MANAGEMENT OF REVOLVING DRUG FUND: EXPERIENCE OF KHARTOUM STATE- SUDAN

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DEDICATION

❖ *To **my father** for his support*
and encouragement to see me successful in life.

❖ *To my wife, son, brothers and sisters:*
their continuous moral support
and caring love were always
inspiring me during this year

* * *

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Acronyms and Abbreviations

ARI	Acute Respiratory Tract Infection
BI	Bamako Initiative
CCC	Comprehensive Child Care
CEH	Children Emergency Hospital
CIF	Cost, Insurance and Freight
CMSPO	Central Medical Supplies Public Organisation
DoP	Department of Pharmacy
ECHO	The Supply of Equipment to Charity Hospitals Overseas (UK)
EMCP	Economic Medical Care Project
EPI	Expand Programme on Immunisation
GMP	Good Manufacturing Practice
GNP	Gross National Product
HFs	Health Facilities
HIS	Health Insurance Scheme
IDA	International Dispensary Association (Netherlands)
KCCCP	Khartoum Comprehensive Child Care Programme
KS	Khartoum State
LS	Sudanese Pounds
MoH	Ministry of Health
NCS	National Comprehensive Strategy
NDP	National Drug Policy
NGOs	Non Governmental Organisations
NLED	National List of Essential Drugs
ORS	Oral Rehydration Salts
PHC	Primary Health Care
PHFs	Provincial Health Funds
RDF	Revolving Drug Fund
SCF-UK	Save the Children Fund- United Kingdom
SNF	Sudan National Formulary
UK£	United Kingdom Pound
UNICEF	United Nations Children Fund
UNPOP	United Nations Population Division
US$	United State of America Dollar
WHO	World Health Organisation

Abstract:

Drugs are essential for preventive and curative health services. Significant demand, limited funds and high prices contribute to frequent shortages of drugs in many public health programmes. One method for financing drugs and other pharmaceutical supplies has been the establishment of Revolving Drug Funds (RDFs) in which, after an initial capital investment, drug supplies are replenished with monies collected from the sales of drugs.

In the Ministry of Health, Khartoum State- Sudan (MoH-KS), there is one such fund which differs from a simple health financing project in four important respects. Firstly, the system does not promote drug sales for co-financing purposes but aims at supporting the prescribers and to provide better medical care, and patients` access to the essential drugs at reasonable prices. Secondly, the project guarantees equal drug prices throughout the state regardless of the distance from the distribution centre. Thirdly, RDF sales of drugs are directly to the patients and it collects revenues through its cash collection system. Fourthly, the programme operates on sound business management principles with commitment to public health goals.

The context of this dissertation is to describe and evaluate the viability of the Revolving Drug Fund of MoH- KS.

It was concluded that, the RDF successfully met its objectives and the maintaining of the current progressive operational framework will guarantee future success on the RDF.

Key Words: Drug Finance, RDF , Procurement ,Cash Collection, Drug Availability, Currency Swap, Delivery, Supervision, User fee, Inflation.

Chapter 1 Introduction

1.1 Drug Financing in Developing Countries:

The financial crisis facing the developing countries is constraining economic growth and forcing governments both to rethink and to refocus their domestic programmes. This retrenchment has not only included the public sector but has hit the government health care investments particularly hard. The health sector is frequently a source of high government expenditure, one that contributes little to short-term economic performance or foreign exchange earnings. This, combined with high annual recurrent costs of health care services, has made the sector an easy target for hard pressed ministries of finance.

The revenues available for social expenditure in general, and health care in particular, are also constrained by the need to provide for other functions of government (including, in some cases relatively large military expenditure) and by the need in many developing countries to undertake measures of economic stabilisation and structural adjustment (Cichon & Gillion 1993). Budget cuts often lead to a disproportionate reduction in non-staff inputs, leaving medical professionals without sufficient drugs and equipment.

The provision of access to affordable and acceptable quality drugs is probably the most crucial element in implementing Primary Health Care (PHC). As a result many developing countries have made it principle to provide drugs free of charge based on social ideals, have no intention to collect costs and have often defrayed the expenses by drawing money out of the national treasury. Unfortunately, few countries have the resources to fully implement such a policy. Significant demand, limited funds and high drug prices contribute to frequent shortages. Thus, the cost of drugs becomes a scarcity of drugs and disillusionment. Health professionals were dispirited by trying to provide services without the resource they have been trained to use and the people were frustrated by receiving so much less than they were promised.

