bank	Jokadu	Rehabilitation / equipment
Italian Coop.	Salikene	North Bank	Central Badibbu	Rehabilitation / equipment
Italian Coop.	Kerewan	North Bank	Lower Badibbu	Rehabilitation / equipment
IDB	Soma	Lower River	Jarra West	New facility
IDB	Serrekunda	Kanifing Municiplity		New facility
Libyan	Bwian	Western	Foni Kansala	New facility

Table 1 : Equipment replacement cost – Minor Health Centre

Designation	Quantity	**Unit Price**	**Total price**	**Life span**	**Year 1**	**Year 6**	**Year 8**	**Year 11**
		(U$)	**(U$)**					
Weighing scale, infant	1	165	165	5	165	165	0	165
Stove	2	62	124	5	124	124	0	124
Refrigerator	1	1 100	1 100	10	1 100	0	0	1 100
Steam steriliser	1	800	800	10	800	0	0	800
Aspirator foot operated	1	150	150	5	150	150	0	150
Foetal heart detector	2	900	1 800	7	1 800	0	1 800	0
Resuscitator, pulmonary, child	1	390	390	7	390	0	390	0
Manual centrifuge	1	250	250	7	250	0	250	0
Microscope binocular	1	900	900	10	900	0	0	900
Autoclave, tabletop	1	800	800	10	800	0	0	800
Kit HF, transceiver, base station	1	4 000	4 000	10	4 000	0	0	4 000
		Total	**10 479**		**10 479**	**439**	**2 440**	**8 039**

Table 2 : Equipment replacement cost – Yorobawol Minor Health Centre

Designation	Quantity	Unit Price	Total price	Life span	Year 1	Year 6	Year 8	Year 11
		(U$)	(U$)					
Weighing scale	1	165	165	5	165	165	0	165
Stove	2	62	124	5	124	124	0	124
Refrigerator	1	1 100	1 100	10	1 100	0	0	1 100
Steam steriliser	1	800	800	10	800	0	0	800
Aspirator, foot operated	1	150	150	5	150	150	0	150
Foetal heart detector	2	900	1 800	7	1 800	0	1 800	0
Resuscitator, pulmonary, manual, child	1	390	390	7	390	0	390	0
Centrifuge, manual	1	250	250	7	250	0	250	0
Microscope, binocular	1	900	900	10	900	0	0	900
Autoclave, tabletop	1	800	800	10	800	0	0	800
Kit HF, transceiver, base station	1	4 000	4 000	10	4 000	0	0	4 000
Scrub sink – one station	1	1 650	1650	7	1 650	0	1 650	0
Anaesthesia unit	1	6 000	6000	7	6 000	0	6 000	0
Surgical aspirator, mobile	1	1 450	1450	7	1 450	0	1 450	0
Air-conditioning unit	1	920	920	7	920	0	920	0
Oxygen concentrator	1	2 000	2000	10	2 000	0	0	2 000
Light, surgical, mobile, with battery	1	5 500	5500	5	5 500	5 500	0	5 500
Operating table	1	6 000	6000	5	6 000	6 000	0	6 000
Steriliser, dry heat	1	1 700	1700	7	1 700	0	1 700	0
Autoclave, vertical, 90 litres	1	10 000	10000	10	10 000	0	0	10 000
					45 699	**11 939**	**14 160**	**31 539**

Table 3 : Equipment replacement cost – Major Health Centre

Designation	Quantity	Unit price	Total	Life span	Year 1	Year 6	Year 8	Year 11
Air-compressor machine	1	1 000	1 000	5	1 000	1 000	0	1 000
Air-conditioning unit	3	920	2 760	7	2 760	0	2 760	0
Anaesthesia unit	2	6 000	12 000	7	12 000	0	12 000	0
Aspirator, foot operated	2	150	300	7	300	0	300	0
Aspirator, uterine	1	5 200	5 200	5	5 200	5 200	0	5 200
Autoclave, horizontal, single door	1	25 000	25 000	10	25 000	0	0	25 000
Autoclave, tabletop	3	800	2 400	5	2 400	2 400	0	2 400
Basic radiological system	1	35 000	35 000	10	35 000	0	0	35 000
Blood bank	1	1 500	1 500	5	1 500	1 500	0	1 500
Bunsen burner	1	60	60	10	60	0	0	60
Ceiling light, surgical,	2	6 000	12 000	7	12 000	0	12 000	0
Complete dental chair	1	15 000	15 000	7	15 000	0	15 000	0
Computer	2	1 500	3 000	7	3 000	0	3 000	0
Culture incubator	1	1 700	1 700	7	1 700	0	1 700	0
Dental X-ray development unit	1	2 100	2 100	7	2 100	0	2 100	0
Dental X-ray unit	1	3 900	3 900	7	3 900	0	3 900	0
Distilling unit – 2 litres per hour	1	1 700	1 700	5	1 700	1 700	0	1 700
Drier	1	2 000	2 000	10	2 000	0	0	2 000
Electric centrifuge	1	1 100	1 100	5	1 100	1 100	0	1 100
Electric iron	2	25	50	10	50	0	0	50
Electronic timer / chronometer – acoustic alarm	1	94	94	10	94	0	0	94
Electrosurgical unit, general purpose	2	5 000	10 000	10	10 000	0	0	10 000
Foetal heart detector	4	900	3 600	7	3 600	0	3 600	0
Generator ,with accessories	1	11 000	11 000	10	11 000	0	0	11 000
Haemoglobinometre	1	500	500	10	500	0	0	500
Incubator, infant	2	5 000	10 000	7	10 000	0	10 000	0
Kit HF, transceiver, bases station	1	4 000	4 000	7	4 000	0	4 000	0
Light inactiving	1	320	320	10	320	0	0	320
Light, examination	7	185	1 295	5	1 295	1 295	0	1 295
Light, surgical, mobile	1	4 600	4 600	10	4 600	0	0	4 600
Light, surgical, mobile, with battery	4	5 500	22 000	5	22 000	22 000	0	22 000

Manual centrifuge	1	250	250	10	250	0	0	250
Microscope binocular	2	900	1 800	7	1 800	0	1 800	0
Minor operating table	1	4 000	4 000	7	4 000	0	4 000	0
Mobile surgical aspirator	1	1 450	1 450	10	1 450	0	0	1 450
Operating table	2	6 000	12 000	5	12 000	12 000	0	12 000
Oxygen concentrator	2	2 000	4 000	10	4 000	0	0	4 000
Precision balance	1	2 145	2 145	5	2 145	2 145	0	2 145
Refrigerator	3	1 100	3 300	10	3 300	0	0	3 300
Resuscitator, pulmonary, manual, adult	4	320	1 280	10	1 280	0	0	1 280
Resuscitator, pulmonary, manual, child	3	390	1 170	10	1 170	0	0	1 170
Scanner, ultrasonic, general purpose	1	15 000	15 000	7	15 000	0	15 000	0
Scrub sink – one station	1	1 650	1 650	7	1 650	0	1 650	0
Sewing machine	2	500	1 000	7	1 000	0	1 000	0
Solar lamp	2	150	300	5	300	300	0	300
Spectrophotometer UV / visible	1	2 500	2 500	7	2 500	0	2 500	0
Sphygmomanometer	8	30	240	5	240	240	0	240
Steriliser, dry heat	1	1 700	1 700	7	1 700	0	1 700	0
Surgical aspirator, mobile	3	1 450	4 350	7	4 350	0	4 350	0
Tension stabiliser for spectrophotometer	2	400	800	7	800	0	800	0
Ventilator	1	100	100	5	100	100	0	100
Wall sphygmomanometer	1	100	100	7	100	0	100	0
Washing machine	1	1 500	1 500	7	1 500	0	1 500	0
Weighing scale with measuring road, adult	3	140	420	10	420	0	0	420
Weighing scale, infant	3	165	495	10	495	0	0	495
X-ray film processor, manual	1	7 000	7 000	10	7 000	0	0	7 000
X-ray viewing box – 2 panels	6	290	1 740	10	1 740	0	0	1 740
			265 469		**265 469**	**50 980**	**104 760**	**160 709**

5.2.3 Transport

A fleet replacement policy should be adopted. This will ensure a regular addition of new fleet and the de-commissioning of old fleet after a predetermined period. The period (economic life) will depend on operating and maintenance conditions, which can be assessed after a period of information gathering. An economic life of 5 years for 4-wheeled vehicles and 3 years for motorcycles may be reasonable for our situation. As justification for replacement, availability and utilisation ratios and the cost of maintenance and operation of the vehicle should be given.

Using an average economic life of 5 years and assuming an average cost of $31,000 for ambulances, the investment requirements for the next five years will be as below.

Year	2000	2001	2002	2003	2004	Total
New needs	5	5	5	5	5	
Number to be de-commissioned	19	12	6	0	0	
Total additional needs	24	17	11	5	5	
Cost @ $31,000	744000	527000	341000	155000	155000	1922000

6 Maintenance

6.1 INTRODUCTION

The Gambia health system is in the process of full development with the articulation of a health structure and the location of different categories of health facilities. In parallel with those developments, it is necessary also to define a national policy with regard to maintenance of infrastructure and equipment.

The country's economic crises resulted in a significant decrease to the health budget and to capital allocated for maintenance of infrastructure and equipment. The technical skills with which maintenance problems are to be resolved are also inadequate. In its present dispersed configuration, maintenance units are unable to meet the demands of the sector: equipment has deteriorated and the facility infrastructure has been left to disrepair.

Proper management of health assets is the main objective of a National Policy for Engineering and Maintenance that would define the basis of this management including the setting of technical standards, criteria for choice of equipment, organisation of maintenance workshops, etc.

The maintenance policy was supposed to be prepared in close co-ordination with AfDB. However, there has been no activity in the maintenance sector and the Consultants were informed that AfDB interventions will be co-ordinated with that of IDA.

Estate maintenance

There is an enormous discrepancy between the quality of building and level of maintenance: the former is generally high as evinced in the RVH, Bansang Hospital, Farafenni Health Centre and Sukuta Health Centre among others, while the latter is extremely low. The explanation may be that capital investment generates a very visible

output in the form of buildings, equipment, vehicles, etc. In comparison, maintenance investment does not have visible outputs. The very essence of maintenance is invisibility of malfunctioning or wear and tear. The exception to this is painting which, consequently, appears quite popular as evidenced in Bansang Hospital, Sukuta and Farafenni, 3 facilities that suffer from severe lack of other forms of maintenance. A new approach to maintenance, therefore, requires reversal of the existing perception.

Health facilities are often regarded as buildings only: the grounds around buildings attract little attention and remain bare without much landscaping. Paradoxically, this element accommodates much activity: waiting escorts, patients, expectant mothers, etc.; in Sukuta Health Centre, consultation was taking place under a large tree. Medical facilities should be regarded holistically: as a space where grounds are equally important in creating a comforting and comfortable environment especially as lower levels of investment and maintenance inputs are required.

6.2 LEVELS OF MAINTENANCE

There are different levels of maintenance. A tabular classification is developed in the next page.

6.3 THE EXISTING SITUATION

6.3.1 Health maintenance policy: the strategic framework

The National Health Policy 1994 - 2000 attaches a great importance to maintenance of assets. The policy seeks to ensure that essential, safe and cost-effective maintenance is made available at a price that the country can afford. It anticipates provision of the necessary support within a prescribed organisational framework with clearly defined targets and indicators. It also emphasises administrative decentralisation. Decision-making and control of resources must be as close as possible to the operational level for effective and efficient delivery of services. The proposed National Policy for Engineering and Maintenance is designed in line with these objectives. First, weaknesses in the existing systems are identified, analyzed, and a framework for new NPE&M outlined.

6.3.2 The existing maintenance system

6.3.2.1 Structural aspects

Equipment and infrastructure maintenance is accorded low priority in the delivery of health services. Resources are provided for maintenance and replacement of equipment and infrastructure at extremely low levels.

6.3.2.1.1 <u>The Central level</u>

In theory, the DoSH Directorate of Support Services should manage maintenance. Within the directorate, 2 units are directly engaged in maintenance related activities: Transport and Maintenance for vehicles and buildings and equipment respectively.

Level	**LEVELS OF MAINTENANCE** Infrastructures and estates	Equipment
1	To be executed by the user. These are simple actions for easily accessible elements of buildings, machinery or equipment. They don't require special technical equipment other than the integrated tools that come with equipment for use by user. Actions include checking, replacement of consumables, cleaning, etc.	Simple actions necessary for operation that can be carried out on easily accessible elements in complete safety using support equipment integrated into item. For example, regulation and control or inspection necessary for good functioning; elementary preventive maintenance, replacement of consumable goods or accessories (cords, batteries, etc.). In some cases, this type of operation can be done by the user of the equipment with support equipment integrated into material following use instructions.
2	To be executed by unskilled staff. These comprise simple actions but which require procedures or techniques. They also require use of basic technical equipment like ladders screwdrivers, etc. Typical activities are regular maintenance of gardens, joinery, plumbing, roofs, etc.	These are actions that require simple procedures and / or support equipment (integrated into item or outside of it). The support equipment is easy to use and operate. It includes, for example, control of performance, regulation, or repair by standard exchange of subsets. Second level maintenance activities can be carried out by an informed staff who is familiar with maintenance procedures.
3	To be executed by skilled staff. These comprise complex activities that require procedures and techniques such as fine tuning, replacement of spare parts, repairs, etc. They include painting, replacing taps, repairing locks, etc.	These operations require complex procedures and complicated support equipment as in general regulations, delicate systematic maintenance operations, repairs by exchanges of subsets and/or of constituents. This type of operation can be done by a qualified technician following detailed procedures and instructions in maintenance manuals.
4	To be executed by fully qualified technicians or artisans. These actions require complex procedures and techniques such as rewiring, re-roofing, renewing plumbing installations, replacing window frames, welding, etc.	Operations procedures that require mastery of a technique or particular technology and/or the use of specialised support equipment. For example, repairs by replacement of subsets and of constituents, specialised repairs, check of equipment, etc. It generally includes all corrective and preventive maintenance items. A specialised technician with maintenance instructions can perform these operations.
5	N/A	Operations procedures that imply specialist know-how based on particular technologies, processes and / or equipment. By definition, these types of maintenance activities (renovation, reconstruction, etc.) are performed by the supplier or by a specialised company.

In practice, maintenance activities are fragmented over various departments with little co-ordination among them. It is viewed as an under-skilled cluster of activities with few qualified staff, and its activities are generally not linked to national health priorities and programmes.

The maintenance units of hospitals answer to the Chief Executive Officer, to Hospital Boards and ultimately to the Permanent Secretary, DoSH. This set-up is far too centralised to achieve committed and efficient maintenance activities at all levels.

At present the workshops do not function optimally reasons for which can be attributed to several factors: chronic shortage of funds, insufficient technical skills, absence of a national maintenance policy and weak planning skills. There is no comprehensive database of health assets and their state of repair. The maintenance budget is grossly insufficient. For 1999, it was D1.4m for all maintenance activities including buildings and equipment and the budget for the latter was not itemised.

Shortage of maintenance staff has translated to *ad hoc* delivery of services at the level of facilities. Difficulties in establishing guidelines for timely preventive and curative maintenance has resulted in serious dilapidation of the majority of health facilities, including staff houses and equipment.

In summary, apart from RVH and the transport unit both which perform relatively well in spite of limited resources, the DoSH capacity to maintain infrastructures, equipment and transport is poor due to insufficient resources in terms of:

- staff;
- financial resources;
- infrastructure;
- plant, equipment and tools.

6.3.2.1.2 Royal Victoria Hospital

The maintenance unit operates within the hospital grounds and is responsible for all building and biomedical equipment maintenance. It also undertakes site supervision, manages out-contracting of construction works, and undertakes construction work itself. Detailed statistics of budgets and works executed are not available.

The efficiency of the unit is hampered by:

- high dependency on a bureaucratised financial system that causes delays and discourages fast track procedures;
- insufficient funds;
- uncertainty about available funds does not allow long term planning;
- insufficient project management capability in terms of staff and office equipment;
- insufficient professional capabilities in terms of staff qualification, training, manual and equipment;
- inadequate premises in terms of workshops, work yard, office and storage space.

The facility that deals with primary and secondary levels of maintenance is located in Kanifing (see below), near the Transport Maintenance Unit. There are no performance statistics available.

Performance of the RVH maintenance unit is below standard largely due to insufficient resources. However, its performance is a significant improvement on the Bansang Hospital unit which has virtually zero resources.

6.3.2.1.3 Kanifing

The central maintenance workshop is based in Kanifing. The unit is staffed by 13 unqualified technicians. 4 electricians perform equipment maintenance, mainly of the cold chain variety. In fact, the RVH engineering department handles higher level maintenance activities.

A new building for the unit was commenced, but works have since halted. When completed, the new structure is to accommodate all the activities of the central workshop, including building and equipment maintenance. The longer term objective is to centralise transport maintenance, primary and secondary level building and biomedical equipment maintenance, and the central medical store on the Kanifing premises. With a total built area of $80m^2$, space allocation is woefully inadequate, but represents some progress on the existing situation (a container is now utilised as central workshop).

The unit operates without tools or basic maintenance equipment.

6.3.2.1.4 Bansang

The hospital has a maintenance unit that undertakes building and furniture maintenance. It also contributes to biomedical equipment maintenance to a limited extent. There are no performance statistics available but it can be deduced –as with the RVH—that efficiency is hampered by:

- high dependency on the bureaucratised financial system as above;
- insufficient funds;
- uncertainty about available funds, which doesn't allow long term planning;
- insufficient project management capability in terms of staff and office equipment;
- insufficient professional capabilities in terms of staff qualification and training;
- inadequate premises in terms of workshops, work yard, office space and storage.

6.3.2.1.5 Medical Research Council (MRC)

The MRC has a department of engineering that maintains assets such as buildings, equipment, vehicles, computers, etc. The department has 2 British engineers, 3 biomedical technicians, 3 specialists in refrigeration, air conditioning and cold chain, 10 electricians, 6 carpenters, 4 plumbers and 5 motor technicians.