This situation has to some extent, been deflected towards the small, rapidly growing, but expensive private sector of health care, with a result shift of qualified personnel towards the private sector and the service of wealthier clients who can pay.

In developing countries, pharmaceuticals generally account for a more significant share of overall health expenditures than in developed countries (for which this share is about 15%). In several African countries, it is believed to exceed 50%. In developing countries, 50- 90% of the overall pharmaceuticals expenditures are privately financed, which is considerably higher than in developed countries (median is 34%) (Velasquez, et al 1998).

Principles of Drug Economic Strategy:

The main principles behind the economic strategy for drugs recommended by the World Health Organisation (WHO) are:

- the objective of various drug financing systems must be to improve and facilitate the access of the whole population to essential drugs;
- the responsibility and will of the state to participate in paying the national drug bill are fundamental;
- the money saved by the selection of drugs to circulate in the country and their rational use must be one of the main sources of additional income for the purchase of drugs;
- the allocation of an adequate percentage of the state budget to health, and consequently to drugs, must be a priority; for many countries this will require an increase in public spending for health.

1.2 Mechanisms of Drug Financing:

Financing of pharmaceutical is crucial issue for several reasons. First, because drugs are save lives and improve health, it is important that drug financing ensures access to essential drugs for all segments of the population. Second, drugs are costly. For most ministries of health, drugs represent the largest expenditure after staff salaries. In some countries, up to 80% of household's health-related spending is on drugs. In developing countries, drugs commonly represent from 25 to 50% of total public and private health

expenditures (Quick, et al 1997). Third, inadequate funding for drugs means that expenditures for staff salaries and other care costs may be used inefficiently or simply wasted. Fourth, the availability and effectiveness of drugs are key factors in generating and maintaining public interest and participation in health related activities.

Possible drug financing options include public financing; user charges; private or co-operative not-for-profit; donors and international loans. Nevertheless, it is the responsibility of government to ensure that drug-financing mechanisms are managed in such away as to achieve universal access to essential drugs. Those various methods of drug financing can be classified into two main categories: free of charge and cost-sharing mechanisms.

1.2.1 Free of charge mechanisms:

The distribution of drugs free of charge is the only possible solution when the population to be served has no financial resources; examples are persons who are displaced, in refugee camps and poor rural areas. This can be via:

a) Public financing through general revenues:

Governments in virtually every country in the world play a role in financing health services and pharmaceuticals. This role reflects in part the recognition by society that health is a fundamental right to which all sections of the population should have access. It also reflects the realisation that the private sector does not necessarily achieve equity nor sustains the precept of solidarity.

Though some public financing for health and essential drugs are necessary, the level of financing varies dramatically among countries.

Health generally receives less than half the share of government expenditures in developing countries (1.6 to 7%) than it does in the established market economies (12.5%). Within the health sectors, the share of the budget devoted drugs varies from 4 to 5% in Chad (less than US$ 0.5. per capita) and 5.6% in Thailand, to 20% in Viet Nam and 36.1% in Zimbabwe (US$ 4.49 per capita) (Velasquez, et al 1998). The WHO

has suggested a minimum figure of US$ 1.00 per capita annually as an appropriate target for public expenditure for drugs. Public financing of free drugs may be through national or local government general revenues, taxes, loans and donation.

b) NGOs, donors and others:

The percentage of aid, which contributes to health expenditure, varies considerably from country to county. In Sub-Saharan Africa, the average contribution of aid is nearly 30%, whereas in Asia (excluding China and India) it is 11% and in Latin America it is under 8% (Velasquez, et al 1998). In pharmaceuticals, donors may support the establishment of drug supply systems and drug donations. The latter is frequently related to emergency relief or initial seeding of revolving drug funds. The external financing must not allowed to substitute for the effort of the countries to develop sustainable financing mechanisms.

Other mechanisms of drug financing such as employer-provided health care, which can be furnished either directly, through contracts with private providers or through insurance and reimbursement. This can also contribute to the overall health provision in a country.

1.2.2 Cost- Sharing mechanisms:

Drugs and other pharmaceuticals are essential for preventive and therapeutic health care and offer simple, cost effective solution to many health problems, provided, they are available, affordable and properly used. In addition to their direct health impact, the effectiveness of drugs against many common diseases serves to establish the credibility of health professionals that they need to promote long-term health improvements through environmental and nutritional changes. The importance and popularity of drugs has led many governments in developing countries to espouse policy of free drugs. However, because of the poor economic situation, the high international debt and the fall in the world prices of their commodities most developing countries are unable to continue with free provision of free health services and drugs at the point of delivery. Most governments have found themselves unable to maintain a continuous supply of drugs, which have up till now accounted for over 40% of the annual budget of most

ministries of health in developing countries. The introduction of cost sharing through user fees has been proposed as one of the strategies to lighten the physical burden of most governments, preserve the sustainability of the drug distribution system as well as to improve the efficiency of the overall public health sector. Cost-sharing is the drug financing programme that is sustainable with contribution from both public sector as well as community (through user fees). Facing shortage of drug supplies for PHC in many developing countries, it was recommended by the World Bank in 1987 (Griffin 1995) that some mechanisms of user charges should be implemented in the community and the money recovered should be used for the replenishment of drug supplies in that community.

To be successful, user fee mechanisms must generally be accompanied by perceived quality improvements in services. The World Bank suggests that the improvement in the quality of services would compensate the negative impact of prices. This implies that improved supply mechanisms for drugs are both prerequisites and outputs of successful programmes. The properly designed cost recovery programmes can encourage higher demand for modern health care and, as a result, higher level of utilisation (Hotchkiss 1998)

Community cost sharing mechanism can be based on direct sales of drugs through the Revolving Drug Fund, payment of a flat rate charge, prepayment for services via insurance and other various income generating activities.

1.2.2.1 Objectives of Cost-Sharing mechanisms:

- promote efficiency: user charges can move the patients from the big hospitals to the lower level of health facilities, through different drug prices at different levels of health care;
- foster equity: by charging people who are able to pay, more money will be made available for the poor through effective exemption systems;
- promote decentralisation and sustainability: cost sharing provides ways and means for decentralisation of health policy to community level;
- foster private sector to be more competitive in providing drugs and service;

- promote consumer satisfaction: the ultimate result of cost sharing should be increased consumer satisfaction following the availability of drugs;
- generate revenues: this can be a means to generate more revenues for facilities to buy new drugs;
- reduction of unnecessary utilisation: user charges for publicly provided health services and drugs can lead to more efficiency than the health services and drugs provided free of charge.

A key issue for government officials responsible for health care financing policy in developing countries is that of how to implement cost recovery plans without adversely affecting health outcomes through decreased health care utilisation. Whether individuals benefit from cost recovery plans depends on the quality of services that are delivered, the out-of-pocket price that is charged, and how individuals respond to that quality and price. In addition, the long-term financial viability of government investments in health care services depends on the ability to finance future improvements in quality by increasing revenues through higher user fees.

1.2.2.2: Direct sales through Revolving Drug Funds:

Payments for drugs has been seen as one component of the strategy of cost sharing, but has also been seen that when this is implemented most patients, especially the poor, are unable to afford drugs at market costs. One way, proposed to help this group of patients is through the introduction of a Revolving Drug Fund (RDF) in which after an initial capital investment, drug supplies are replenished using money collected from the sales of drugs.

The World Bank (1994) defines the term Revolving Drug Fund as community financing for the availability of essential drugs at full cost prices. RDFs, which are one type of drug sales programme or cost recovery schemes, attempt to mobilise financial resources based on a domestic willingness of people to pay for health services. RDFs are attractive, because they are theoretically self-financing after a one-time capital investment by the community, the government, out side donors or loans. The one-time initial investment could be either in medicines or in cash. In the latter case, cash is spent

to purchase medicines for initial drug stock. In purchasing medicines, medicines should be chosen from among essential drugs, meaning medicines of high necessity from a medical perspective, and medicines, which can be purchased at low cost because the patent on them has expired. RDF seeks to recover drug costs in part (long-term subsidies required), in full or with marginal profit on the cost of drugs, that allows the target group to buy the drugs and allows more drugs to be bought by the fund. As illustrated in Figure 1.1, the supply of drugs can be continued indefinitely without further government budget allocations as long as revenues from sales (or in some cases local health budgets) are sufficient and funnelled back in purchasing new drugs (Fig. 1.1).