The Instrumentation and Electronics Unit currently has 3 technicians and intends to recruit an additional 2. Technicians perform maintenance on electronic material, instrumentation, and telecommunication equipment.

The following materials can be repaired in-house:

- Radiology equipment
- Microscopes
- Centrifuges
- Electronic scales
- Endoscope disinfectors

- UPS
- Water baths
- Hot oven
- Oxygen concentrators
- Water distillation plants
- Dryers (radiological films)
- Laboratory incubators
- Pumps
- Magnetic agitators
- Automatic cell counters
- Electrophoresis devices
- Autoclaves
- Spectrophotometers.

The department does not have an equipment inventory so that organisation of preventive maintenance is difficult. Maintenance of more sophisticated equipment is subcontracted to the private sector, largely based in Nigeria. Problems that cannot be resolved in-house are referred to manufacturers with whom MRC maintains permanent contact.

The department is potentially interested in the training of biomedical technicians.

6.3.2.1.6 Private sector

There is no private capacity in biomedical equipment maintenance.

6.3.2.2 Functional aspects

There are very few routinised maintenance procedures. When implemented, they are neither well co-ordinated nor comprehensive in scope. Additionally, existing procedures endure much red tape which induces insensitivity and lack of motivation.

Maintenance is generally performed on breakdown bases only, with little or no preventive maintenance. The RVH and transport units have operationalised a planned preventive maintenance programme which consists of a list and a schedule. However, there is no feedback, no collection or processing of data, and nothing of a management instrument. The RVH unit does not keep a record of work turnover.

Bansang as well as primary and secondary level building and biomedical equipment maintenance units have no planned maintenance procedures.

6.3.2.3 Policy and Strategy

6.3.2.3.1 Private vs. Public Sector Maintenance Capacity

Much of the administrative and commercial activities take place in and around the greater Banjul area. In order to revert the urbanisation process, GOTG has launched a decentralisation policy: provincial growth points have been established and administrative and budgetary autonomy is being devolved to divisions and Area Councils. At this early stage, however, private enterprise is yet to find a significant foothold in rural areas.

The GOTG must be supportive of –indeed instrumental in-- establishing and consolidating private sector economic activity in rural communities. In the long run, out-

sourcing a number of activities should be foreseen. Maintenance is one of those activities for the following reasons:

- Competition will improve quality of delivered services and cost reduction;
- Swifter response to demand;
- Possible better performance compared to the public sector;
- No DSH&SW capital investment required;
- Entrepreneurial commitment;
- Flexibility in capacity when required.

For now, no provincial private maintenance capacity is in place. Consequently, a more realistic scenario that retains maintenance activities in the public sphere is proposed for the short-term. Administrative structures and operations procedures are designed for reconfiguration as required in the long term.

6.4 THE NATIONAL MAINTENANCE POLICY

6.4.1 National Policy for Engineering and Maintenance (NPfE&M)

6.4.1.1 General objective

The primary objective of the NPfE&M is to ensure permanent protection of investments made in terms of equipment and infrastructure through better economic planning of purchases, works (construction and rehabilitation), and maintenance;

Protection of these investments will be effective only if necessary resources (human, financial and material) are made available so that activities required can be performed.

6.4.1.2 Specific objectives

1. Articulate National Policy for Engineering and Maintenance that incorporates the main policy initiatives of the DoSH (decentralisation, health priorities, health pyramid, minimum package of activities, etc.);
2. Institute rigorous co-ordination of the different sectors involved in maintenance (buildings, equipment, vehicles);
3. Reduce rates of deterioration, losses in capital investments, as well as operating costs of material resources of health system;
4. Increase the life cycle of infrastructure and equipment;
5. Improve productivity of technical services.

6.4.2 Strategies for Improved Maintenance

To reach and operationalise objectives, the NSE&M should be strengthened and have the necessary resources. The following strategies constitute the basic prerequisites in this development:

6.4.2.1 Strategy 1: Organise and strengthen the National System of Engineering and Maintenance (NSEM)

The NSEM should comprise a network of interventions in which every level of maintenance should have a precise profile of tasks to perform. The organisation, placing and supervision of this system as inextricable unit should be completed as soon as possible. This is a prerequisite for other strategies connected to engineering and maintenance functions. Two organisational aspects will be examined: structure and function.

STRUCTURE

Central level

The team recommends the creation of a new Directorate within the DoSH: The Directorate of Engineering and Maintenance (DEM). The unit should be adequately staffed, report directly to the Permanent Secretary and consist of three units:

- equipment
- infrastructure
- transport

The DEM would define long-term objectives in infrastructure, equipment and transport. Its first task would be the setting-up of the national policy for engineering and maintenance and developing such aspects as:

- strategic planning;
- supervision and control of operations;
- elaboration of texts on safety procedures (electric, fire, biological, etc);
- approval of medical materials,
- development of standards with regard to profiles of infrastructure, equipment, etc.

Collectively, the DEM will focus on planning, funding, managing, monitoring and evaluating the maintenance system. The equipment arm will be involved in all activities related to equipment procurement including design of technical specifications, technical analysis of bids, and commissioning and installation.

Operational level

The operational configuration of the NSE&M is designed in line with the decentralisation initiative and comprises three types of workshops depending on type of health facility served.

FUNCTION

An effective technical and technological information throughput is fundamental for reducing delays and improving system management. At present, this is practically non-existent. Procedures are not clearly defined and, consequently, periods between breakdowns and technician intervention are protracted. In addition to intervention procedures, the recording of such interventions and organisation of preventive maintenance tours are required.

A list of tools will be defined by category of workshop so that all workshops of the same level are similarly equipped. Also, design and implementation of a technical information management system will be required and should be commissioned as soon as possible.

A comprehensive inventory of the equipment, furniture and buildings of all health facilities in the country should be conducted. This is an essential precondition for operationalisation of the system. It will enhance accountability, and proper handling and management of DoSH property.

6.4.2.2 Strategy 2: Organise the process of planning, design, programming and construction/ rehabilitation of the health infrastructures

At the moment, specialists in the design of health structures do not exist in The Gambia. To avoid dysfunctional outputs such as badly sized buildings, lack of global coherence, non-consideration of equipment characteristics, etc., it is important that the implementation sequence for health infrastructure and equipment is followed rigorously.

Engineering and architectural outputs tend to be standardised, and donors generally base interventions on existing standards.

Recommendations

- Creation of a "Spatial Programme Committee" within the DEM charged with programming of t of health facilities construction and rehabilitation.

6.4.2.3 Strategy 3: Plan and implement equipment management procedures

The following actions are required for improvement of equipment availability:

- Strategic planning

The health equipment must be consistent with the Minimum Package of Activities. Consequently, strategic planning for equipment should be finalised after definition of the MPA and be coherent with the national health policy. **The equipment profile in terms of quantity, technological level, etc., must always derive from the MPA.**

- Procurement

The procurement of equipment, whatever the modality (purchase, loan, grant, donation), must correspond to a real need. Environmental factors (skills of users, availability of consumables, etc.,) should be taken into account. Conditions of (supply) contract should be comprehensive and include clauses on training of users and maintenance technicians, spare parts, adaptation to local conditions, etc.

- Commissioning

A team comprising a biomedical and hospital technician must commission all equipment. This activity is of essence as numerous problems can be revealed in the process. Several checks must be made at this point including:

-physical state of delivery;
-correlation between delivered material and order form;
-technical and performance controls;
-availability of technical operation and maintenance manuals;
-complete electrical safety tests; etc.

- Installation

The presence of the technician is necessary during installation procedures for important checks on technical environment (electricity, plumbing, civil engineering, congestion, air conditioning, other fluids, etc.).

- Training of users

More than 60% of breakdowns result from poor use of equipment. In other countries in the region, complete sets of equipment remain in original packaging due to the lack adequate of user training.
Training is a priority area which must be effected in the short-term especially for laboratory technicians, radiology and sterilisation staff, etc.

◆ Preventive maintenance

At present, no preventive maintenance is carried out in hospitals. Reasons cited include lack of trained technicians, unclear procedures, lack of necessary consumables, etc.

A manual of basic standards and procedures for preventive maintenance of biomedical equipment should be prepared in the short run.

◆ Curative maintenance

This presupposes the availability of necessary resources (skilled technicians, adapted equipment, spare parts, technical documentation, etc.) on the one hand and a rigorous organisation (inventory of the material, well-established procedures, etc.) on the other.

◆ Management of inventory and follow-up interventions

To realise this action, a CAMM system (Computer-aided Maintenance Management) should be set-up. This should be based at the central level to allow DoSH monitoring of building, vehicle and biomedical equipment status in real-time.

6.4.2.4 Strategy 4: Make staff at the level of health facilities more sensitive

Health workers are insufficiently prepared at present for managing certain aspects of assets maintenance and it is necessary to sensitive them to that need. The requirement is not for detailed technical training but, rather, preparation for more effective management of assets, sensitisation to the importance of organised maintenance in respective institutions, and familiarisation with the engineering and maintenance system with regard to structure, procedures, resources, and so forth.

In view of the cost recovery possibilities extended to hospitals (and other health facilities), it is essential that personnel are motivated to handle some of the expenses connected to maintenance. Maintenance awareness sessions could be organised by division and should involve key staff of hospitals, MaHCs and DHTs.

6.4.2.5 Strategy 5: Design and Operationalise a Technical Human Resources Development Programme

This strategy is a priority for system development. It aims to improve the technical capacity of staff by organising training courses with technical staff, administrative personnel and users. Upgrading and refresher courses in various fields of maintenance (equipment, buildings and vehicles) will be made accessible to staff to encourage career development and to ensure that staff is informed on state of the art developments in technologies and procedures.

In-services training will be an important component of human resources development and provided on a continuous basis. This will ensure that technicians are provided with latest skills and technology in health maintenance. The following activities will are anticipated:

- Training of polyvalent technicians:

  The objective of this course is to train polyvalent technicians to conduct maintenance interventions (to the 3rdlevel) for the majority of equipment. After training, these technicians will be based either with DHTs or in hospitals.

  The process of selection and recruitment of students should be rigorous: advertisements for the best candidates should be placed in the local press and candidates should relevant assessment tests such electronics, English, motivation, etc.

  The course will have of 1-year duration. It will comprise the following modules:

  <u>First part (general modules):</u>
  Notions of human anatomy and physiology

Basic electricity and electric principals
Workshop technology
Maintenance organisation and implementation
Computer application
English

Second part (specialised modules):
Medical imaging (radiology, ultrasound, film processing machines)
Laboratory
Medical electronics
Refrigeration, air conditioning, etc.
Generators.

The programme will be set up on the basis of a partnership between the proposed Department of Hospital Engineering of the Royal Victoria Hospital, the GTTI and the Department of Hospital Engineering of MRC.

Estimates needs in biomedical technicians are as follows:

Table 2 : Technician Requirements

Type of maintenance workshop	Location	Needs for first year	Needs for second year
Central	Kanifing	2	2
Hospital	RVH	1	1
Hospital	Bansang	1	1
Hospital	Farafenni	1	1
Divisional	Brikama	1	1
Divisional	Soma	1	1
Divisional	Kerewan	1	1
Divisional	Basse	1	1
Divisional	Bansang	1	1
	Total:	10	10

The relatively high number of technicians required is due to the absence of any private capacity and the current low quantity compared to volume of equipment to be procured. However, it is likely that some trained technicians will opt for the private sector leading to more balanced distribution of in-house versus out-contracted maintenance activities.

It will be important for DoSH to guarantee employment of trained technicians prior to launching of the Course.

- Training of specialised technicians

  Specialised technicians in the Kanifing central workshop and the RVH Department of Hospital Engineering will be in charge of 4th level maintenance of hospital equipment. They will have to participate in regular retraining courses either in The Gambia or abroad, especially on those subjects on which there are noticeable inadequacies. Contacted equipment suppliers should organise sessions of this nature also. Specialised training for senior management should be considered.

- The training of users

  As iterated earlier, a considerable proportion equipment breakdown derives from improper use. Thus, training of users is an important axis of engineering and maintenance policy.

  Appropriateness of use will be taken up during training of laboratory, radiology, ultrasound, and other personnel. Courses will be organised within the framework of the maintenance policy and will focus, essentially, on proper use and preventive maintenance.

  A first course for operation of autoclaves should be organised as soon as possible.

6.4.2.6 Strategy 6: Plan progressive transfer of infrastructure and equipment management from Centre to Hospitals and DHTs

The investments programmed for the next few years require adequate maintenance budget. In this sense, the DSS should assign budgets to DHTS and Hospitals for the execution of preventive and curative maintenance, and this should be strictly separated from operating costs. The following ratios are proposed:

- **Infrastructures: 2% of the real estate value;**
- **Equipment: 4 to 5 % of assets value.**

Costs of facilities and equipment provision are to be met with WB-IDA support, except for hospitals. Funding projections will be included in subsequent PER exercises. In addition, management of the budget is to be decentralised to the Divisions, with built-in mechanisms for financial accountability. In view of the gradual introduction of hospital management autonomy that is anticipated, these maintenance costs ratios will be the minimum required to guarantee optimal useful life of facilities and equipment.

6.4.2.7 Strategy 7: Define legal framework for equipment maintenance

Two important aspects with regard to technical and legal obligations will be analysed:

- the obligation to perform maintenance activities;
- the responsibility of the facility in the event of an accident due to neglect of equipment maintenance obligations.

Besides normal entitlement to quality care in a health facility, patients are also entitled to effective protection against such risks as may result from lack of or poor equipment maintenance. Therefore, maintenance of installations and sophisticated equipment is an essential obligation that facilities have to face up to in spite of unfavourable economic conditions.

The objective of this strategy will be to determine responsibilities for equipment failures that pose a threat to the lives of patients, staff, and visitors.

6.4.2.8 Strategy 8: Develop technical standards for engineering and maintenance activities in the health sector

The purpose of this strategy is to develop standards and technical procedures aimed at promoting safety in use and proper maintenance of infrastructure and equipment. It will be geared to disseminating and respecting applicable international safety standards such as radio-protection and use of some categories of equipment.

6.4.3 Implementation

In line with the decentralisation policy, maintenance workshops will be located close to DHTs. In view also of the long term privatisation objective, facilities should be designed such that break-up into various components by discipline is possible when and if private capacity materialises at the divisional level. More immediately, it is essential that all maintenance activities (infrastructure, equipment and transport) share the same location.

6.4.3.1 Equipment maintenance workshops

The various categories of workshops and geographic location are presented in the following table.

Table X: Workshop categories

Type of maintenance workshop	Location	Facilities covered	Services offered[5]
Central	Kanifing	All national public health facilities for high level maintenance and Serrekunda Hospital for 3rd level maintenance	Specialised (4th level) and 3rd level only.
Hospital	RVH	RVH	General and specialised (up to 4th level), consistent with the technological level of hospital.
Hospital	Bansang	Bansang Hospital	Up to 3rd level.
Hospital	Farafenni	Farafenni Hospital	Up to 3rd level.
Divisional	Brikama	All divisional public facilities (Western Division)	Up to 3rd level.
Divisional	Soma	All divisional public facilities (Lower River Division)	Up to 3rd level.
Divisional	Kerewan	All divisional public facilities (North Bank Division)	Up to 3rd level.
Divisional	Basse	All divisional public facilities (Upper River Division)	Up to 3rd level
Divisional	Bansang	All divisional public facilities (Central River Division)	Up to 3rd level

Central Equipment Maintenance Workshop

This will be located in Kanifing and conduct specialised interventions at level 4. It will comprise 4 specialist workshops, a training department, a technical information department and a spare parts store. The 4 workshops are:

- Imaging workshop for maintenance of all radiological and ultrasound equipment;
- Laboratory workshop for all laboratory equipment maintenance;
- Medical electronics for electronic biomedical equipment;
- Hospital equipment, for technical devices (sterilisation, generators, medical fluids, cold chain equipment, etc.).

The Central Workshop will provide technical and supervisory support to all hospital and Divisional workshops. The Technical Information Department will be in charge of operation and maintenance technical documentation as well as documentation on biomedical technology. This department will retain at least 1 copy of user's manuals and maintenance documents for every equipment in all health facilities nationwide.

The Spare Parts Central store will ensure proper stock management and will centralise orders for various workshops.

[5] The list of activities foreseen for every level of maintenance is in appendix.

Hospital level These will comprise hospital maintenance workshops that perform level 3 interventions: generalist technicians performing maintenance activities on biomedical and hospital equipment. The calibre and training of the technicians should allow resolution of the majority of break-downs. Referrals to the central workshop will be sanctioned only when their level of competence is exceeded. Considering the technological level of hospitals, technicians should be re-trained constantly in new technologies and be involved in strategic planning and installation of equipment.

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Divisional level

According to DoSH norms and standards, the Divisional Technical Team will be based in divisional capitals and always near the Divisional Health Team. They will conduct technical interventions of the level 1 to 3 variety, in such domains as medical equipment, cold chain equipment, and so forth. The DTT will be strengthened to cover all public health facilities in their respective divisions and will have regular supervision from Central Workshop. DTTs will inspect equipment in the division frequently, in order to reinstate equipment which are in good condition but non-functional (which are quite numerous) and to prevent breakdowns through preventive maintenance and training of users.

In order for the NSE&M to have resources sufficient for execution, the central workshop and possibly the divisional workshops must be granted some degree of autonomy. This possibility should be reviewed by workshop staff, by DoSH authorities, and by personnel in those structures that are already autonomous (hospitals).

6.4.3.2 Estate and infrastructure maintenance workshops

Level 5

Not applicable

Level 4

In the Banjul area (Kanifing) and at hospitals a specialist maintenance team is to be installed if one is not yet in place.