Reasons usually given for establishing an RDF are: essential drugs are a critical component of effective curative and preventive health care; the increased availability of drugs is perceived as a real improvement in the quality of health care; drugs are tangible, and most patients are willing to pay for them; the public spends significant amounts of money for pharmaceuticals from the private sector, often buying inadequate quantities at high prices. Drugs supplied through a RDF are generally more affordable; and patients may attach greater value to drugs for which they have paid. A potential result is improved patient adherence to treatment; RDFs offer the potential for increasing the efficiency of drug services as well as generating additional revenues. Also, increased price awareness by prescribers and patients may result in improved use of drugs.

In comparison to public free drug programmes, RDFs make use of an untapped financial resource: patients` payment for drugs. The result of this can be a significant increase in the availability of drugs and a corresponding increase in community participation in public health care services. In addition the RDF provides a set of incentives to the population to use drugs more cost effectively. The cost recovery objectives of RDFs also force improvements in management of information and accounting systems, in inventory control, and in other supply management activities.

In comparison to commercial drug stores, RDFs have several potential advantages. Through the selection of the most cost-effective drugs, alternatives and competitive

bulk procurement by generic name, cash and foreign exchange outlays can be used more effectively.

The expected effects of the RDF are: residents would have better access to medicines, the RDF could serve as a channel to stabilise the drug supply at health facilities; improve the utilisation rates of health facilities and make retail prices, prescription activities and the direction to use medicines appropriate in places where there are many private pharmacies.

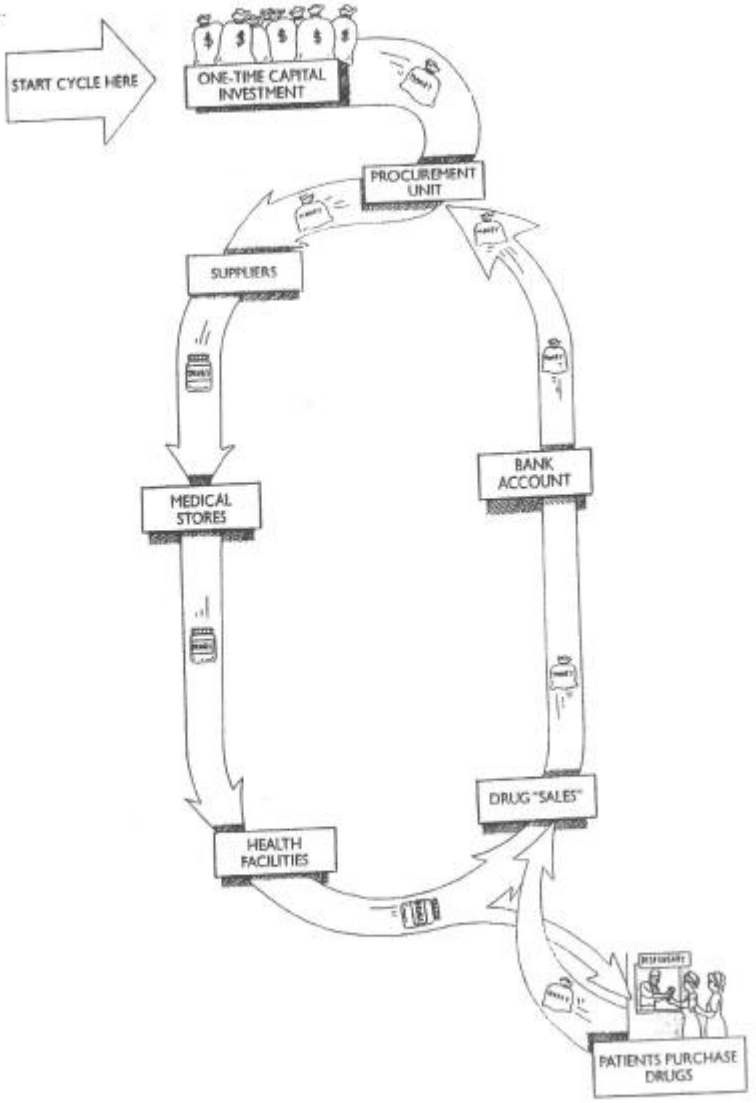
Revolving Drug Funds draw attention among health sector financing in developing countries as leading methods of community financing. They offer an appealing and potentially successful means of supplying drugs for many parts of the third world. The concept seems quite simple, but in practice these funds have proven to be substantially more complicated to plan and implement than systems which simply have given drugs away.

In the Ministry of Health, Khartoum State (Sudan), there is one such fund. This fund uses its own revenues to procure more affordable drugs. The Khartoum State RDF started with the technical and financial support of Save the Children Fund (United Kingdom).

1.2.2.3 Payment of flat rate charge:

A flat rate charge covers both health care and drugs. The amount may vary according to the level of service (dispensary, health centre or hospital) or the condition treated (such as malaria or childbirth). The example of this type of cost sharing is the Bamako Initiative (BI). This was announced at a meeting of African ministers of health in 1987 in Bamako, the capital of Mali, as a response to the severe problems in financing health services in Sub-Saharan Africa. The goal of the BI is the universal accessibility to PHC. BI advocated PHC as well as maternal and child health care financed through community financing. Drugs are sold at prices that cover their cost and make surplus to cover recurrent cost. Based on this proposal, UNICEF backed many experimental RDFs in the region by giving seeding stock. In Benin and Guinea the BI programmes

Figure 1. 1: RDF Cycle
Source: Managing Drug Supply (1997) 2nd edition



have demonstrated their ability to raise preventive and curative coverage with key PHC intervention while keeping the cost of the health system low (Soucat, et al 1997).

1.2.2.4 Prepayment:

Prepayment (health insurance) separates in time the act of payment from the act of consumption, so people who are well and not patients (Jerome 1998) pay for those drugs. The fundamental concept behind health insurance is the sharing of the risk and burden of paying for illness among a group of people or society. There are different insurance approaches, which can involve both the public and private sectors such as social health insurance, community prepaid schemes and private health insurance.

1.2.3 The Role of the Community in Cost-Sharing:

Community financing is put forward primarily as a method of providing additional resources to the health sectors. In addition, it is sometimes argued that community financing is a form of community participation, which ensures that communities are not just passive recipients of services. The scope of community financing to generate additional resources for the health sector depends on the potential to find a combination of prices (user charge or premia) and quality improvement which proves both affordable for the population, capable of attracting its willingness to pay and capable of sustaining activities given a realistic assessment of government or donor support.

1.3 Aims and Objectives:

Khartoum State –Ministry of Health (KS-MoH), under its obligation to provide medical services to the entire population of the state, relies on the RDF to make available at the MoH health facilities (Hospitals, health centres and dispensaries and people's pharmacies) safe, effective, good quality essential drugs in sufficient quantities at affordable cost to the individuals and to ensure equity and accessibility to them.

This dissertation aims to outline the process by which a RDF was successfully implemented in KS-MoH.

The main objectives are as follows:

- To trace the historical development of the RDF and to assess the progress made and the sustainability of the project;
- To describe the current situation, to build upon the problems encountered and to set recommendations;
- To assess the role played by the community in the implementation of the Revolving Drug Fund and the achievement of its objectives;
- To extract the main principles involved in the successful implementation of the RDF in Khartoum State for the information of other states and Non Governmental Organisations wishing to implement such a programme.