The following distribution is proposed:

Type of maintenance workshop	Location	Facilities covered
Central	Kanifing	All national public health facilities of primary and secondary level
Hospital	RVH	RVH
Hospital	Bansang	Bansang Hospital

Hospital	Farafenni	Farafenni Hospital

Personnel requirements

Staff complement is estimated at 31 for the RVH and Central Unit, and 20 for local hospitals, comprising:

- Maintenance manager/ hospital engineer
- Planner supervisor
- Electrical maintenance engineer
- Mechanical maintenance engineer
- Building maintenance engineer
- Electrical tradesmen (2-3)
- Mechanical tradesmen (3-5)
- Building tradesmen (3-5)
- Painters (1-2)
- Storekeeper
- labourers (5-10)

Facilities would consist of:

- Office space for 8 – 80 m2
- Electrical workshop – 30 m2
- Mechanical workshop – 30 m2
- Building workshop – 30 m2
- Painting workshop – 30 m2
- Equipment store – 50 m2
- Material store – partitioned – 50 m2
- Service yard – 200 m2
- Pick-up
- Truck.

Level 3

A division-based, hands-on maintenance team is to be installed as part of the Divisional Health Team. Distribution over the country is proposed as follows:

Base	**Coverage**
Brikama	Western Division
Kerewan	North Bank Division
Bansang	Central River Division
Soma	Lower River Division
Basse	Upper River Division

Personnel would consist of:

- 2 No. maintenance staff at inception – to be reviewed after 12 months;
- Support staff is shared with the DHT or hospital;

Facilities would consist of:

- general workshop - 30 m2
- stores – 30 m2
- 1 No. pick-up truck
- ancillary rooms (tea room, toilets, etc.) is shared with the DHT or hospital

Level 2

Executed by labourers of facility and by community volunteers at the primary level.

Level 1

Does not require professional attention

6.4.3.3 Vehicle maintenance workshops

Covered in ensuing section.

6.5 VEHICLE MAINTENANCE

6.5.1 Maintenance Components

The normal components of a vehicle maintenance cost system are:

- Spare parts and consumables
- Labour
- Overheads (equipment, management, insurance, etc.)
- Services (machining, painting, and others)

There is no vehicle costing system in place: spares personnel and equipment inputs are all provided from budget. Records of spare parts used are kept, but there is no systematic computation of labour and overhead costs of repairs or services.

The maintenance budget for year 1999 is about D750,000, including con-sumables for vehicles and generators. This is far from adequate. Based on standard maintenance costs of 5% of total investment value, for a fleet of about 103 four-wheeled vehicles costing an average of D300, 000 each and 175 motor cycles costing an average of D25, 000 each, the maintenance budget works out at the abut D2.0 million.

6.5.2 Private sector maintenance capacity

6.5.2.1 Existing situation

A survey form was designed and distributed to selected private sector workshops in the urban and rural areas (see list of people met in annexes). Visits to facilities in satellite stations and private garages in Basse, Bansang and Soma were also conducted for assessment of:

- Facilities and equipment;
- Scope of services;
- Personnel;
- Stock of spare parts;
- Experience with institutional customers;
- Labour and Spare Parts Cost.

Based on the survey and visits, the following conclusions are drawn:

- There is ample capacity in the private sector in the urban area: some of the workshops surveyed rank higher than the transport workshop in Kanifing.

- There is limited private sector capacity in the regions: main limitations are repair facilities, tools and equipment, and no organised or standard system of pricing works;
- The labour rates in private garages range from D6 per hour (Corr Enterprises) to D50 per hour (Breckwoldt): less formal set-ups do not have an organised system of pricing; use of standard times for repairs is not common;
- Garages expect a mark-up of about 25% on spare parts and materials.

6.5.2.2 Comparison of Private and Public Sector maintenance regimes

Based on the 1999 budget, the following breakdown can be extracted:

Maintenance (spare parts, consumables for transport unit)	D750000
Salary	D262562
Allowances	D 63329
Total	D1,075,892

Apportioning this amount between four wheeled vehicles, motor cycles and generators is problematic. Total allocation to four-wheeled vehicles translates to cost per vehicle per year of about D10, 000, labour and spares inclusive. This is too small. A more realistic figure of 5% of investment value for spare parts alone should be about D15,000.

It is difficult to make quantitative comparisons with the private sector because:

- The private sector views labour and overheads as important elements of their pricing mechanism while the public sector treats this input as free (supplied by government). There is therefore no vehicle costing system in the transport unit of the DOSHSWA that incorporates or even records labour and overheads.;
- The maintenance budget is unrealistically low and insufficient for optimal maintenance. Use of this figure will give a false sense of public sector cost efficiency;
- A good part of the spare parts requirements is met through cannibalised vehicles;
- Maintenance budget is used for vehicles, generators and other technical equipment.

Despite the above difficulties, the following can be observed of the private sector:

- Efficiency in resource utilisation (labour, utilities, transport, fuel and other overheads);
- Flexibility and responsiveness (absence of bureaucracy) in procurement of inputs and market exploitation. However, these efficiencies are not automatically passed on to the customer especially if the customer is a government institution.
- Limited investment requirements from government resources because it is assumed that interested garages would have already built necessary capacity or would make the necessary investments. This advantage is somewhat reduced, as workshops will attempt to recover this from repair bills in very short periods.
- More compatible with government policy of decentralisation and capacity building. However, these trend will be more attractive if other branches of government are also decentralised thus expanding volume of operations and thus encourage investors to set-up in the regions.

Arguably, some of the drawbacks of an out-contracted maintenance arrangement can be eliminated by competition, but, for now, the transport maintenance industry does not have the characteristics of pure competition[6].

The drawbacks of the private sector are:

[6] Such a minimal entry barriers, no product differentiation, and large number of buyers and sellers

- Relatively low level of sensitivity for the special nature of ambulance services (life and death). Other customers may compete for attention of repair personnel.
- Service delivery is based on payment: no pay no service or services priced high to hedge against slow payments and the related financing costs.

There is an interesting proposal submitted to the DoSH&W from Riders for Health (RfH) for management of maintenance and operation of vehicles aimed at zero breakdowns. The basic requirement, of course, is provision of adequate resources to carry out preventive maintenance in accordance with the manufacturers' recommendations. Another requirement is a healthy fleet of vehicles without existing major problems. Cost of service is to be based on a pre-determined cost per kilometre ration that allows for all operational and maintenance costs. The DoSH to assess the sustainability of this rate on the basis of total operated kilometres.

Potentially, this may be an attractive and encouraging channel for donors who are concerned with maintenance and operation of aid vehicles.

6.5.3 Information Management

For an effective transport service, an information management system is required leading to informed decision making. This will serve as a tool for improving availability and reliability of vehicles in support of health delivery services.

Currently, a basic information system exists whose main components are:

- Record of vehicles, age, location and condition;
- Record of spare and consumables used in repairs and maintenance.

It is recommended that the following be incorporated in the system:

- Labour and overhead costs
- Analysis of breakdowns to determine the types and the resulting down times
- All information to be based on the kilometre operated (odometer reading) as it is the main cost driver
- All fuel, lubricants, spare parts and consumables costs to be computed as ratios of km operated. This will help in future budget preparation
- Further more, it is important that the system emphasises the use of information in measuring and improving transport services.
- Towards this objective, the following indicators are important:
  - Kilometres travelled
  - Kilometres travelled per litre of fuel
  - Maintenance cost per year
  - Maintenance cost per kilometre
  - Vehicle availability and utilisation

6.5.4 Recommendations and Proposals

6.5.4.1 Strategic recommendations

It is recommended that in the short term maintenance be done under the public sector regime as proposed in the Health Sector Requirement Studies. This is because of the performance potential of the maintenance unit and also because of the management and control problems associated with outsourcing.

In the long term, private outsourcing is an option but the following conditions are necessary:

- Introduction of a vehicle costing system reflecting the true picture of maintenance and repair costs;
- Introduction of a good management information culture permeating the levels of the transport unit and senior management of the health delivery system;
- Strengthening the management and monitoring capabilities of the present transport management.

Important elements of that process will be:

- Contract negotiation and administration;
- Costing and cost control;
- Performance evaluation based on the indicators of down time, no of unscheduled breakdowns as a ratio of kilometres operated and maintenance cost per km. In the absence of these conditions, outsourcing could become chaotic and difficult to manage.

The objective of any maintenance system must, among other things, include:

- ensure maximum availability and reliability of vehicles;
- ensure that the life span of the vehicle is prolonged; and
- ensure that all of this is done in a cost-effective manner.

Proposals and recommendations are given below.

6.5.4.2 The organisation

The present organisation of the maintenance unit in Kanifing Bansang and Mansakonko can be further decentralised and strengthened along the following lines:

Level 1 (to be done by driver) will include:

Checking fluid levels (oil, water and brake fluid) and correcting
Checking of tyre pressure
Checking that brakes, lights, and indicators are working
Starting engine and listening to unusual noise
Tools required: Tyre pressure tester

Level 2 (to be carried out by mechanic at divisional level)

Level 1and the following:
Greasing
Oil Change
Tightening of bolts and screws
Change of tyres, light bulbs and fuses.
Tools required: Tool box plus tyre pressure tester

Level 3 (to be carried out by team at Mansakonko and Bansang)

Level 1 + level 2 and the following:
Minor repairs

Major repairs
Tools required Tool boxes, battery charger, air compressor, trolley jacks, hand grinding and drilling machines, metal working tools like files, chisels and hammers.

Level 4 (to be done at Kanifing)

Levels 1-3 and the following:
Overhauling of engines and transmissions
Reconditioning of fuel pumps (out contracted at present)
Panel beating (out contracted at present)
Tyre repairs
Break down rescue operation (mobile unit)
Tools required (see section 5.3.3.3, facilities)

It is proposed that the Divisional Health Team include mechanics competent to carry out level 2 maintenance. With a little training the same person(s) could do basic equipment and building maintenance.

6.5.4.3 Scheduling

The present mixed system based on a combination of time and kilometre operated maintenance scheduling should be maintained. However, it is important to remember that the kilometre is a more appropriate determinant of usage and forms the major cost element. Records should always reflect the odometer reading.

It is important to monitor compliance with maintenance schedules

6.5.4.4 Facilities

The facilities need to be improved. The following recommendations are made:

- Decongest the yard in Kanifing by removing scrapped vehicles
- Construct or extend present workshop to provide for additional work bays with dedicated facilities for tyre repairs, welding and electrical repairs.
- Construct stores facilities and free the service pit for maintenance operations and construct an additional service pit with capacity to handle truck servicing. Pits should be equipped with inspection and oil filling and greasing facilities
- Repair compressed air system and provide adequate outlets
- Extend working shed in Mansakonko and rehabilitate existing structure and provide addition tools.
- Provide security fencing around workshop area in Bansang and provide additional tools

6.5.4.5 The Budget

One of the problems is the low level of provision. The amount budgeted for the 1999 year is D750,000 which represents total amount for spare parts and consumables for four-wheeled vehicles, motor bicycles and generators. As demonstrated in section 6.5.1, this is far below the requirements. Another way of looking at the problem is to identify those spare parts that are likely to be replaced during the course of the year and to work

out their costs. This will form a stronger argument for increased (more realistic) budget provisions. A budget target of about D2, 000,000 appears realistic.

6.5.4.6 Man power

For an operation the size of the transport unit, (103 four wheeled vehicles and 175 motor cycles), there is the need for a staff recruitment, and development and management planning.

6.5.4.6.1 Recruitment

The target should be to gradually build up a core of literate mechanics and drivers. Mechanics should be GTTI or equivalent level graduates.

6.5.4.6.2 Training

Training should include the following:

- Skills development to produce multi-skilled mechanics
- Reinforcement of a new maintenance culture.
- Improvement of literacy and numeracy levels
- System diagnostics and repair methods

There should also be a succession plan that should start preparing some young technicians or engineers to take over from the present transport manager, as he will reach retirement in the next few years.

6.5.4.6.3 Motivation

The government system has rather limited possibilities for rapid growth. This has made retention of qualified people very difficult. Such people have been recently lost to MRC and other workshops. It is recommended that efforts be made to improve the salary levels of maintenance staff. The recommendation to improve the work facilities and to provide more tools and protective clothing will go a long way to enhance staff motivation.

6.6 COSTS

In order for the NPE&M to be organised in an optimal way, it is necessary that a budget be assembled for initial investments as well as for operational expenses.

6.6.1 Inception cost

The broad set of investment inputs summarised in table 3 is essential to strengthen the national maintenance system:

Table 3 : Necessary investments for maintenance strengthening

	Year 1	Year 2	Year 3	Year 4	Total (in U$)
International TA	115,500	115,500	0	0	231,000

Workshops (buildings)	45,000	45,000	0	0	90,000
Workshops (furniture, equipment and tools)	60,000	60,000	0	0	120,000
Transport	50,000	0	0	0	50,000
Training (overseas)	22,000	0	0	0	22,000
Training (national)	20,000	20,000	0	0	40,000
Initial lot of spare parts	50,000	50,000	0	0	100,000
Documentation	5,000	0	5,000	0	10,000
				Total:	**663,000**

Technical assistance: to be provided to strengthen the maintenance management capabilities and to set up the national maintenance system;
The budget for buildings includes extension of the building under construction in Kanifing and the construction of Divisional Maintenance Workshops;
Test equipment and tools: Under this rubric, 1 lot of specialised test equipment for the central workshop, 5 lots of specialised tools (3 for the and central workshop and 2 for the RVH), 11 lots of general-purpose test equipment (1 for each workshop) and 22 lots of general-purpose tools (1 for each technician, except RVH) are anticipated;
Transport: This budget anticipates a vehicle for the central workshop and one motorcycle divisional workshop
Overseas training to strengthen local maintenance management capacity (strategic planning and operational management);
Local training will provide 24 engineers (12 per year during two years);
An initial lot of spare parts to allow the workshops to repair equipment which are out of order at present;
A budget for technical documentation.

6.6.2 Civil Works Maintenance Costs

Annex E in volume 2 of this report details costs of building maintenance beginning with the existing situation through year 10 and beyond. $700,000 is required for immediate works. Thereafter, the annual costs rise to a total of $1.2 million in year 10, and $1.4 million from year 11 onwards.

A breakdown of immediate maintenance costs by category of facility i.e. dispensary, minor and major health centres is provided for existing facilities. Costs in subsequent years factor in new facilities and/or rehabilitating of existing as these are commissioned, and allow for the maintenance requirements these impose.

6.6.3 Vehicle Maintenance Costs

An estimate of the requirements and costs for vehicle maintenance is given below.

List of requirements

Equipment and Facilities Requirements
1. Facilities

Item	Cost(US$)
Provision of adequate draining system and septic tank	10000
New Relocated Wash Bay	10000
Re-elevation and upgrading of service pit	5000
Renovation of store and workshop office	10000
Erection of warehouse for storage of spare parts	30000
Transport manager's office	10000
Erection of motorcycle repair workshop	10000
Construction of additional working bay	4000
Erection of security office	2000

Erection of fence around compound and gate			5000
Plumbing for compressed air system			500
Sub total facilities			96500

2. Equipment and tool requirement

Item	Quantity	Unit Price	Total
Complete Tool Box, mechanical	20	200	4000
Complete Tool Box, electrical	2	150	300
set of extractors (small, medium and big)	5	100	500
Set of stud extractors	5	100	500
Set of Micrometers, external	5	150	750
Set of Micrometers, internal	5	150	750
Set of Chisels	10	100	1000
set of Punches	10	50	500
Torque Wrench	5	100	500
Set of Allen keys	10	20	200
set of combination spanners	10	100	1000
set of sockets	10	100	1000
injector sockets	5	50	250
Set of Mallet Hammers	5	50	250
Set of sledge hammers	5	100	500
Set of socket wrenches	5	50	250
set of pipe wrenches	5	100	500
Set of grip pliers	5	80	400
Set of pliers, nose pin circlip	10	20	200
Set of gauges (mm)	5	80	400
Set of screw drivers Stanley	20	50	1000
Set of screw drivers Philips	20	50	1000
Hydrometer	5	10	50
High rate discharge tester	5	50	250
Universal electrical (tester) avometer	10	50	500
Set of soldering iron, small medium, big	5	20	100
Electrical hand drilling machine with drill bits (small)	5	100	500
Electrical hand drilling machine with drill bits (big)	5	200	1000
			0
Bench Grinding Machine	3	100	300
Bench drilling Machine	3	200	600
Bench Vice medium	3	100	300
Bench Vice small	3	50	150
			0
Trolley jack 5 ton	5	200	1000
Trolley jack 10 ton	5	300	1500
Hydraulic press	2	400	800
Electrical welding apparatus	2	1000	2000
Sub total tools and equipment			24800
TOTAL TOOLS, EQUIPMENT AND FACILITIES			121300

Based on the present system of maintenance and on existing experience both in the transport unit and within the operating environments (roads, dust, and temperature), the following are likely to be changed per vehicle per year:

Parts likely to be changed in a year

Description	Quantity	Unit Cost(D)	Total (D)
Oil Filter	4	150	600
Engine Oil (Liters)	44	30	1320

Fuel filter	2	350	700
Set Fan Belt	1	200	200
Set Brake Lining	1	750	750
Set Brake Pad	1	750	750
Tires (Outer, Tube and Flap)	4	1875	7500
Batteries	1	750	750
Air Filter	1	450	450
Prop-Shaft Universal Joint	1	650	650
King Pin Bearing	4	350	1400
Head Light Bulbs	2	55	110
Clutch Disc	1	750	750
TOTAL			**15930**
TOTAL FOR 103 Vehicles			**1,640,790**

6.6.4 Equipment maintenance cost

Recurrent expenses

To estimate the recurrent expenses for adequate maintenance, an average of 4% of the purchase value of equipment was retained. This ratio is in line with the IDA – GOTG agreement as well as with ratios recommended for West Africa countries. It doesn't include personnel expenses.

Maintenance cost per category of health facility

Health Facility	Estimated equipment value (in U$)
Minor Health Centres	10 500
Major Health Centres	262. 769
Bwiam Hospital	1 000 000
Serrakunda Hospital	1 000 000
Farafeni Hospital	1 500 000
Bansang Hospital	325 000
Royal Victoria Hospital	2 150 000

The equipment value of MaHCs and MiHCs was estimated according to the standard list proposed by the Team.

- Bwiam and Serrekunda hospitals equipment value was estimated. As the profile of the offer is supposed to be the same in both hospitals, the estimated equipment value is similar;
- Bansang and RVH equipment value was estimated by DoSH – WHO (in Cost Analysis of the Health Sector in The Gambia);
- Farafenni Hospital equipment value was estimated by IDA mission of October 1997.