Chapter 2 Country Profile

2.1 Physical Feature and Location:

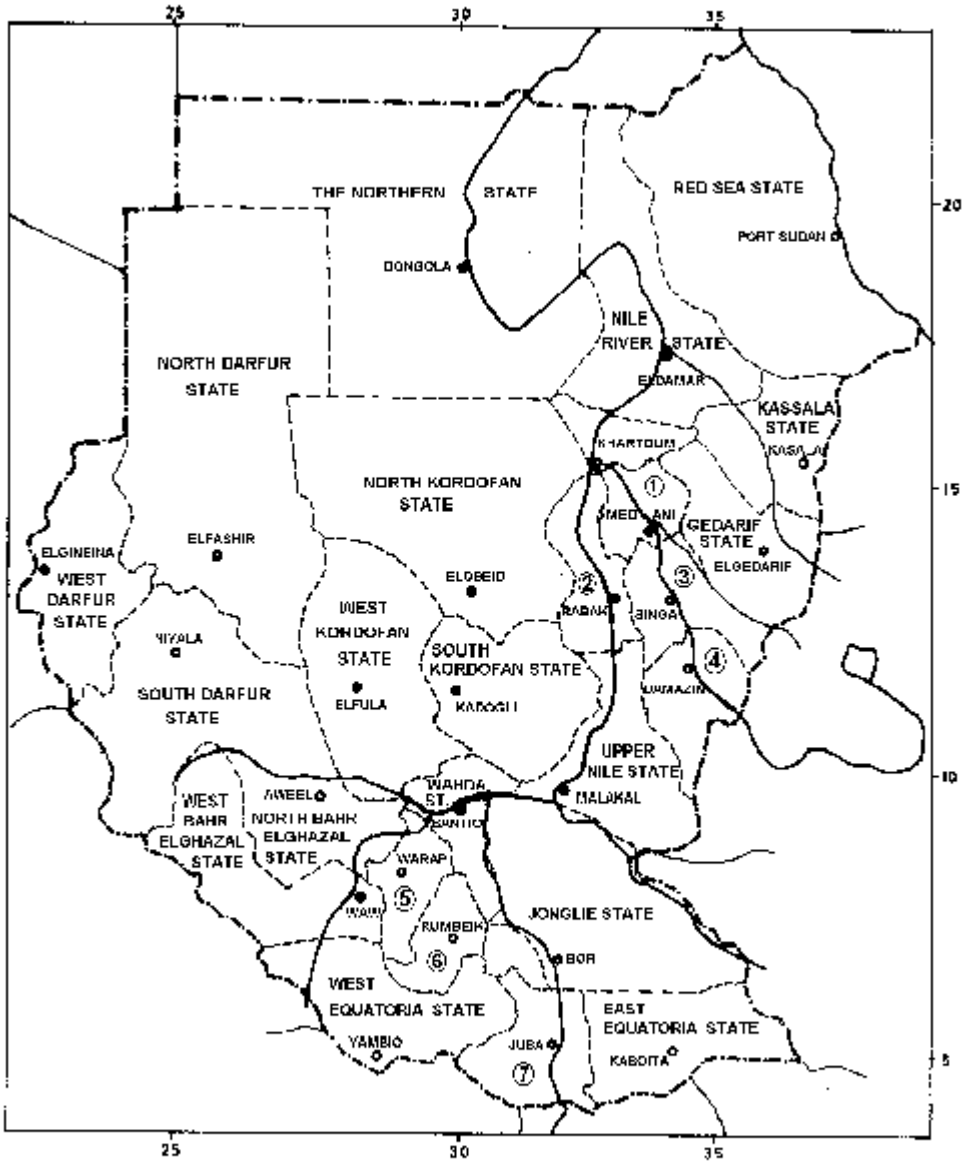
With an area of 967,481 Square miles (2,505,810 Sq. Kilometres), the Sudan occupies 1.7% of the world's land surface and is roughly near the size of Europe. Sudan is the largest country in Africa and shares frontiers with 9 countries: starting from Egypt in the north, and then clockwise, are the Red Sea, Eritrea, Ethiopia, Kenya, Uganda, Congo, the Central Africa, Chad and Libya. It extends 1,100 miles from longitude 21.75^{o} near Elgeneina on the Chad boarder East to 38.50^{o} East at the Red Sea coast near Toker (the Eritrian frontier) and stretches some 1,300 miles from Numule on the borders with Uganda at latitude 3.50^{o} North to Bir Shalatin on the Red Sea at 23.00^{0} North (Fig. 2.1).

The Sudan is divided into three distinct regions:
The North area, comprises about 30% of the country, consists of the stony Nubian desert lying to the east of the River Nile and the sandy Libyan desert to the west. The River Nile cuts through these desert lands, and in many places the arid desert landscape reaches right up to its banks.

The central region consists of steppes and low mountain. Near the city of Khartoum (the national capital of the Sudan), the two main tributaries of the River Nile, known as the Blue and White Niles, converge. The Blue Nile rises from Lake Tana in Ethiopia and flows across east central Sudan. The much longer White Nile has its origin at Lake Victoria on the border with Kenya, Uganda and Tanzania.

The southern region contains vast swamps and rain forests. On its journey through this region on the way to Khartoum, the White Nile loses about 60 % of its water through evaporation.

Figure 2.1: **SUDAN STATES**



2.2 Climate:

Un-nerving heat and the steady progress of climatic change from South to North are the dominant features of the Sudanese climate. In the Northern frontier region, conditions are Saharan: very hot and dry weather, with almost no rainfall, maximum temperature is 43.30^{o} C (110^{o} F) in summer and lowest temperature in winter can be as low as 4.40^{o} C (40^{o} F), particularly at night. On the other hand, rainfall in the extreme South is equatorial. Between these two regions, rainfall and humidity decreases from South to North.

2.3 Population:

At the beginning of the last century, two millions people lived in Sudan. By 1999 there were 34 million with a population growth rate of 2.87%. Two third of the population are women and children. 75% of the population live in the rural area, divided to 66.5% settled rural and 8.5% is nomads (the economic review 1996). From the last census (1993) it appears that the population aged between 0-15 years is 45% of the population and this increases the need for essential services such as health and education.
Sudan is an ethnically and culturally diverse country of around 597 tribes. The main language is Arabic, but numerous local dialects are also spoken.

2.4 Political and Administration System:

Sudan gained independence from British colonisation in January 1956. Since independence Sudan has been ruled by a series of unstable parliamentary governments and military regimes. The current government started as a military government in 1989 and dissolved in the civil government in 1992. The political instability and civil war in the south have had their negative impact on the soscioeconomic and development of the country.

Under a decentralisation programme completed in 1994, the Sudan is divided into 26 states, each state (Wilaya) is administered by an autonomous government composed of

a ministry of health and other 4 ministries chaired by Wali (governor) of state. The state is divided into provinces which, in turn is divided into the localities.

The federal government exercises its power over the whole of the Sudan, and State governments exercise the powers granted to them by federal law, with both exercising power over: the civil service, public legal advisors and attorneys, organising inter state information, culture and publishing, local government, media culture and publication, education and scientific research, health, social welfare economic policies, co-operation, industry, queries and border trade (Sudan constitution 1998).

2.5 Economy:

The state directs the growth of the national economy by planning on the basis of work, production and the free market to prevent monopoly, usury, cheating and to ensure national self sufficiency, abundance, blessing and aims of justice among state and regions (Sudan constitution 1998).

Sudan is buffeted by civil war, chronic political instability, high inflation, a drop in remittances from abroad and counterproductive economic policies. The private sector main areas of activity are agriculture and trading, with most private industrial investment. Agriculture employs more than 80% of the work force and contributes to 95% of the exports with about 48% of the GNP (World Bank 1999). Sluggish economic performance during the 1980`s, attributable largely to a declining annual rainfall, has kept per capita income at a low level. In 1998, a top priority was given to develop potentially lucrative oil fields in the south central Sudan; the government is working with foreign partners to exploit the oil sector. Most recently, Sudan has benefited from a private investment in oil production, which is expected to reduce the country’s import bill and improve the availability of foreign exchange for development financing. The oil exportation started in July 1999.

2.6 Health System:

2.6.1 Introduction

The present policy of the national health care system of Sudan is based upon ensuring the welfare of the Sudanese population through increasing national production and upgrading the productivity of individuals.

Based on the principles of the National Comprehensive Strategy (NCS 1992-2002), a health development strategy has been formulated in a way that realises the relevancy of health objectives to the main goals of the national development plans. It is the policy of the federal Ministry of Health (MoH) to give priority to generalising and developing the Primary Health Care (PHC) services in the rural areas as well as urban areas .The current health care system is based on the characteristics of a PHC as determined by the Alma-Ata in 1978. These are: education concerning prevailing health problems and the methods of preventing and controlling them; promotion of food supply and proper nutrition; an adequate supply of safe water and basic sanitation; maternal and child health care; immunisation against major infectious diseases; prevention and control of locally endemic diseases and provision of essential drugs. This achieved through a health system consisting of three levels (state, provincial level and localities), includes the referral system to secondary and tertiary levels. 2205 physicians among them 554 specialists, 107 medical registrars and 1544 medical officers, 156 dentists, and 206 pharmacists (1996) provide the public health services.