As the number of hospitals and MaHCs will remain constant (3 hospitals and 7 MaHCs), the increases to maintenance costs will be a function of the number of MiHCs built.

7 Synthesis

7.1 HEALTH PYRAMID AND MPA

The structural configuration of the health pyramid must be reviewed, and a revised MPA that mirrors the reconfigured pyramid assembled. Additionally, the services delivered at different levels of the pyramid must be better differentiated.

Organisation of the health system at the primary level is effective, and should be reinforced. In particular, the number of PHC villages must be increased to reflect population growth in each settlement and district of the country. Location of trekking stations must be carefully thought out to ensure that MCH activities are that much closer to the population.

Organisation of health services at the level secondary should be restructured for greater effectiveness than currently pertains. This is the single most important action required for substantive improvement of the health services in The Gambia requiring simplification of structures and the improvement of the referral system between them. A network of MiHCs, linked to fully functional MaHCS, should be effected. The implantation of this system should be stretched over a period of 10 years, and should include facilities rehabilitation, upgrading and new construction works.

The tertiary level must develop its own specialised cluster of referral services so that it does not compete with lower levels of care. Resources dedicated for that purpose should not detract from primary and secondary levels of care.

The number of MiHCs required by division has been evaluated over a 10-year period. The total number of hospital beds necessary to cover the anticipated population has been calculated also. The distribution of these beds, by division and by level of structure, for every facility has been proposed.

Implementation of a system of reliable health information should be achieved quickly. This system will permit analysis of the functionality of every existing structure. It will be an important decision making tool for specifying exact location for the new MiHCS. With data provided by this health information system, a comprehensive health map should be created. This will allow monitoring of the evolution of the health system, and incremental adaptation of facilities location according to real needs. The software prepared during the present mission represents the a step in the development of more sophisticated software.

Western Division, in particular the BMC-KMC area, should be analysed by a comprehensive in-depth survey before commissioning new public facilities. An exhaustive examination of services currently provided by the private sector, analysis of possible public / private partnerships, and willingness to pay for services by the resident population are key areas for coverage by the survey.

Construction of MiHCs and MaHCs could be approached in either of two ways:

On a division by division basis: secondary level of a division completely reorganised before passing to the following division. In this approach, it would be necessary to start with the most underprivileged divisions, i.e. URD;

On the basis of levels: all MiHCS required for the period of 10 years would be rehabilitated or built nationwide, prior to rehabilitating and building of MaHCS.

From a functional point of view, the first option is preferable. Operationalising the MiHC level without the referral back-up of MaHCs may destroy the credibility of MiHCs. However, from the equity and politics perspective, the second option may be more feasible.

It is urgent for the DSH to improve the co-ordination between different donors, to strengthen the planning capacity of the DSH, and to circulate health mapping proposals to all donors. Such co-ordination could be carried out and supported by the WHO local office.

7.2 CIVIL WORKS AND INFRASTRUCTURE

Infrastructures and equipment play a fundamental role in improving the quality of health care. Procedures for accreditation of health facilities in other countries increasingly depend on the capacity of management teams to properly administer their assets toward improving health care systems.

Strategies here proposed aim to improve the management of the health facility assets in The Gambia with the objective of enhancing operational availability of equipment and infrastructure in a way that is coherent with the purpose they are supposed to fulfil. The ultimate goal is to contribute to global improvement of quality of care in health facilities and to contribute to the improvement of patients' health at minimum cost to the community.

7.3 EQUIPMENT

As Underlined in the HSRS, inadequate quality and quantity of equipment plus a conspicuous absence of proper planning has rendered peripheral health structures incapable of performing assigned functions. To counter this situation, government has undertaken the upgrading of health equipment ass a means of strengthening quality of care and improving motivation of staff.

Standardised equipment lists and routine procedures for maintenance and replacement are critical tools in that regard. The lists here proposed are designed to support the health priorities defined in the minimum and complementary packages of activities. The equipment profile is also based on morbidity and mortality structure.

The budget for replacement is premised on an assumption that all existing equipments require replacement.

7.4 VEHICLES and TRANSPORT

Transport and vehicles are utilised by various categories of facilities including hospitals, MaHCs and MiHCs, DHTs as well as such units as Medical Headquarters, Department of State for Health, Schools and maintenance departments. However, this study has focused on the direct requirements for health services delivery. Such vehicles serve a variety of purposes including evacuation, MCH trekking, supervision of primary health activities, drug supply, and staff welfare.

The current transport fleet comprises of four-wheeled vehicles (ambulances, utility and others) and motorcycles a considerable proportion of which is in poor condition. A key problem lies in insufficient budgetary provision leading to shortages of spares and consumables. Tools, equipment and maintenance facilities are also inadequate. The workforce is inadequate and insufficiently trained, and bureaucratised decision-making cause delays in procurement which translate to shortages in critical inputs.

The private sector has sufficient capacity for maintenance of vehicles in the urban area while capacity is more limited in rural areas. While direct comparison between private and public sector performance is difficult, the private sector is generally more efficient in resource utilisation. To ensure that maintenance activities benefit from perceived efficiencies of the private sector, a significant degree of restructuring is required before the option of out-contracting can be fully explored. Such privatisation can only be a viable option if decentralisation and capacity building at the regional level are widely embraced by other government departments.

7.5 MAINTENANCE

Maintenance of equipment and infrastructure has generally been accorded low priority in the health services sector with limited resources provided maintenance and replacement of equipment and infrastructure.

The objective of the National Health Policy for Engineering and Maintenance (NHPfEM) is to ensure permanent protection of investments made in terms of infrastructure, vehicles and equipment by better economy planning of purchases, works (new construction and rehabilitation), and maintenance.

Proper management of health assets should be approached at the national level with the establishment of a NHPfEM which would define technical standards, set the criteria for choice of equipment, the functional organisation maintenance workshops, and other norms and standards.

A cornerstone of this approach is the progressive transfer of infrastructures and equipment management from the centre to hospitals and divisional health teams.

8 Annexes

8.1 Annex A - 1:

POPULATION PROJECTIONS

DISCODE	DISTRICT	REGCODE	1983 Pop	1993 pop	Log (P_o/P_t)	Rate growth	1999 pop	2009 pop		
01	BANJUL	01	44,188	42,326	-0.019	-0.43%	41,425	39,679	1.8%	
02	KOMBO ST MARY'S	01	101,504	228,214	0.352	8.44%	342,194	769,362	34.5%	
	Total Division		***145,692***	***270,540***	***0.269***	***6.38%***	***383,618***	***809,042***	***36.3%***	
03	KOMBO NORTH	01	33,483	80,478	0.381	9.17%	124,768	299,886	13.4%	
04	KOMBO SOUTH	01	26,270	39,694	0.179	4.21%	48,793	73,726	3.3%	
05	KOMBO CENTRAL	01	29,253	56,094	0.283	6.73%	77,676	148,948	6.7%	
06	KOMBO EAST	01	14,643	21,028	0.157	3.69%	25,199	36,187	1.6%	
07	FONI BREFET	01	6,888	8,529	0.093	2.16%	9,491	11,752	0.5%	
08	FONI BINTANG KARANAI	01	10,787	11,397	0.024	0.55%	11,715	12,377	0.6%	
09	FONI KANSALA	01	7,268	7,748	0.028	0.64%	8,000	8,528	0.4%	
10	FONI BONDALI	01	3,749	4,594	0.088	2.05%	5,085	6,232	0.3%	
11	FONI JARROL	01	4,904	5,355	0.038	0.88%	5,596	6,110	0.3%	**WD**
	Total Division		***137,245***	***234,917***	***0.233***	***5.52%***	***316,323***	***603,747***	***27.1%***	***63.3%***
12	KIANG WEST	04	11,578	13,479	0.066	1.53%	14,544	16,931	0.8%	
13	KIANG CENTRAL	04	6,402	7,287	0.056	1.30%	7,774	8,849	0.4%	
14	KIANG EAST	04	5,668	6,356	0.050	1.15%	6,731	7,548	0.3%	
15	JARRA WEST	04	16,580	20,673	0.096	2.23%	23,084	28,783	1.3%	
16	JARRA CENTRAL	04	5,249	6,084	0.064	1.49%	6,550	7,592	0.3%	
17	JARRA EAST	04	9,786	11,272	0.061	1.42%	12,098	13,935	0.6%	
	Total LR Division		***55,263***	***65,151***	***0.071***	***1.66%***	***70,780***	***83,638***	***3.7%***	
18	LOWER NIUMI	02	23,805	35,147	0.169	3.97%	42,707	63,055	2.8%	
19	UPPER NIUMI	02	15,280	21,552	0.149	3.50%	25,596	36,102	1.6%	
20	JOKADU	02	9,567	14,874	0.192	4.51%	18,546	28,834	1.3%	
	Total NBW Division		***48,652***	***71,573***	***0.168***	***3.94%***	***86,849***	***127,991***	***5.7%***	
21	LOWER BADDIBU	03	11,845	14,391	0.085	1.97%	15,862	19,272	0.9%	
22	CENTRAL BADDIBU	03	11,902	15,060	0.102	2.38%	16,941	21,435	1.0%	

23	UPPER BADDIBU	03	39,820	55,438	0.144	3.36%	65,412	91,068	4.1%	**NBD**
	Total NBE Division		***63,567***	***84,889***	***0.126***	***2.93%***	***98,215***	***131,776***	***5.9%***	***11.6%***
24	LOWER SALOUM	05	12,759	14,179	0.046	1.06%	14,947	16,611	0.7%	
25	UPPER SALOUM	05	10,359	12,552	0.083	1.94%	13,817	16,742	0.8%	
26	NIANI	05	15,734	18,531	0.071	1.65%	20,111	23,686	1.1%	
27	NIANIJA	05	5,095	6,439	0.102	2.37%	7,239	9,148	0.4%	
28	SAMI	05	13,647	16,073	0.071	1.65%	17,443	20,544	0.9%	
29	NIAMINA DANKUNKU	05	4,695	6,089	0.113	2.63%	6,934	8,993	0.4%	
30	NIAMINA WEST	05	5,192	5,948	0.059	1.37%	6,366	7,293	0.3%	
31	NIAMINA EAST	05	12,321	15,402	0.097	2.26%	17,220	21,527	1.0%	
32	FULLADU WEST	05	43,134	57,995	0.129	3.00%	67,247	90,416	4.1%	
33	GEORGETOWN	05	3,068	2,813	-0.038	-0.86%	2,694	2,470	0.1%	
	Total CR Division		***126,004***	***156,021***	***0.093***	***2.16%***	***174,019***	***217,430***	***9.7%***	
34	FULLADU EAST	06	59,075	84,327	0.155	3.62%	100,751	143,817	6.4%	
35	KANTORA	06	17,290	26,502	0.185	4.36%	32,811	50,293	2.3%	
36	WULI	06	22,745	29,541	0.114	2.65%	33,666	43,725	2.0%	
37	SANDU	06	12,278	14,689	0.078	1.81%	16,067	19,222	0.9%	
	Total UR Division		***111,388***	***155,059***	***0.144***	***3.36%***	***183,295***	***257,057***	***11.5%***	
	Total The Gambia		***687,811***	***1,038,150***	***0.179***	***4.20%***	***1,313,099***	***2,230,679***	***100.0%***	

8.2 Annex A – 2:

PROPOSED HEALTH DELIVERY FACILITIES by CATEGORY OF FACILITY and DIVISION								
Type of facilities	**BCC**	**KMC**	**WD**	**LRD**	**NBD**	**CRD**	**URD**	**Total**
1993 Census Population	**42,326**	**228,214**	**234,917**	**65,146**	**156,462**	**156,021**	**155,059**	**1,038,145**
2009 Projected Population	**39,679**	**769,362**	**603,747**	**83,638**	**259,766**	**217,430**	**257,057**	**2,230,679**
Referral Hospital (RH)	None applied		NA					
	RVH				Farafenni	Bansang		**3**
RHC required	**3**		**2**	**1**	**1**	**1**	**1**	**9**
extg. facilities (upgrdng)		Serrekunda	Bwiam	Soma		Kuntaur	Basse	
new facilities			**Brikama**		**Kerewan**			
Total provided RHC	**1***		**2**	**1**	**1**	**1**	**1**	**7**
IHC required	**40**		**30**	**6**	**17**	**14**	**17**	**125**
Existing facilities								
		Fajikunda	Brikama	Mansa Konko	Essau	*Kuntaur*	*Basse*	
Total MHC	1		1	1	1	0	0	4
		Serrekunda	Gunjur	K'Karantaba	Kuntair	Kaur	Fatoto	
		Bakau	Bwiam	Bureng	Kerewan	Kudang	Yorobawol	
Total MiHC	2		2	2	2	2	2	12
	Leman St.		Banjul Nding	Kwinella	Medina Bafuluto	Janjangbureh	Gambisara	
			Sukuta		Ngayen Sanjal	Brikamaba	Diabugu	
			Brufut		Salikenni	Sami Karantaba	Baja Kunda	
						Dankunku		
						Chamen		
Total Disp	1		3	1	3	5	3	16
Total existing facilities	**3**		**6**	**4**	**6**	**7**	**5**	**31**
Total new facilities (1)	**37**		**24**	**2**	**11**	**7**	**12**	**94**
Impact of other criteria (2)	**-20**		**-15**	**0**	**0**	**0**	**0**	**-35**
Net New IHC required	***17***		***9***	***2***	***11***	***7***	***12***	***59***
"(1)"	Required - existing. Based on population criteria.							
"(2)"	Taking account non-public Health sector partners. Half IHC run by private sector in BCC/KMC/WD							

8.3 Annex A – 3:

	ANNEX 3 - BEDS per DIVISION							
Current (Global)		**Public**			**Private**			
DIVISION	**POPULATION**	**Hop**	**MHC**	**Other**	**Hop**	**Other**	**Total**	**Pop/Beds**
Western	690,000	626	107	0	143	79	955	***723***
Lower River	71,000		23	0		20	43	***1,651***
North Bank West	85,000		40	15		55	110	***773***
North Bank East	100,000	108	4	0		20	132	***758***
Central River	175,000	149	22	50			221	***792***
Upper River	185,000		29	37			66	***2,803***
Total	*1,306,000*	883	225	102	143	174	1,527	***855***
Pop/Beds		***1,479***	***5,804***	***12,804***	***9,133***	***7,506***	***855***	
Current (Without BMC & KMC)		**Public**			**Private**			
DIVISION	**POPULATION**	**Hop**	**MHC**	**Other**	**Hop**	**Other**	**Total**	**Pop/Beds**
Western	307,000		57	0		79	136	***2,257***
Lower River	71,000		23	0		20	43	***1,651***
North Bank	185,000	108	44	15		75	242	***764***
Central River	175,000	149	22	50			221	***792***
Upper River	185,000		29	37			66	***2,803***
Total	*923,000*		175	102		174	708	***1,304***
Pop/Beds			***7,463***	***12,804***		***7,506***		
Anticipated	Distribution							
540	Bwian	120						
	Serekunda	120						
	Paediatric BJL	300						
New total (With Bwiam & Serekunda)								
		Public			**Private**			
DIVISION	**POPULATION**	**Hop**	**MHC**	**Other**	**Hop**	**Other**	**Total**	**Pop/Beds**
Western	690,000	626	347	0	143	79	1,195	***577***
Lower River	71,000		23	0		20	43	***1,651***
North Bank	185,000	108	44	15		75	242	***764***
Central River	175,000	149	22	50			221	***792***
Upper River	185,000		29	37			66	***2,803***
Total	*1,306,000*	883	465	102	143	174	1,767	***739***
Pop/Beds		***1,479***	***2,809***	***12,804***	***9,133***	***7,506***	***739***	
New total (With Bwiam, Serekunda, Paediatrics)								
		Public			**Private**			
DIVISION	**POPULATION**	**Hop**	**MHC**	**Other**	**Hop**	**Other**	**Total**	**Pop/Beds**
Western	690,000	926	347	0	143	79	1,495	***462***
Lower River	71,000		23	0		20	43	***1,651***
North Bank	185,000	108	44	15		75	242	***764***
Central River	175,000	149	22	50			221	***792***
Upper River	185,000		29	37			66	***2,803***
Total	*1,306,000*	1183	465	102	143	174	2,067	***632***

Pop/Beds		***1,104***	***2,809***	***12,804***	***9,133***	***7,506***	***632***	
Proposal		**Public**			**Private**			
DIVISION	**POPULATION**	**Hop**	**Bed I**	**Other**	**Hop**	**Other**	**Total**	**Pop/Beds**
Western	1,410,000	685	405		374	79	1,543	***914***
Lower River	83,600		20			20	40	***2,090***
North Bank	260,000	75	101			75	251	***1,036***
Central River	217,000	132	110				242	***897***
Upper River	257,000		154				154	***1,669***
Total	*2,227,600*	892	790		374	174	2,230	***999***
Pop/Beds		***1,464***	***1,653***		***3,492***	***7,506***	***999***	

8.4 Annex A – 4:

CATCHMENT AREAS: BEDS II DISTRIBUTION

d

			District	Division	2009
		RVH	Jokadu	NBD	28,834
			Upper Niumi	NBD	36,102
Growth			Lower Niumi	NBD	63,055
rate:			Banjul	BCC	39,679
URD	3.36		Kanifing	KMC	769,362
CRD	2.16		Kombo North	WD	299,886
LRD	1.66		Kombo South	WD	73,726
NBD	3.5		Kombo Central	WD	148,948
WD	5.52		Kombo East	WD	36,187
BCC	-0.43		Foni Brefet	WD	11,752
KMC	8.44		Foni Bintang-Karenai	WD	12,377
			Foni Kansala	WD	8,528
			Foni Bondali	WD	6,232
			Foni Jarrol	WD	6,110
				Total RVH :	**1,540,779**
		Farafenni	Kiang Central	LRD	8,849
			Kiang East	LRD	7,548
			Kiang West	LRD	16,931
			Jarra West	LRD	28,783
			Jarra Central	LRD	7,592
			Jarra East	LRD	13,935
			Upper Saloum	CRD	16,742
			Lower Saloum	CRD	16,611
			Upper Baddibu	NBD	91,068
			Central Baddibu	NBD	21,435
			Lower Baddibu	NBD	19,272

				Total Farafenni :	**248,766**
		Bansang			
			Sandu	URD	19,222
			Wuli	URD	43,725
			Kantora	URD	50,293
			Fulladu East	URD	143,817
			Nianija	CRD	9,148
			Niani	CRD	23,686
			Sami	CRD	20,544
			Fulladu West	CRD	90,416
			Niamina East	CRD	21,527
			Niamina West	CRD	7,293
			Niamina Dankunku	CRD	8,993
			McCarthy Island	CRD	2,470
				Total Bansang :	**441,134**
		Number			**2,230,679**
Total beds		2,231			
Beds 3	10%	223	**Nombre de lits secondaires :**		
Beds 2	30%	669		20% 132	**Bansang**
Beds 1	60%	1,338		11% 75	**Farafenni**
				69% 462	**RVH**
				100% **669**	

8.5 Annex A – 5:

CATCHMENT AREAS: BEDS I DISTRIBUTION

Scenario # 1

RHC	District	Division	2009	% Pop	Nber
Brikama	Foni Brefet	WD	11,752		
Brikama	Kombo Central	WD	148,948		
Brikama	Kombo East	WD	36,187		
Brikama	Kombo North	WD	299,886		
Brikama	Kombo South	WD	73,726		
	Brikama catchment area:		**570,499**	26%	**342**
Soma	Jarra Central	LRD	7,592		
Soma	Jarra East	LRD	13,935		
Soma	Jarra West	LRD	28,783		
Soma	Kiang Central	LRD	8,849		
Soma	Kiang East	LRD	7,548		
	Soma catchment area:		**66,706**	3%	**40**
Kuntaur	Niani	CRD	23,686		
Kuntaur	Nianija	CRD	9,148		
Kuntaur	Sami	CRD	20,544		
	Kuntaur catchment area:		**53,378**	2%	**32**
Basse	Fulladu East	URD	143,817		
Basse	Kantora	URD	50,293		
Basse	Sandu	URD	19,222		
Basse	Wuli	URD	43,725		
	Basse catchment area:		**257,057**	12%	**154**
Kerewan	Central Baddibu	NBD	21,435		
Kerewan	Jokadu	NBD	28,834		

Kerewan	Lower Baddibu	NBD	19,272		
Kerewan	Lower Niumi	NBD	63,055		
Kerewan	Upper Niumi	NBD	36,102		
	Kerewan catchment area:		**168,698**	8%	**101**
RHC sup.					
Serrekunda	Kanifing	KMC	769,362		
	Kanifing catchment area:		**769,362**	34%	**462**
Bwiam	Foni Bintang-Karenai	WD	12,377		
Bwiam	Foni Bondali	WD	6,232		
Bwiam	Foni Jarrol	WD	6,110		
Bwiam	Foni Kansala	WD	8,528		
Bwiam	Kiang West	LRD	16,931		
	Bwiam catchment area:		**50,179**	2%	**30**
Hospital					
RVH	Banjul	BCC	39,679		
	RVH catchment area:		**39,679**	2%	**24**
Farafenni	Lower Saloum	CRD	16,611		
Farafenni	Upper Baddibu	NBD	91,068		
Farafenni	Upper Saloum	CRD	16,742		
	Farafenni catchment area:		**124,421**	6%	**75**
Bansang	Fulladu West	CRD	90,416		
Bansang	McCarthy Island	CRD	2,470		
Bansang	Niamina Dankunku	CRD	8,993		
Bansang	Niamina East	CRD	21,527		
Bansang	Niamina West	CRD	7,293		
	Bansang catchment area:		**130,699**	6%	**78**
	Total population		**2,230,679**	100%	**1338**

Total Bed 1 : 1338

8.6 Annex A – 6:

CATCHMENT AREAS: BEDS I DISTRIBUTION

Scenario # 2

RHC	District	Division	2009	% Pop	Number
Brikama	Foni Brefet	WD	11,752		
Brikama	Kombo Central	WD	148,948		
Brikama	Kombo East	WD	36,187		
Brikama	Kombo North	WD	299,886		
Brikama	Kombo South	WD	73,726		
	Brikama catchment area:		**570,499**	26%	**342**
Soma	Jarra Central	LRD	7,592		
Soma	Jarra East	LRD	13,935		
Soma	Jarra West	LRD	28,783		
Soma	Kiang Central	LRD	8,849		
Soma	Kiang East	LRD	7,548		
	Soma catchment area:		**66,706**	3%	**40**
Kuntaur	Niani	CRD	23,686		
Kuntaur	Nianija	CRD	9,148		
Kuntaur	Sami	CRD	20,544		
	Kuntaur catchment area:		**53,378**	2%	**32**
Basse	Fulladu East	URD	143,817		
Basse	Kantora	URD	50,293		
Basse	Sandu	URD	19,222		
Basse	Wuli	URD	43,725		
	Basse catchment area:		**257,057**	12%	**154**
Essau	Jokadu	NBD	28,834		
Essau	Lower Niumi	NBD	63,055		
Essau	Upper Niumi	NBD	36,102		
	Essau catchment area:		**127,991**	6%	**77**

RHC sup.

Serrekunda	Kanifing	KMC	769,362		
	Kanifing catchment area:		**769,362**	34%	**462**
Bwiam	Foni Bintang-Karenai	WD	12,377		
Bwiam	Foni Bondali	WD	6,232		
Bwiam	Foni Jarrol	WD	6,110		
Bwiam	Foni Kansala	WD	8,528		
Bwiam	Kiang West	LRD	16,931		
	Bwiam catchment area:		**50,179**	2%	**30**

Hospital

RVH	Banjul	BCC	39,679		
	RVH catchment area:		**39,679**	2%	**24**
Farafenni	Lower Saloum	CRD	16,611		
Farafenni	Upper Baddibu	NBD	91,068		
Farafenni	Upper Saloum	CRD	16,742		
	Central Baddibu	NBD	21,435		
	Lower Baddibu	NBD	19,272		
	Farafenni catchment area:		**165,128**	7%	**99**
Bansang	Fulladu West	CRD	90,416		
Bansang	McCarthy Island	CRD	2,470		
Bansang	Niamina Dankunku	CRD	8,993		
Bansang	Niamina East	CRD	21,527		
Bansang	Niamina West	CRD	7,293		
	Bansang catchment area:		**130,699**	6%	**78**
	Total population		**2,230,679**	100%	**1338**
		Total Bed 1 :			**1338**

8.7 Annex A - 7

BEDS PER FACILITY

A - Total beds

Beds distribution (NBD)

	3	2	1	Total
RVH	223	462	24	709
Farafenni		75	***75***	149
Bansang		132	78	211
RHC			***1 162***	1 162
Total	223	669	1 338	2 231

Beds repartition (NBDE and NBDW)

	3	2	1	Total
RVH	223	462	24	709
Farafenni	-	75	***99***	174
Bansang	-	132	78	211
RHC	-	-	***1 137***	1 137
Total	223	669	1 338	2 231

B - Beds I

If NBD only		Beds		
	Division	**Required**	**Private**	**Adjusted**
RHC				
Brikama	WD	342	222	120 (1)
Soma	LRD	40	20	20
Kuntaur	CRD	32		32
Basse	URD	154		154
Kerewan	NBD	101	75	26

RHC suppl.				
Serrekunda	Kanifing	462		462 (1)
Bwiam	WD/LRD	30		30
Hospital				
RVH	BCC	24		24
Farafenni	CRD/NBD	75		75
Bansang	CRD	78		78
Total		1338		1338

If NBDE and NBDW		**Beds**		
	Division	**Required**	**Private**	**Adjusted**
RHC				
Brikama	WD	342	222	120 (1)
Soma	LRD	40	20	20
Kuntaur	CRD	32		32
Basse	URD	154		154
Esau	NBD	77	55	22
RHC suppl.				
Serrekunda	Kanifing	462		462 (1)
Bwiam	WD/LRD	30		30
Hospital				
RVH	BCC	24		24
Farafenni	CRD/NBD	75	20	55
Bansang	CRD	78		78
Total		1338		1338

(1) Special study required for validation.

C - Beds I, II, III

If NB only		Beds I			**Total Bed**
	Division	Required	Private	Adjusted	**Required**
RHC					
Brikama	WD	342	222	120 (1)	**120 (1)**

Soma	LRD	40	20	20	**20**
Kuntaur	CRD	32		32	**30**
Basse	URD	114		114	**115**
Yoro Bawol	URD	40		40	**40**
Kerewan	NBD	101	75	26	**30**
RHC suppl.					
Serrekunda	Kanifing	462		462 (1)	**230 (1)**
Bwiam	WD/LRD	30		30	**30**
Hospital					
RVH	BCC	24		24	**710**
Farafenni	CRD/NBD	75		75	**150**
Bansang	CRD	78		78	**210**
Total		1338		1338	**1685**

If NBDE and NBDW		Beds			**Total Bed**
	Division	Required	Private	Adjusted	**Required**
RHC					
Brikama	WD	342	222	120 (1)	**120 (1)**
Soma	LRD	40	20	20	**20**
Kuntaur	CRD	32		32	**30**
Basse	URD	114		114	**115**
Yoro Bawol	URD	40		40	**40**
Esau	NBD	77	55	22	**20**
RHC suppl.					
Serrekunda	Kanifing	462		462 (1)	**230 (1)**
Bwiam	WD/LRD	30		30	**30**
Hospital					
RVH	BCC	24		24	**710**
Farafenni	CRD/NBD	75	20	55	**160**
Bansang	CRD	78		78	**210**
Total		1338		1338	**1685**

(1) Special study required to validate these figures.

8.8 Annex B – 1:

CIVIL WORKS IMPLEMENTATION					
Implementation by Division					
		IHC	**RHC**	**PERIOD**	**FUNDING****
URD	New IHC's	3,976,870.86		II	
	Rehab IHC's	619,415.88		II	WB, ADB, EDF, GG, others
	Basse RHC		2,414,144.40	II	ADB
CRD	New IHC's	1,447,817.28		III	
	Rehab IHC's	965,211.52		III	WB, ADB, GG, others
	Kuntaur RHC		1,462,234.52	I	ADB
LRD	New IHC's	456,751.88		IV	
	Rehab IHC's	456,751.88		IV	WB, ADB, GG, others
	Soma RHC		496,153.46	IV	others
NBD	New IHC's	2,369,939.00		II	
	Rehab IHC's	829,478.65		II	Italian Govt., EDF, GG
	Kerewan RHC		1,386,601.70	II	others
	Essau RHC*		1,386,601.70	II	Others
WD	New IHC's	1,977,821.82		I	
	Rehab IHC's	659,273.94		I	WB, ADB, EDF, others
	Bwiam RHC		224,154.65	IV	Others
	Brikama RHC		2,120,248.56	I	Others
KMC	New IHC's	3,231,735.00		IV	
	Rehab IHC's	538,622.50		IV	WB, ADB, others
	Serrekunda RHC		854,788.00	IV	others
		7,529,690.20	**10,344,926.99**		

* Optional

** Possible finance source for GOTG to consider and follow up.

PERIOD	Years
I	1,2,3
II	4,5
III	6,7,8

IV 9,10

Order of implementing by Division

		IHC	RHC	PERIOD	FUNDING**
WD	New IHC's	1,977,821.82		I	WB, etc
WD	Rehab IHC's	659,273.94		I	WB, etc
WD	Brikama RHC		2,120,248.56	I	
URD	Basse RHC		2,414,144.40	I	ADB
CRD	Kuntaur RHC		1,462,234.52	I	ADB
URD	New IHC's	3,976,870.86		II	WB, etc
URD	Rehab IHC's	619,415.88		II	WB, etc
NBD	New IHC's	2,369,939.00		II	Italian Govt.
NBD	Rehab IHC's	829,478.65		II	Italian Govt.
CRD	New IHC's	1,447,817.28		III	WB, etc
CRD	Rehab IHC's	965,211.52		III	WB, etc
NBD	Kerewan RHC		1,386,601.70	III	
NBD	Essau RHC*		1,386,601.70	III	
LRD	New IHC's	456,751.88		IV	WB, etc
LRD	Rehab IHC's	456,751.88		IV	WB, etc
LRD	Soma RHC		496,153.46	IV	
WD	Bwiam RHC		224,154.65	IV	
KMC	New IHC's	3,231,735.00		IV	WB, etc
KMC	Rehab IHC's	538,622.50		IV	WB, etc
KMC	Serrekunda RHC		854,788.00	IV	
		7,529,690.20	**10,344,926.99**		

8.9 Annex B – 2

SUMMARY OF CIVIL WORKS COST ESTIMATES

MAJOR HEALTH CENTRES

Division	Major Health Centre	Description	(US) $
URD	BASSE	New 120 bed facility	2,414,144.40
CRD	KUNTAUR	New 30 bed facility	1,462,234.52
LRD	SOMA	Additional medical & support services	496,153.46
NBD	KEREWAN	New 30 bed facility	1,386,601.70
	ESSAU*	New 30 bed facility	1,386,601.70
WD	BWIAM	Minor alterations to new facility	224,154.65
	BRIKAMA	New 120 bed facility	2,120,248.56
KMC	SERREKUNDA	Additional 120 bed wards	854,788.00
	TOTAL		**$10,344,926.99**

*Optional

MINOR HEALTH CENTRES

Division	Location factor	Minor Health Centre	Description	no.	(US) $
URD	*1.15*	YORROBAWOL**	45 bed facility	1	1,251,441.01
		NEW		11	2,725,429.85
		REHAB. &/or EXTEND EXISTING FACILITY		5	619,415.88
CRD	*1.12*	NEW		6	1,447,817.28
		REHAB. &/or EXTEND EXISTING FACILITY		8	965,211.52
LRD	*1.06*	NEW		2	456,751.88
		REHAB. &/or EXTEND EXISTING FACILITY		4	456,751.88
NBD	*1.10*	NEW		10	2,369,939.00
		REHAB. &/or EXTEND EXISTING FACILITY		7	829,478.65
WD	*1.02*	NEW		9	1,977,821.82

		REHAB. &/or EXTEND EXISTING FACILITY		6	659,273.94
KMC &	*1.00*	NEW		15	3,231,735.00
BCC		REHAB. &/or EXTEND EXISTING FACILITY		5	538,622.50
		TOTAL		**89**	**$17,529,690.20**

**this is the only MiHC with in-patients

Division	**Location factor**	**description**		**no.**	**(US) $**
URD	*1*	Trekking Stations		60	374,400.00
CRD	*1*	Trekking Stations		75	468,000.00
LRD	*1*	Trekking Stations		40	249,600.00
NBD	*1*	Trekking Stations		65	405,600.00
WD	*1*	Trekking Stations		75	468,000.00
KMC &	*1*	Trekking Stations		0	-
BCC					
Extra for Village Health Posts that are not located in a Key Village				53	56,700.00
		TOTAL		**368**	**$1,965,600.00**

assumptions;

each IHC supports six Trekking Stations or VHP in a Key Village

costs based on 3 consulting room

8.10 Annex B – 3: CASH FLOW AS PER IMPLEMENTATION SCHEDULE

Division	location factor		Nos.	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	NEW IHC'S	REHAB IHC'S	RHC's	FUNDING**
URD	1.15	New IHC's	11	705,868					705,868	705,868	705,868	705,868	352,934	3,882,272			WB, etc
	1.15	Rehab IHC's	5		176,467	176,467	176,467	352,934							882,335		WB, etc
	1.15	Yorobawol IHC					625,721	625,721							1,251,441		ADB
	1.15	Basse RHC			1,207,072	1,207,072										2,414,144	ADB
CRD	1.12	New IHC's	6	687,454					343,727	343,727	343,727	343,727		2,062,361			WB, etc
	1.12	Rehab IHC's	8		343,727	343,727	343,727	343,727							1,374,908		WB, etc
	1.12	Kuntaur RHC					731,117	731,117								1,462,235	ADB
LRD	1.06	New IHC's	2	325,313					325,313					650,626			WB, etc
	1.06	Rehab IHC's	4		162,656	162,656	162,656	162,656							650,626		WB, etc
	1.06	Soma RHC										248,077	248,077			496,153	
NBD	1.1	New IHC's	10	675,178					675,178	675,178	675,178	337,589	337,589	3,375,889			Italian Govt.
	1.1	Rehab IHC's	7		168,794	337,589	337,589	337,589							1,181,561		Italian Govt.
	1.1	Kerewan RHC					693,301	693,301								1,386,602	
WD	1.02	New IHC's	9	626,074					626,074	626,074	313,037	313,037	313,037	2,817,333			WB, etc
	1.02	Rehab IHC's	6		156,518	156,518	313,037	313,037							939,111		WB, etc
	1.02	Brikama RHC			1,060,125	1,060,125										2,120,249	
	1.02	Bwiam RHC											224,155			224,155	
KMC	1	New IHC's	15	306,899					613,798	920,697	920,697	920,697	920,697	4,603,485			WB, etc
	1	Rehab IHC's	5		153,450	153,450	153,450	306,899							767,248		WB, etc
	1	Serrekunda RHC										427,394	427,394			854,788	
		TOTAL	**88**	**3,326,785**	**3,428,809**	**3,597,604**	**3,537,064**	**3,866,981**	**3,289,957**	**3,271,543**	**2,958,506**	**3,296,388**	**2,823,882**	**17,391,966**	**7,047,229**	**8,958,326**	
optional																	
NBD	1.1	Essau RHC*		1,386,602													

IMPLEMENTATION SCHEDULE

Division	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
INTEGRATED HEALTH CENTRES										
	CONSTRUCTION OF 10 Nos. NEW IHC's ←		REHAB OF 36 Nos. IHC'S	→		CONSTRUCTION OF 53 Nos. NEW IHC'S			→	
URD	2	1	1	1	2	2	2	2	2	1
CRD	2	2	2	2	2	1	1	1	1	
LRD	1	1	1	1	1	1				
NBD	2	1	2	2	2	2	2	2	1	1
WD	2	1	1	2	2	2	2	1	1	1
KMC	1	1	1	1	2	2	3	3	3	3
TOTAL	**10**	**7**	**8**	**9**	**11**	**10**	**10**	**9**	**8**	**6**
			YOROBAWOL							
REFERRAL HEALTH CENTRES										
URD	BASSE									
CRD			KUNTAUR							
LRD								SOMA		
NBD			KEREWAN							
WD	BRIKAMA								BWIAM	
KMC								SERREKUNDA		

8.11 Annex C – 1

Standard list of rooms and equipment for health facilities

1. Village health services

1.1 Facilities

In villages where this category of facility exists (trekking stations linked to MiHCs), it will comprise:

- One room, with around 10 sq. metres
- One area for IEC and EPI activities. This area could be a terrace, a veranda or another type of covered area (around 20 to 30 sq. metres).

1.2 Equipment

	Designation	**Qty**
Outside activities area		
	Bench	5
	Notice board	1
	Blackboard	1
	Designation	**Qty**
Village health room		
	Table, standard	1
	Chair, standard	3
	Cupboard	1
	TBA delivery kit	1
	Weighing scale, infant, portable	1
	Arm circumference tape	1
	Kocher forceps, straight, 18 cm	2
	Angular bandage scissors, 18 cm	1
	Sponge bowl stainless steel, 600 ml	2
	Steam steriliser	1
	Solar lamp	1
	Mosquito net dipping equipment	1

2. Minor Health Centres (MiHC) - room by room areas

2.1 Main rooms

Room designation	**Area (in Sq. meters)**
Waiting room / reception	20
Antenatal room (including FP and ANC)	16
Growth follow-up and immunisation room	12
Delivery room	20
Observation room (2 beds)	14
Sluice	6
Post-natal room (4 beds)	30
Curative consultations room	16
Aseptic treatment room (injections)	9

Septic treatment room (dressings)	9
Laboratory (in some specific IHC)	9
Kitchen / culinary demonstration	30
Food storage	10
Drugs storage	12
Pharmacy	8
Storage	10
Veranda (following architectural design)	20
Total	**251**

Access of the population of Upper River Division North (notably Wuli and Sandu) to the MaHC in Basse is difficult, hence a small operating theatre capable of handling urgent surgical operations (especially caesarians) is proposed for Yorobawol equipped as follows:

Operating theatre (Yorobawol)	
- Patients lock	12
- Scrub-up	4
- Operating room	20
- Sterilisation	20
- Shower	2
- Toilette	2

2.2 Annexe rooms

- Toilets
  - 1 for the staff
  - 2 for the patients and their families
- Shower (for the delivered women)
- Water supply system
  - Well
  - Pump
  - Water tower
- Liquid waste elimination system
- Solid waste elimination system (incinerator)

2.3 Personnel housing

- 55 sq. metres for the Nurse
- 55 sq. metres for the mid-wife

2.4 Family housing

18 sq. metres (six of which for cooking).

2.5 Fence (following the area of the health facility)

2.6 MiHC

	Designation	**Qty**
Waiting room / reception		
	Bench	5
	Table, standard	1
	Chair, standard	1
	Notice board	1
	Blackboard	1
	Designation	**Qty**
Antenatal room (including FP and ANC)		
	Cupboard	1
	Weighing scale with measuring road, adult	1
	Dish, kidney	1
	Cotton container s/s with hinged lid	1
	Desk, 1 pedestal	1
	Chair, standard	3
	Dressing trolley s / s with bin	3
	Bowl 1 l	1
	Foetal heat detector	1
	Steps, couch, 2 steps	1
	IUD instrument set	2
	Vaginal specula set	1
	Screen – 3 panels	1
	Washing bottle, plastic	2
	Instrument tray, rectangular	1
	Waste bin foot operated	1
	Metallic catheter	1
	Stethoscope	1
	Foetal stethoscope	1
	Gynaecological couch with Goepel leg-rests	1
	Compress container	1
	Sphygmomanometer, armband, adult	1
	Kit HF, transceiver, base station	1
	Designation	**Qty**
Growth follow-up and immunisation		
	Cupboard	1
	Dish, kidney	1
	Cotton container s/s with hinged lid	1
	Desk, 1 pedestal	1
	Chair, standard	3

	Trolley, two S/S shelves	3
	Bowl 1 l	1
	Steps, couch, 2 steps	1
	Vaccine carrier	1
	Screen – 3 panels	1
	Weighing scale, infant, portable	1
	Weighing scale, infant	1
	Washing bottle, plastic	2
	Instrument tray, rectangular	1
	Stove, single burner	1
	Refrigerator	1
	Waste bin foot operated	1
	EPI Portable autoclave	1
	Stethoscope	1
	Examination couch	1
	Compress container	1
	Baby measuring rod – table use	1
Delivery room		
	Aspirator, foot operated	1
	Bed pan	2
	Dish, kidney	2
	Cotton container s/s with hinged lid	2
	Bowl 1 l	2
	Basin, 10 litres	2
	Foetal heart detector	1
	Steps, couch, 2 steps	2
	Delivery / episiotomy set	2
	Solar lamp	1
	Weighing scale, infant	1
	Washing bottle, plastic	2
	Instrument tray, rectangular	2
	Infusion stand	1
	Waste bin foot operated	1
	Metallic probe	2
	Stethoscope	1
	Foetal stethoscope	1
	Trolley, two s / s shelves	2
	Baby dressing unit	1
	Bed, birthing	2
	Compress container	2
	Sphygmomanometer, armband, adult	1
Observation room (2 beds)		
	Solar lamp	1
	Bed, with mattress	2
	Bedside locker	2
Post-natal room (4 beds)		
	Solar lamp	1
	Bed, with mattress	4
	Bedside locker	4
Curative consultations room		
	Cupboard	1
	Weighing scale with measuring road, adult	1
	Dressing forceps + jar	1
	Desk, wooden	1

	Chair, standard	3
	Eye chart	1
	Steps, couch, 2 steps	1
	Vaginal specula set	1
	Diagnostic set	1
	Weighing scale, infant	1
	Washing bottle, plastic	2
	Instrument tray, rectangular	1
	Waste bin foot operated	1
	Stethoscope	1
	Examination couch	1
	Sphygmomanometer, armband, adult	1
Aseptic treatment room (injections)		
	Single glass door, instruments, cabinet	1
	Table, standard	1
	Chair, standard	2
	Dish, kidney	1
	Dressing forceps + jar	1
	Cotton container s/s with hinged lid	1
	Trolley, two s / s shelves	1
	Washing bottle, plastic	2
	Instrument tray, rectangular	1
	Waste bin foot operated	1
	Stool	1
	Compress container	1
Septic treatment room (dressings)		
	Single glass door, instruments, cabinet	1
	Table, standard	1
	Chair, standard	2
	Basin, 10 litres	1
	Dish, kidney	1
	Dressing forceps + jar	1
	Cotton container s/s with hinged lid	1
	Dressing trolley s / s with bin	1
	Steps, couch, 2 steps	1
	Gastric wash set	1
	Dressing / suture set	2
	Washing bottle, plastic	2
	Instrument tray, rectangular	1
	Ear washing rubber bulb complete	1
	Waste bin foot operated	1
	Examination couch	1
	Stool	1
	Compress container	1
Laboratory		
	Table, standard	1
	Chair, standard	1
	Trolley, two S/S shelves	1
	Centrifuge hand operated	1
	Hemoglobinometer	1
	Microscope binocular	1
	Manual slide stainer	1

	General glassware for IHC laboratory[7]	1
	Timer, table model	1
	Chronometer	1
	Cotton container s/s with hinged lid	1
	Washing bottle, plastic	1
Kitchen / culinary demonstration		
	Set of pans	1
	Set of crockery	1
	Set of cutlery	1
	Shelving unit (1 m)	3
Food storage		
	Shelving unit (1 m)	3
Drugs storage		
	Cupboard	1
	File box	1
	Chair	1
	Steps 1,5 m	1
	Shelving unit (1 m)	2
	Table, standard	1
Pharmacy		
	File box	1
	Portable security chest	1
	Solar calculator	1
	Chair	1
	Shelving unit (1 m)	2
	Table, standard	1
Storage		
	Bed pan	1
	Infusion stand	6
	Shelving unit (1 m)	3
	Stove, single burner	1
	Portable autoclave	1
	Urinal, male, plastic	1
Operating theatre (Yorobawol)		
- Patients lock		
	Patient transfer stretcher	1
	Trolley, 2 s /s shelves	1
	Infusion stand, castors	1
- Scrub-up		
	Wardrobe	1
	Scrub sink – one station	1
- Operations room		
	Anaesthesia unit	1
	Double glass door, cabinet, instruments	1
	Surgical aspirator, mobile	1
	Mayo table, S / S	1
	Air-conditioning unit	1
	Oxygen concentrator	1
	Kick bucket with castors	1
	Light, surgical, mobile, with battery	1
	Resuscitator, pulmonary, manual, adult	1

[7] See list of items in annexe.

	Resuscitator, pulmonary, manual, children	1
	Dressing instrument set	1
	Caesarean instrument set	2
	Curettage instrument set	2
	Hernia surgery instrument set	2
	Intubation instrument set, adults	1
	Intubation instrument set, children	1
	Laparotomy instrument set	1
	Tying of Fallopian tubes instrument set	1
	Tracheotomy instrument set	1
	Vasectomy instrument set	1
	Instrument tray, rectangular	1
	Infusion stand, castors	1
	Waste bin, foot operated	1
	Stethoscope	1
	Table, instruments	2
	Operating table	1
	Stool with screw-height adj., castors	1
	Compress container	2
	Sphygmomanometer	1
- Sterilisation		
	Cupboard	1
	Operating linen grant	1
	Sterilisation drum set	1
	Shelving unit (1 m)	5
	Steriliser, dry heat	1
	Autoclave, vertical, 90 litres	1

3. Major Health Centres

3.1 MaHC - room by room areas

The profile of the offer of Referral Health Centres is the same for the facilities with 60.000 to 150.000 beds.

Rooms designation	**Area (in square metres)**
Administrative unit (to be reviewed according to Gambian organisational chart for health structures)	
- Medical officer	16
- SNO officer	14
- Secretary's office	12
- Accounts office	12
- Meeting room / library	30
- Reception / recording	9
- Cashiers' office	9
- Health Information System Management	9
- Archives / patients records	20
Reception / sorting office / emergencies / out-patient	
- Reception / sorting office	12
- Waiting room	16
- Emergency room	16
- Minor operating room	16

- Observation room	28
- Staff duty room	9
- Pharmacy	9
- Referral consultation room # 1	12
- Referral consultation room # 2	12
- Oral care room	20
- Drugs storage	40
Laboratory	
- Waiting room / reception	9
- Sample collection room	9
- Laboratory room	30
- Blood transfusion room	20
- Toilets (staff)	3
- Toilets (patients)	3
Medical imaging	
- Radiological examinations room	30
- Dark room	8
- Interpretation / storage	12
- Ultrasound examinations room	9
Operating theatre	
- Patients lock	12
- Scrub-up	08
- Operating room #1	30
- Operating room #2	30
- Rest room	9
- Sterilisation	30
- Sterile supplies	9
- Post-operating room (2 beds)	20
- Staff duty room	9
- Shower	4
- Toilette	3
Maternity	
- Midwife's room	9
- Midwife duty room	9
- Labour room (2 beds)	15
- Delivery room (4 beds)	30
- Postnatal room	7 m² / bed
- Neonatal room	12
- Storage	4
- Dirty linen	4
Other in-patient rooms	
- Nursing care	12
- Head nurse's office	9
- Ward	7 m² /lit (men / female / children according to the number of beds)
- Staff duty room	9
- Storage	4
- Dirty linen	4
Laundry	

- Dirty linen reception and storage	8
- Washing area	20
- Drying area / ironing	30
- Sewing room	12
- Clean linen storage and distribution	16
Central store	
	40 m² with security door and set of shelves
Mortuary	
	10 m², with deathbed made of reinforced concrete with central evacuation hole.
Incinerator (elimination of solid waste)	
	According to standard plan
Generator house	
	10
Family / escorts housing	
- Housing	30
- Cooking area	12
Sanitary appliances	
	2 sets of 2 WC + 2 showers per ward
	2 sets of 4 pit latrines and 2 showers outside
	1 exterior washing tank for the families (covered)
Security agents cabin	
	4 m²
Fence	
	According to the hospital area.

3.2 Referral Health Centre room by room equipment:

Administrative unit

	Designation	*8.11.1.ty*
Offices:		
- Medical officer:		
	Cupboard	1
	Executive desk	1
	Chair upright, with arms	1
	Guest chair	2
	Conference table	1
	Conference chair	4
	Telephone	1
- SNO officer		
	Cupboard	1
	Executive desk	1
	Chair upright, with arms	1
	Guest chair	2
	Calculator	1
	Computer	1
- Secretary's office		
	Cupboard	1

	Workstation	1
	Secretary chair	2
	Stacking chair	1
- Accounts office		
	Cupboard	1
	Workstation	1
	Managerial chair	1
	Office safe	1
	Stacking chair	1
	Calculator	1
- Meeting room / library		
	Stacking chair	15
	Shelving unit (1 m)	4
	Modular conference table	1
	Marker board	1
	In cities with available power supply:	
	- Slide projector	1
	- Overhead projector	1
	- Ventilator	1
- Reception / recording		
	Cupboard	1
	Workstation	1
	Chair, standard	1
- Cashier's office	Workstation	1
	Chair, standard	2
	Portable security chest	1
	Calculator	1
- Health Information System Management		
	Cupboard	1
	Workstation	1
	Stacking chair	2
	Chair, standard	1
	Computer	1
- Archives / patients records		
	Shelving unit (1 m),	12
	Table, standard	1
	Chair, standard	

Reception / Sorting office / emergency / out-patient

- Reception / sorting office		
	Cupboard	1
	Patient transfer stretcher	1
	Workstation	1
	Chair, standard	1
	Steps, couch, 2 steps	1
	Folding wheelchair	1
	Light, examination	1
	Babinski reflex hammer	1
	Stethoscope	1
	Examination couch	1
	Sphygmomanometer	1
	Kit HF, transceiver, bases station	1
- Waiting room		

	Bench	5
	Table, standard	1
	Chair, standard	1
	Notice board	1
- Emergency room		
	Cupboard	1
	Splint, upper limbs	1
	Splint, lower limbs	1
	Autoclave, tabletop	1
	Dish, kidney	2
	Dressing forceps + jar	2
	Complete enema set	1
	Cotton container s/s with hinged lid	2
	Chair, standard	1
	Dressing trolley s / s with bin	1
	Bowl 1 l	2
	Steps, couch, 2 steps	1
	Resuscitator, pulmonary, manual, adult	1
	Resuscitator, pulmonary, manual, child	1
	Metallic vesical catheter set	1
	Gastric wash set	1
	Emergency ENT set	1
	Light, examination	1
	Babinski reflex hammer	1
	Clar mirror	1
	Ophtalmoscope	1
	Screen – 3 panels	1
	Washing bottle, plastic	2
	Instrument tray, rectangular	3
	Infusion stand	4
	Waste bin, foot operated	2
	Stethoscope	1
	Table, standard	1
	Examination couch	1
	Compress container	2
	Sphygmomanometer	1
- Minor operating room		
	Single glass door, cabinet, instruments	1
	Mobile surgical aspirator	1
	Air-conditioning unit	1
	Kick bucket with trolley Cuve	1
	Light, surgical, mobile	1
	Dressing instrument set	2
	Intubation instrument set, adults	1
	Intubation instrument set, children	1
	Small surgery instrument set	2
	Tracheotomy intrument set	1
	Laryngoscope	1
	X-ray viewing box – 2 panels	1
	Instrument tray, rectangular	1
	Infusion stand, castors	1
	Waste bin, foot operated	1
	Stethoscope	1
	Table, instruments	2

	Minor operating table	1
	Stool with screw-height adj, castors	1
	Compress container	2
	Sphygmomanometer	1
- Observation room		
	Dressing trolley s / s with bin	1
	Hospital bed, with mattress	4
	Infusion stand, castors	4
- Staff duty room		
	Bed, with mattress	1
	Bedside locker	1
	Chair, standard	1
	Wardrobe	1
- Pharmacy		
	File box	1
	Portable security chest	1
	Solar calculator	1
	Chair	1
	Shelving unit (1 m)	4
	Table, standard	1
- Referral consultation room # 1		
	Cupboard	1
	Weighing scale with measuring road, adult	1
	Weighing scale, infant	1
	Desk, 1 pedestal	1
	Chair, standard	2
	Foetal heart detector	1
	Eye chart	1
	Steps, couch, 2 steps	1
	Managerial chair	1
	Vaginal specula set	2
	ENT diagnosis instrument set	1
	Light, examination	1
	Babinski reflex hammer	1
	X-ray viewing box – 2 panels	1
	Ophtalmoscope	1
	Washing bottle, plastic	1
	Waste bin, foot operated	1
	Stethoscope	1
	Examination couch	1
	Sphygmomanometer	1
- Referral consultation room # 2		
	Cupboard	1
	Weighing scale with measuring road, adult	1
	Weighing scale, infant	1
	Desk, 1 pedestal	1
	Chair, standard	2
	Foetal heart detector	1
	Eye chart	1
	Steps, couch, 2 steps	1
	Managerial chair	1
	Vaginal specula set	2
	ENT diagnosis instrument set	1
	Light, examination	1

	Babinski reflex hammer	1
	X-ray viewing box – 2 panels	1
	Ophtalmoscope	1
	Washing bottle, plastic	1
	Waste bin, foot operated	1
	Stethoscope	1
	Examination couch	1
	Sphygmomanometer	1
- Drugs storage		
	Cupboard	1
	Precision balance	1
	Chair	1
	Steps, 1.5 m	1
	Shelving unit (1 m)	6
	Refrigerator	1
	Table, standard	1
	Wall thermometer	1

Laboratory

- Waiting room / reception		
	Bench for waiting room	3
	Chair, standard	1
	Table, standard	1
- Sample collection room		
	Cupboard	1
	Cotton container s/s with hinged lid	2
	Sample collection chair	1
	Washing bottle, plastic	2
	Instrument tray, rectangular	1
	Waste bin, foot operated	1
	Compress container	2
	Trolley, two S/S shelves	1
- Laboratory room		
	Distilling unit – 2 litres per hour	1
	Culture incubator	1
	Autoclave, tabletop	1
	Micro-pipetter device for blood dilution pipettes	1
	Westergreen stand complete	1
	Cupboard	2
	Polyethylene tin, with handle and tap – 10 l	2
	Desk, 1 pedestal	1
	Electric centrifuge	1
	Manual centrifuge	1
	Chair	2
	Table, standard	2
	Haemoglobinometre	1
	Cell counter chamber, Neubauer with cover glass	2
	Cell counter chamber, Fuchs Rosenthal with cover glass	2
	Mechanical cell counter – 4 digits – manual model	1
	Mechanical cell counter- differential	1

	Alcohol lamp	1
	Rhesuscope	
	Bunsen burner	1
	General glassware for Referral Health Centre[8]	1
	Microscope binocular	2
	Electronic timer / chronometer – acoustic alarm	1
	Polyethylene washing bottle – 500 ml	2
	Refrigerator	1
	Waste bin – foot operated	1
	Spectrophotometer UV / visible	1
	Tension stabiliser for spectrophotometer	1
	Stool with screw-height adj., castors	4
- Blood transfusion room		
	Examination couch	1
	Steps, couch, 2 steps	
	Cupboard	1
	Cotton container s/s with hinged lid	2
	Washing bottle, plastic	2
	Instrument tray, rectangular	1
	Waste bin, foot operated	1
	Compress container	2
	Trolley, two S/S shelves	1
	Blood bank	1
Medical imaging		
- Radiological examination room		
	Set of X-ray film cassettes	
	Set of X-ray film mounts	1
	X-ray protection equipment set	1
	Partition with leaded window	1
	Lead marker text , complete set	2
	Basic radiological system	1
- Dark room		
	Light inactiving	1
	Waste bin	1
	X-ray film processor, manual	1
- Interpretation / storage		
	Cupboard	1
	Chair, standard	1
	Workstation	1
	X-ray viewing box – 2 panels	1
- Ultrasound examinations room		
	Scanner, ultrasonic, general purpose	1
	Workstation	1
	Chair, standard	1
	Table, ultrasound examinations	1
	Stool with screw-height adj., castors	1
- Dentistry		
	Complete dental chair, with handpieces and contrangles	1
	Dental X-ray unit	1

[8] Cf. composition in annexe.

	Air-compressor machine	1
	Autoclave, tabletop	1
	Amalgamator	1
	Dental X-ray development unit	1
	Instrument trays	2
	Dish, kidney (large)	2
	Dish, kidney, (small)	2
	Single glass door, instruments, cabinet	1
	Dental instrument set	2
Operating theatre		
- Patients lock		
	Cupboard	1
	Patient transfer stretcher	1
	Trolley, 2 s /s shelves	1
	Infusion stand, castors	1
- Scrub-up		
	Wardrobe	2
	Scrub sink – one station	1
- Operations room # 1		
	Anaesthesia unit	1
	Double glass door, cabinet, instruments	1
	Surgical aspirator, mobile	1
	Mayo table, S / S	1
	Electrosurgical unit, general purpose	1
	Air-conditioning unit	1
	Oxygen concentrator	1
	Kick bucket with castors	1
	Light, surgical, mobile, with battery	1
	Ceiling light, surgical,	1
	Resuscitator, pulmonary, manual, adult	1
	Resuscitator, pulmonary, manual, children	1
	Dressing instrument set	1
	Amputation instrument set	1
	Caesarean instrument set	2
	Curettage instrument set	2
	Gynaecological surgery instrument set	1
	Hernia surgery instrument set	2
	Hysterectomy instrument set	1
	Intubation instrument set, adults	1
	Intubation instrument set, children	1
	Laparotomy instrument set	1
	Tying of Fallopian tubes instrument set	1
	Tracheotomy instrument set	1
	Vasectomy instrument set	1
	X-ray viewing box – 2 panels	1
	Instrument tray, rectangular	1
	Infusion stand, castors	1
	Waste bin, foot operated	1
	Stethoscope	1
	Table, instruments	2
	Operating table	1
	Stool with screw-height adj., castors	1
	Compress container	2
	Sphygmomanometer	1

- Operations room # 2		
	Anaesthesia unit	1
	Double glass door, cabinet, instruments	1
	Surgical aspirator, mobile	1
	Mayo table, S / S	1
	Electrosurgical unit, general purpose	1
	Air-conditioning unit	1
	Oxygen concentrator	1
	Kick bucket with castors	1
	Light, surgical, mobile, with battery	1
	Ceiling light, surgical,	1
	Resuscitator, pulmonary, manual, adult	1
	Resuscitator, pulmonary, manual, children	1
	Dressing instrument set	1
	Amputation instrument set	1
	Caesarean instrument set	1
	Curettage instrument set	2
	Gynaecological surgery instrument set	2
	Hernia surgery instrument set	1
	Hysterectomy instrument set	2
	Intubation instrument set, adults	1
	Intubation instrument set, children	1
	Laparotomy instrument set	1
	Tying of Fallopian tubes instrument set	1
	Tracheotomy instrument set	1
	Vasectomy instrument set	1
	X-ray viewing box – 2 panels	1
	Instrument tray, rectangular	1
	Infusion stand, castors	1
	Waste bin, foot operated	1
	Stethoscope	1
	Table, instruments	1
	Operating table	2
	Stool with screw-height adj., castors	1
	Compress container	1
	Sphygmomanometer	2
- Rest room		
	Coffeemaker	1
	Chair	1
	Armchair	4
	Refrigerator	1
	Coffee table	1
	Ventilator	1
- Sterilisation		
	Cupboard	1
	Operating linen grant	1
	Sterilisation drum set	1
	Shelving unit (1 m)	5
	Steriliser, dry heat	1
	Autoclave, horizontal, single door	1
- Sterile supplies		
	Shelving unit (1 m)	4
	Cupboard	1
- Post-operating room (2 beds)		

	Surgical aspirator, mobile	1
	Dish, kidney	1
	Cotton container s/s with hinged lid	1
	Dressing trolley s / s with bin	1
	Bowl 1 l	1
	Hospital bed, with mattress	2
	Washing bottle, plastic	1
	Instrument tray, rectangular	1
	Infusion stand, castors	2
	Stethoscope	1
	Compress container	1
	Wall sphygmomanometer	1
- Staff duty room		
	Wardrobe	1
	Chair, standard	1
	Bed, with mattress	1
	Bedside locker	1
Maternity ward		
- Midwife's room		
	Cupboard	1
	Weighing scale with measuring road, adult	1
	Dish, kidney	1
	Dressing forceps + jar	1
	Cotton container s/s with hinged lid	1
	Workstation	1
	Chair, standard	2
	Bowl, 1 l	1
	Foetal heart detector	1
	Steps, couch, 2 steps	1
	Armchair	1
	Vaginal specula set	1
	Light, examination	1
	Screen – 3 panels	1
	Washing bottle, plastic	1
	Instrument tray, rectangular	1
	Stethoscope	1
	Foetal stethoscope	1
	Gynaecological couch with Goepel leg-rests	1
	Compress container	1
	Sphygmomanometer	1
- Midwife's duty room		
	Wardrobe	1
	Chair, standard	1
	Bed, with mattress	1
	Bedside locker	1
- Labour room (2 beds)		
	Bed pan	2
	Bed, with mattress	2
	Infusion stand	2
- Delivery room (4 beds)		
	Cupboard	1
	Aspirator, foot operated	2
	Weighing scale, infant	1
	Dish, kidney	2

	Bed pan	2
	Dressing forceps + jar	4
	Complete enema set	1
	Cotton container s/s with hinged lid	4
	Patient transfer stretcher	1
	Bowl, 1 l	4
	Kick bucket with trolley	2
	Light, surgical, mobile, with battery	2
	Steps, couch, 2 steps	4
	Resuscitator, pulmonary, manual, adult	1
	Delivery / episiotomy set	4
	Curettage instrument set	2
	Vaginal specula set	4
	Light, examination	2
	Solar lamp	1
	Washing bottle, plastic	2
	Waste bin, foot operated	2
	Stethoscope	1
	Foetal stethoscope	1
	Foetal heart detector	1
	Table, instruments	2
	Baby dressing unit	1
	Bed, birthing	4
	Compress container	2
	Sphygmomanometer	1
	Baby measuring rod – table use	1
	Aspirator, uterine	1
- Postnatal room		
	Bed pan	6
Observation: The number of beds will be defined later, in the frame of the health mapping.	Hospital bed, with mattress	p.m.
	Infusion stand	10
	Bedside locker	p.m.
	Crib, pivoting wheels, with mattress	p.m.
- Neonatal room		
	Incubator, infant	2
- Storage		
	Shelving unit (1 m)	2
- Dirty linen		
	Single bag, dirty linen trolley	1
Other in-patient		
- Treatment room		
	Cupboard	1
	Dish, kidney	1
	Dressing forceps + jar	1
	Cotton container s/s with hinged lid	1
	Dressing trolley s / s with bin	1
	Steps, couch, 2 steps	1
	Dressing instrument set	2
	Solar lamp	1
	Screen – 3 panels	1
	Washing bottle, plastic	2
	Instrument tray, rectangular	1
	Ear washing rubber bulb complete	1

	Waste bin, foot operated	1
	Metallic urethral catheter	1
	Table, standard	1
	Examination couch	1
	Compress container	1
- Head nurse's room		
	Cupboard	1
	Workstation	1
	Chair, standard	2
Observation: The number of beds will be defined later, in the frame of the health mapping.	Armchair	1
- In-patient		
Observation: The number of beds will be defined later, in the frame of the health mapping. The designer will include at least 3 one-bed rooms for the isolated patients.	Hospital bed with mattress	p.m.
	Bedside locker	p.m.
	Infusion stand	10
	Bed pan	6
	Urinal, male	**6**
- Staff duty room		
	Wardrobe	1
	Chair, standard	1
	Bed, with mattress	1
	Bedside locker	1
- Storage		
	Shelving unit (1 m)	2
- Dirty linen		
	Single bag, dirty linen trolley	1
Laundry		
Dirty linen reception and storage		
	Single bag, dirty linen trolley	1
Washing area		
	Pail, 12 litres	4
	Washtub, 65 litres	4
	Washing machine	1
	Drier	1
Drying area / ironing		
	Electric iron	2
	Ironing board	2
Sewing room		
	Sewing machine	2
Clean linen storage and distribution		
	Clean linen trolley	2
	Table, standard	2
	Shelving unit (1 m)	6
Central store	Cupboard	1
	File box	1
	Chair	1
	Steps 1,5 m	1
	Shelving unit (1 m)	2
	Table, standard	1
Mortuary		
	Metallic patient transfer stretcher	1
	Autopsy instrument set	1
Generator house		
	Generator ,with accessories	1

Set of glassware for Major Health Centre laboratory, including:

- 1 Set of 20 glass stirring rods - dia. 6/7 - length: 250 mm;
- 1 Boiling flask, flat bottom - 250 ml
- 1 Boiling flask, flat bottom - 500 ml
- 1 Boiling flask, flat bottom - 1000 ml
- 2 Glass beaker - 100 ml
- 2 Glass beaker - 250 ml
- 1 Glass beaker - 600 ml
- 1 Glass beaker - 1000 ml
- 5 Glass Petri dish dia. 100 mm
- 2 Sets of 100 plastic sterile Petri dishes - dia. 90 mm
- 1 Set of 5000 caps for haemolysis tubes
- 2 Brucelle forceps - 13 cm
- 1 Burette, glass, straight, with glass tap - 25 ml - 1/20
- 1 carded cotton roll, packed, 500 gr.
- 1 Red glass pen (set of 12)
- 1 Set of 100 sterile swab under plastic tube
- 1 Set of 1000 tips for micropipette, yellow, from 5 to 200 µl
- 1 Set of 1000 tips for micropipette, blue, from 200 to 1000 µl
- 1 Angled glass funnel - angle: 60° - dia. 55 mm
- 1 Glass measuring cylinder, graduated, 100 ml
- 1 Glass measuring cylinder, graduated, 250 ml
- 1 Glass measuring cylinder, graduated, 500 ml
- 1 Glass measuring cylinder, graduated, 1000 ml
- 1 Erlenmeyer graduated 100 ml
- 1 Erlenmeyer graduated 250 ml
- 1 Erlenmeyer graduated 500 ml
- 1 Erlenmeyer graduated 1000 ml
- 1 Precision glass flask 100 ml
- 1 Precision glass flask 250 ml
- 1 Precision glass flask 500 ml
- 1 Gloves, vinyl, non sterile, medium (box of 100)
- 1 Brush for cleaning test tubes
- 2 Slide for spreading 50 x 20 x 1,2 mm
- 2 Cover slides 22 x 22 mm (set of 100)
- 10 Cover slides optically planned
- 5 Slides 76 x 26 mm, 1-1,2 mm (Pack of 50)
- 1 Pasteur handle + loop
- 1 Micropipette adjustable volume, 5 to 50 µl
- 1 Micropipette adjustable volume, 50 to 200 µl
- 1 Micropipette adjustable volume, 200 to 1000 µl

- 1 Micropipette fixed volume, 20 µl
- 1 Micropipette fixed volume, 50 µl
- 5 packs 100 of paper filter for funnel, dia. 50 mm
- 1 Pack of 500 cleaning optical paper, 19 x 13,5 cm
- 1 Wooden Clamp for test tubes
- 1 Double clamp for burette
- 1 stainless steel clamp for beaker 100 to 1500 ml - length: 45 cm
- 1 Clamp for boiling and volumetric flask
- 2 Pipette, glass, graduated, 1 ml, 1/10 total deliver
- 2 Pipette, glass, graduated, 1 ml, 1/100 total deliver
- 2 Pipette, glass, graduated, 2 ml, 1/10 total deliver
- 2 Pipette, glass, graduated, 5 ml, 1/10 total deliver
- 2 Pipette, glass, graduated, 10 ml, 1/10 total deliver
- 2 Pipette, non-sterile, Pasteur, length: 150 mm (Set of 100)
- 2 Pipette, sterile, Pasteur, with cotton, length: 230 mm (Set of 100)
- 1 Plastic sterile graduated pipette, 5 ml, 1/10 (Set of 100)
- 2 Pipette Thoma for red blood cells
- 2 Pipette, blood diluting, Thoma, for white blood cells
- 1 Washing bottle with bent tube - 100 ml
- 1 Washing bottle with bent tube - 250 ml
- 1 Washing bottle with bent tube - 500 ml
- 1 Opaline plate for rhesuscope, 31 x 16 mm
- 1 Pipette filler with glass ball
- 2 Polyvinyl rack, 24 hemolysis tubes
- 2 PVC stands for 24 test tubes dia. 23 mm
- 1 Urine sampling flask, 60 ml (Set of 100)
- 1 Parafilm roll, 10 x 38 cm
- 1 Double spatula, length: 235-cm approx.
- 1 Pencil, diamond tip, for writing on glass
- 1 Stand for pipettes
- 1 Stand for burettes
- 1 Plastic stand for approx. 32 slides
- 1 Set of 100 glass test tubes, dia. 16 mm x length: 160 mm
- 5 Sets of 100 polystyrene hemolisis tubes, dia. 12 mm x length: 75 mm
- 2 Sets of 100 glass hemolisis tubes

Set of glassware for Minor Health Centre laboratory, including:

- 1 Set of 5 glass stirring rods - dia. 6/7 - length: 250 mm;
- 1 Burette, glass, straight, with glass tap - 25 ml - 1/20
- 1 Red glass pen (set of 12)
- 1 Glass measuring cylinder, graduated, 250 ml
- 1 Gloves, vinyl, non sterile, medium (box of 100)
- 1 Brush for cleaning test tubes
- 2 Slide for spreading 50 x 20 x 1,2 mm
- 5 Slides 76 x 26 mm, 1-1,2 mm (Pack of 50)
- 5 packs 100 of paper filter for funnel, dia. 50 mm
- 1 Pack of 500 cleaning optical paper, 19 x 13,5 cm
- 2 Pipette, glass, graduated, 1 ml, 1/10 total deliver
- 2 Pipette, glass, graduated, 2 ml, 1/10 total deliver
- 1 Urine sampling flask, 60 ml (Set of 100)
- 1 Double spatula, length: 235-cm approx.
- 1 Pencil, diamond tip, for writing on glass
- 1 Stand for pipettes
- 1 Plastic stand for approx. 32 slides

8.12 Annex D

ANNUAL ESTATE MAINTENANCE BUDGET

YEAR	BUDGET /ANNUM (in US$)
existing situation	708,000
Year 1	720,000
Year 2	746,536
Year 3	789,773
Year 4	884,064
Year 5	878,802
Year 6	1,027,145
Year 7	1,092,944
Year 8	1,131,368
Year 9	1,179,490
Year 10	1,269,963
From year 11 onwards	1,379,950

EXISTING SITUATION

Health Facility	Estimated real estate value (in U$)	rate	COST (in US$)
Dispensaries	1,200,000	4%	48,000
Minor Health Centres	1,900,000	4%	76,000
Major Health Centres	1,900,000	4%	76,000
Farafenni Hospital	5,900,000	4%	236,000
Bansang Hospital	1,800,000	4%	72,000
Royal Victoria Hospital	5,000,000	4%	200,000
TOTAL MAINTENANCE COST/ ANNUM			**708,000**

Maintenance cost of existing buildings @ 4% of the real estate value
Maintenance cost of new buildings @ 2% of the real estate value

8.13 Annex E:

NORMS AND STANDARDS

(MINIMUM REQUIREMENT)

BUILDINGS					
Element	**Reference.**	**Material**	**Size/spec**	**Decoration**	**Areas**
Sub-Structure	Spec. E	Reinforced concrete pads;	300mm thick		General
	Spec. E	Strip foundation	200mm thick		General
	Spec. E	Blockwall filled with lean mix concrete	200mm thick		General
	Spec. E	Ground bearing floor slab	150mm thick		General
Super-Structure	Spec. F10	Sand Cement Blockwall 2.0N/mm	200mm thick		General
	Spec. E	Reinforced concrete column (25N/mm2)	200x200mm		General
	Spec. E	Lintels (for opening up to 1.5m wide)	150mm bearing		General
	Spec. E	Lintels for opening 1.5-3m wide	200mm bearing		General
	Spec. G20	Timber stud partition made of 100x50 mm frame at 600x1200c/c	100mm thick		General
	Spec. Z11	Steel roof trusses with steel cleats	50x50x5mm angles or 50x2.5mm shs		General
	Spec. G20	Timber roof trusses with timber cleats	150x50mm timber		General
	Spec. Z11	Steel purlins	50x50mmx5mm angles		General
	Spec. G20	Timber purlins	100x50mm		General
	Spec. H31	Profiled aluzinc roof sheets	0.5mm thick		General
Windows	Spec. L1	Aluminium sliding	5mm clear glass	Self	General
	Spec. L1	Aluminium louvred carrier	6mm clear glass	Self	General
	Spec. Z11	Mild Steel burglar bars to windows	2mm thick shs or 4mm thick flat bar	Paint	Stores, offices
	Spec. L	Insect screen to windows	Glass fibre mesh	Self	General
Doors	Spec. L2	Half glazed steel door	Made of rolled H and I steel sections	Paint	Entrance/ Exit doors
	Spec. L2	Steel plated door	Made of rolled H and I steel sections	Paint	Security Stores
	Spec. L2	Louvred steel door	Made of rolled H	Paint	Stores/

			and I steel sections		Toilets
	Spec. L2	Solid core flush door & 150x50mm timber frame	44mm thick door leaf without vision panel	Paint	Internal doors
	Spec. L2	Solid core flush door & 150x50mm timber frame	44mm thick door leaf with vision panel	Paint	Internal doors
	Spec. L2	Louvred timber door & 150x 50mm timber frame	44mm thick door leaf with vision panel	Paint	Stores/ Cupboards
Floor Finish	Spec. M40	Anti static none slip vinyl sheet with seamed and welded joints	2mm thick sheets fixed to 40mm screed	Self	Theatres
	Spec. M40	Porcelain floor tiles	12mm thick laid on 40mm thick semi-dry screed	Self	Internal areas
	Spec. M40	Quarry floor tiles	12mm thick laid on 40mm semi dry screed	Self	Verandahs
	Spec. E	Basalt screed with trawel finish	40mm thick cast in-situ	Epoxy floor paint; one prime coat, one under coat and three finish coat	Stores
	Spec. E	Basalt screed with trawel finish	40mm thick cast in-situ	Ordinary floor paint; one prime coat, one under coat and three finish coat	Stores
	Spec. E	Basalt screed with trawel finish	40mm thick cast in-situ	Self	External walkways
	Spec. E	Basalt screed with exposed aggregates	40mm thick cast in-situ	Self finish	External walkways
Skirting	Spec. M40	Anti static none slip vinyl sheet with seamed and welded joints to match floor	2mm thick x 150mm high	Self finish	Theatre
	Spec. M40	Porcelain tiles	12mm thick x 150mm high	Self finish	Internal areas
	Spec. M40	Quarry floor tiles	12mm thick x 150mm high	Self finish	Verandahs
	Spec. M40	Render to walls (specified under walls)	Up to 150mm high	Epoxy floor paint	Store
	Spec. M40	Render to walls (specified under walls)	Up to 150mm high	Ordinary floor paint	General
	Spec. M40	Hard wood timber	15mm thick x 100mm high		Offices
Wall	Spec. M20	Sand cement render	19mm thick	Emulsion	External

Finish			applied in two layers	paint	walls
	Spec. M20	Sand cement render	19mm thick applied in two layers	Gloss paint up to 2.0m high	Verandahs/ walkways
	Spec. M20	Sand cement render	19mm thick applied in two layers	Matt oil base	Verandahs/ walkways
	Spec. M40	Sand cement render	19mm thick applied in two layers	Tyrolean	External finish
	Spec. M40	Sand cement render	12mm thick	Emulsion paint	Internal
	Spec. M40	Sand cement render	12mm thick	Gloss paint up to 2.0m high	Internal
	Spec. M40	Glazed ceramic wall tiles on blockwork/ concrete base	150mmx150x6mm thick up to 1800mm high	Self	To toilets/ showers and baths
	Spec. M40	Glazed ceramic splash-back on blockwork/ concrete base	150mmx150x6mm thick up to 1800mm high	Self	Over all sinks and wash basin
	Spec. M	Pb protection to walls	1mm thick up to 2100mm above FFL.	Paint on 4mm plywood lining	To Radiology Room
	Spec. M	Anti static none slip vinyl sheet with seamed and welded joints to match floor	2mm thick x 1500mm high	Self finish	Theatre
Ceiling Finish	Spec. M	Suspended ceiling	15mm thick Celotex on 600x600mm grid – flush jointing	White/Self	Theatre
	Spec. M	Suspended ceiling	Aluminium panels with push clip fixings	White/Self	General
	Spec. M	Profiled aluminium sheets	0.3 mm thick coated with PVF2	White/Self	General
	Spec. M	Celotex ceiling boards with 10x50mm timber battens	15mm thick sheets	Emulsion paint/white	General
	Spec. M	Plywood	6mm thick	Emulsion paint	General
	Spec. M	Plywood	6mm thick	Gloss paint	General
	Spec. M	Plywood	10mm thick	Emulsion paint	General
	Spec. M	Plywood	10mm thick	Gloss paint	General
	Spec. M	Hardboard ceiling	3mm thick	Emulsion paint	Stores
	Spec. M	Hardboard ceiling	3mm thick	Gloss paint	Stores
Plumbing &	Spec. R11	Waste disposal above FFL.	Pvc surface fixed with flexible joints		General

Drainage					
	Spec. R12	Waste disposal bellow FFL. And/or ground floor	Diameter 110x 3mm thick upvc with easy bends at all change of directions		General
	Spec. N13	Whb with pillar taps	½ inch	Chrome finish	General
	Spec. N13	Whb with elbow taps	½ inch	Chrome finish	General
	Spec. N13	Sluice sink with elbow taps	Stainless steel	Self	General
	Spec. N13	Scrub sink with elbow taps	Stainless steel	Self	General
	Spec. N13	Squat toilet	Vitreous china with 9litre cistern	White glazed	Toilet
	Spec. N13	Wc toilet	Vitreous china with 9litre cistern	White glazed	Toilet
	Spec. N13	Assist wc toilet	Vitreous china with 9litre cistern	White glazed	Toilet
	Spec. N13	Bath tub	Steel enamel	White glazed	Toilet
	Spec. N13	Assist bath	Steel enamel	White glazed	Toilet
	Spec. N13	Grab rail and other accessories	Stainless steel with Diameter 50mm	Self	Toilet
Electrics	Spec. V90	Pendant light fitting	300 or 600mm drop	Bayonet fitting	General
	Spec. V90	Single fluorescent light fitting	1200mm long		General
	Spec. V90	Twin fluorescent light fitting	1200mm long		General
	Spec. V90	Integrated light fitting to flush with ceiling.	600x600mm		Theatre
	Spec. V90	Water proof security light fitting	Optional low emergency bulb		External Light
	Spec. V90	Flood light fitting	500/1000W		External Light
	Spec. V90	Switches to lights			General
	Spec. V90	Single small power socket with switch	13 amp		General
	Spec. V90	Twin small power sockets with switch	13 amp		General
	Spec. V90	Ceiling fans and control	Control shall be a knob		General
	Spec. V90	Hole in the wall air conditioner & switch	Switch to have pilot light		General
	Spec. V90	Split A/C and switch	Switch to have pilot light		Theatre
	Spec. V90	Consumer control unit to each department / or building	Metal casing		General
	Spec. V90	Mains supply	Metal casing		General
	Spec. V90	Generator	As required		General

	Spec. V90	Underground cable	Armour and placed in a 110mm upvc duct		General
	Spec. V90	Supply distributor	Metal casing		General
Fittings and fixtures	Spec.	Shelves, etc.	See equip. schedules		
EXTERNAL WORKS					
Element	**Reference.**	**Material**	**Size/spec**	**Decoration**	**Areas**
Access road	Spec. E	Concrete on compacted laterite	150mm thick with brc laid in bays	self	General
	Spec.	Bitumen finish on compacted laterite	Two coats of bitumen spray with basalt chippings	self	General
Pavement	Spec. E	Paving slabs	400x400x 50mm thick paviors	self	General
	Spec. E	In-situ concrete	150mm thick	self	
Hard Landscape	Spec.	Cuckle shells on compacted laterite	As required		General
	Spec.	Basalt chippings on compacted laterite	As required		General
					General
Soft Landscape	Spec.	grass	As required		General
	Spec.	Flower / shrubs	As required		General
Storm Drains	Spec. E	Open drains	600mm wide made of 200mm thick solid walls on 150mm base		General
	Spec. E	Covered drains – with 80mm thick covers to pedestrian areas, 150mm thick to vehicular areas.	600mm wide made of 200mm thick solid walls on 150mm base		General
Waste Disposal	Spec. E/ F	Septic tank	Made of solid blocks 200mm thick on 200mm foundation. Slab cover made of 200 thick reinforced concrete		General
	Spec E/ F	Soak away	Made of solid 200mm thick blocks on 200 thick base. Slab cover made of 200 thick reinforced concrete.		General

Fence	Spec E/ F	None-Perforated blockwork made of 150mm thick blockwork on 200mm thick foundation	2mm high		Perimeter fence adjoining other property
	Spec E/ F	Ditto perforated blockwork	2mm high		Perimeter facing access road / Partition within centre
	Spec E/ F	Ditto non-perforated blockwork	1.5mm high		Partition within centre
	Spec E/ F	Ditto non-perforated blockwork on 150mm thick foundation	1.0mm high		Partition within centre
	Spec E/ F	Chain link	2.0mm high		Partition within centre
Water	Spec.	Water tank	Size to suit		General
	Spec.	Treatment plant	As required		General

8.14 Annex TOR

Terms of Reference

THE GAMBIA

PARTICIPATORY HEALTH, POPULATION AND NUTRITION

PROJECT

HEALTH MAPPING – NEED ASSESSEMENT AND

PREPARATION OF A NATIONAL MAINTENANCE STRATEGY

TERMS OF REFERENCE OF THE STUDY

Background:

In the context of the National Health Policy (NHP) 1994-2000, the Government of The Gambia (GOTG) has received a credit of $18.00 million from the International Development Agency (IDA) for the Participatory Health, Population and Nutrition Project (PHPNP) managed by the Department of State for Health, Social Welfare and Women's Affairs (DSH) with IDA (World Bank) support. The PHPNP aims at improving family health in rural Gambia and will help to substantially improve the delivery of reproductive health and other services by Government and non-governmental organizations at the village and divisional levels. In parallel, the GOTG has received an additional $9.5 million for the Health Services Development Project (HSDP) with AFDB support. Both projects will contribute to improving health infrastructure already largely developed under the IDA financed National Health Development Project (NHDP). The DSH will closely coordinate the AfDB and the IDA project for the realisation of the NHP objectives.

In 1996, with AfDB financing, the DSH out-contracted a Health sector Requirements Studies (HSRS) which, inter alia, estimated the cost of the rehabilitation and equipment of 50 pre-selected facilities, and made proposals for the rehabilitation of the existing maintenance system.

As part of its PHPNP preparation, the DSH and IDA reviewed the HSRS data and conclusions, and agreed to conduct additional analysis with a view to: (I) conduct a comprehensive needs assessment; (ii) finalize the civil-works component of the PHNP project in the context of this assessment and (iii) prepare a national maintenance strategy, in close coordination with AfDB.

Objectives / Outputs:

A. Planning / Needs Assessment

1. Health Mapping.

The Consultant will assist the Department of State for Health in defining a succinct Health-Map comprised of:

a) Health Mapping. Review with the DSH the current structure of the Health Pyramid with an aim to: (i) streamline the structure; (ii) define the normative catchment area (population to be served) for each level of the pyramid, including geographical accessibility criteria; (iii) review the necessity of maintaining as specific layer, the Minor Health Centre the role of which in the pyramid is presently unclear [9], and propose appropriate solutions; (iv) assess current hospital bed needs.

b) **Minimum Packages of Activities (MPA).** In close relation with the results of the Health Pyramid, review and propose to the DSH the specific MPAS to be delivered at each level of the structure (sub-dispensaries, dispensaries, Minor Health Centres, Major Health Centres and Hospitals). In particular, the Consultant should define with the DSH if the MPA for standard dispensaries should include in-patient services for: (I) limited surveillance of patients (less than 24 hours); and (ii) birth deliveries and limited mother surveillance (for 24-36 hours).

2 Standards and norms.

In accordance with the above mentioned reviewed MPA, the consultant will review/validate with the DSH the standard norms for all types of standard facilities (sub-dispensaries, dispensaries, minor and major health centres and hospitals). These norms include:

[9] The Minor Health centres are currently considered equivalent to Dispensaries, however, the level of investment currently planned for Minor Health Centres is largely over the level planned for Dispensaries.

a) Architectural specifications: Areas for each/all activities listed in the MPA; technical specifications for each area. Special attention should be given to the cold chain needs.

b) Equipment. Existing lists of equipment should be

reviewed and validated according to the reviewed MPA.

c) Staff. A standard minimum package skills and staff is to be defined for each standard type of facility, again in accordance with the MPA. The norm should identify the staff who need to be provided with staff-quarters in order to properly perform his/her health activities as well as other staff.

The established norms must comply with international standards and take into account the overall investment, staffing and maintenance costs and requirements in The Gambia for the health sector.

3. Needs assessment.

According to the results of (1) and (2), the Consultant will assist the DSH in defining the total facility needs on a country-wide basis, vis-a-vis the (new) DSH norms for adequate coverage of the population. These needs should be broken down by Region/Health Division/ Districts.

B. Technical design and specification

According to results provided by activities listed in A above, the Consultant will:

1. Review the standard drawings.

The standard drawings prepared through the HSRS study (for dispensaries, minor health centres and major health centres, staff quarters) will be revised in line with the new architectural specifications, and the consultant will prepare cost evaluations of the various types of facilities. An additional standard drawing will be designed for sub-dispensaries.

2. Review the standard lists of equipment.

c. Investment Program.

The Consultant will assist the DSH in preparing a DSH preliminary investment program, including PHPNP (IDA) and HSRP (AfDB) support, bearing in mind other intervention investments (past, present and planned) and projections of future public sector resources availability in the health sector, other donors and NGOs(to be provided by the (DHS). The program will cover all levels of facilities, and provide forecast for two periods -- 5 years and 10 years. In this respect, the Consultant will prepare options to be considered by the DSH. The investment program will cover the civil-works and the equipment of the facilities. The Consultant will:

a) recommend the number of Sub-dispensaries, Dispensaries, Minor Health Centres, Major Health Centres to be created / eliminated / upgraded / downgraded, in all regions.

b) suggest options for the distribution of the first phase program between IDA and AfDB according to the results of the last missions of the two donors.

c) cost the different options.

3. Implementation arrangements.

On the basis of C. (c) above, the consultant will assist the DSH in preparing the necessary implementation arrangements, particularly with GAMWORKS as a contract management agency for the IDA financed sub-program.

4. Procurement of works and goods.

The Consultant will assist the DSH in preparing "packages" of works and goods for the IDA financed program and will prepare correspondent bidding documents for this program.

D. Maintenance

1. Building Maintenance.

The Consultant will:

a. Identify and list the different maintenance works to be executed on a regular basis, at each level of the pyramid, in order to maintain the buildings in good condition of operation;

b. evaluate the cost of these regular works for each type of facilities (sub-dispensaries, dispensaries, Minor and major health centres and hospitals);

c. derive from (b) the annual maintenance budget to be provided;

d. Identify the appropriate level of decentralization for the financial management of the maintenance budget;

e. Identify the implementation arrangements to be set up in order to out-contract these works to the private sector.

2. Maintenance of Equipment.

The Consultant will:

a. list all needed maintenance activities and determine a clear delineation between: (1) activities related to day to day regular maintenance that must be limited to preventive maintenance of non-sophisticated equipment and will be executed by in-house qualified staff who also will be in charge of the regular monitoring of equipment status, and (ii) activities related to maintenance of sophisticated equipment to be out-contracted to suppliers and specialized firms;

b. evaluate the cost of both types of activities in each category of facility (sub-dispensary, dispensary, minor and major health centre and hospital), and estimate the maintenance budget;

c. propose: (a) implementation and procurement arrangements for out-contracted maintenance and (b) arrangements for preventive maintenance, equipment monitoring and training arrangements for local staff.

3. **Equipment replacement.**

The Consultant will:

a. determine the life span of the different categories of equipment;;

b. estimate, for each type of facility, the cost of regular replacement of equipment to be replaced once their life span is over;

c. estimate the budget to be provided for regular replacement of over-aged equipment.

4. **Maintenance of Vehicles.**

The Consultant will:

a. evaluate the cost of the maintenance of the vehicle fleet in each Division and at the central level, on the basis of acceptable standard maintenance unit costs;

b. assess the capacity of the private sector to ensure the maintenance of the vehicle fleet in the regions;

c. provide a cost -efficiency comparative analysis of (i) a reinforced public maintenance system as proposed in the HSRS and (ii) a maintenance system out-contracted to the private sector, as recommended by the IDA mission of June 1997.

Form and Number of Reports

The consultant s will work closely with the relevant Departments and units at the DSH (Central and Divisional). It is expected that the consultant will present his report in a GIS data base on CD Rom.

Competencies

The consultant will be organized as a team comprising:

- a health planner / health economist (with large international experience) – 5 Years
- an architect / physical planner – 5 Years
- transport planner – 5 Years
- an equipment specialist – 5 years

- a mechanical engineer – 5 years
- GIS expert – 5 Years

Estimated time

Around 8 person months.

Type of Procurement

It is recommended that this be QCBS.

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i