Table 2.1: illustrates some statistics and health indicators of Sudan

Indicators	Year	Estimate	Source
GNP per Capita (US$)	1999	290	UNICEF
Crude Birth Rate (births per 1,000 pop.)	1996	34	UNPOP
Crude Death Rate (deaths per 1,000 pop.)	1996	12	UNPOP
Maternal Mortality Rate(per 100,000 live births)	1990	660	WHO/UNICEF
Life Expectancy at Birth	1996	54	UNPOP
Infant Mortality Rate (per 1,000 live births)	1999	73	UNICEF
Under Five Mortality Rat (per 1,000 live births)	1999	115	UNICEF
% Population Access to Safe Water	1999	73	UNICEF
% Population Access to Adequate Sanitation	1999	51	UNICEF
% Population Access to Health Services	1985-1993	51	UNICEF
Infant Mortality Rate Under One (per 1,000)	1993	27	UNICEF
Annual number of Under Five Deaths(Thousands)	1999	107	UNICEF

2.6.2 Health financing

The Government of Sudan has provided free medical services to its citizens including the free supply of drugs, funded by general resources since independence in 1956. However, it seems that the inequity in the distribution of resources, with input into expensive modern technologies which serve the few, continues to grow, while simple cost interventions to prevent diseases in the community, especially in the far states are underfunded, including drugs. In addition, due to increased population and limited allocation of funds for drugs within total health budget, the drugs are rarely found in public health facilities since the late 1980s.

In 1991, the federal MoH introduced an Economic Medical Care Project, which is a community Cost-Sharing mechanism for contribution in financing medical care and drugs in all health facilities.

2.7 Brief profile of Khartoum State- Sudan:

2.7.1 Introduction:

Khartoum State (KS), comprises the national capital of Sudan which was created in 1992 with an area of 28000 Square Kilometres. It is bounded by Northern and the River Nile states in the North, Gazira and White Nile states in the South, Kasala and Gadarif in the East and Kurdufan North in the West. KS is administratively divided into 7 provinces, which are in turn divided into 36 localities.

2.7.2 Population:

The Khartoum State population is 4,568,177 as estimated from the 1993 census with growth rate of 4.04% per year (health statistic report 1999). The population is a mixture of all-Sudanese tribes and ethnic groups. The religion is Islam with minorities of Christianity and traditional worshipping of God’s especially among displaced peoples. 68% of the population are urban, 21% in rural areas and 11% are displaced people.

2.7.3 Geography:

The topography is mainly plain lands. The River Nile and its tributaries divide it into three main cities: Khartoum, lies between Blue and White Niles, Omdurman lies on the West of the River Nile and Khartoum north on the East of the Blue Nile. KS has two main climatic seasons, the dry hot and cold seasons with an intervening wet season from July to September. The maximum temperature is 43^{o}C in summer and minimum temperature is 15^{o}C in the winter.

2.7.4 Health status :

The health status of Khartoum State does not differ substantially from that found in the rest of Sudan. The major health problems are tropical diseases and many of them diseases of environmental health. At the top of the list is malaria (27% of the patients) which is endemic in the South and central parts of the country. Malaria is a major cause of death in children under the age of five years, ranking above acute respiratory tract infections (ARI), diarrhoea diseases and the Expanded Program on Immunisation (EPI). EPI diseases: measles, tetanus, poliomyelitis, whooping cough, diphtheria and tuberculosis.

The health situation has improved in the past decade, due to the political high commitment to primary health care and environmental control, the training of more modern health care personnel, the introduction of a Revolving Drug Fund as well as a Health Insurance Scheme.

2.7.5 Khartoum State Ministry of Health:

2.7.5.1 Introduction:

Since it was established in 1992, the Ministry of Health- Khartoum State (MoH-KS) is responsible for health services in KS. It works in co-operation with other ministries of finance, education, information and social affairs, economic planning and agriculture to be able to carry out its function effectively. The ministry is headed by a minister who is

a political appointee. The minister, the director general and his directors representing various technical departments and heads of projects constitute the highest ruling body in the ministry. The MoH has seven directorates and three main projects (Fig. 2.2) as follows:

1. Directorate of curative medicine;
2. Directorate of primary health care;
3. Directorate of preventive medicine;
4. Directorate of pharmacy;
5. Directorate of health planning ;
6. Directorate of health services;
7. Directorate of administrative and financial affairs.

The current projects are:

1. Revolving Drug Fund;
2. Economic Medical Care Project;
3. Health Insurance Scheme.

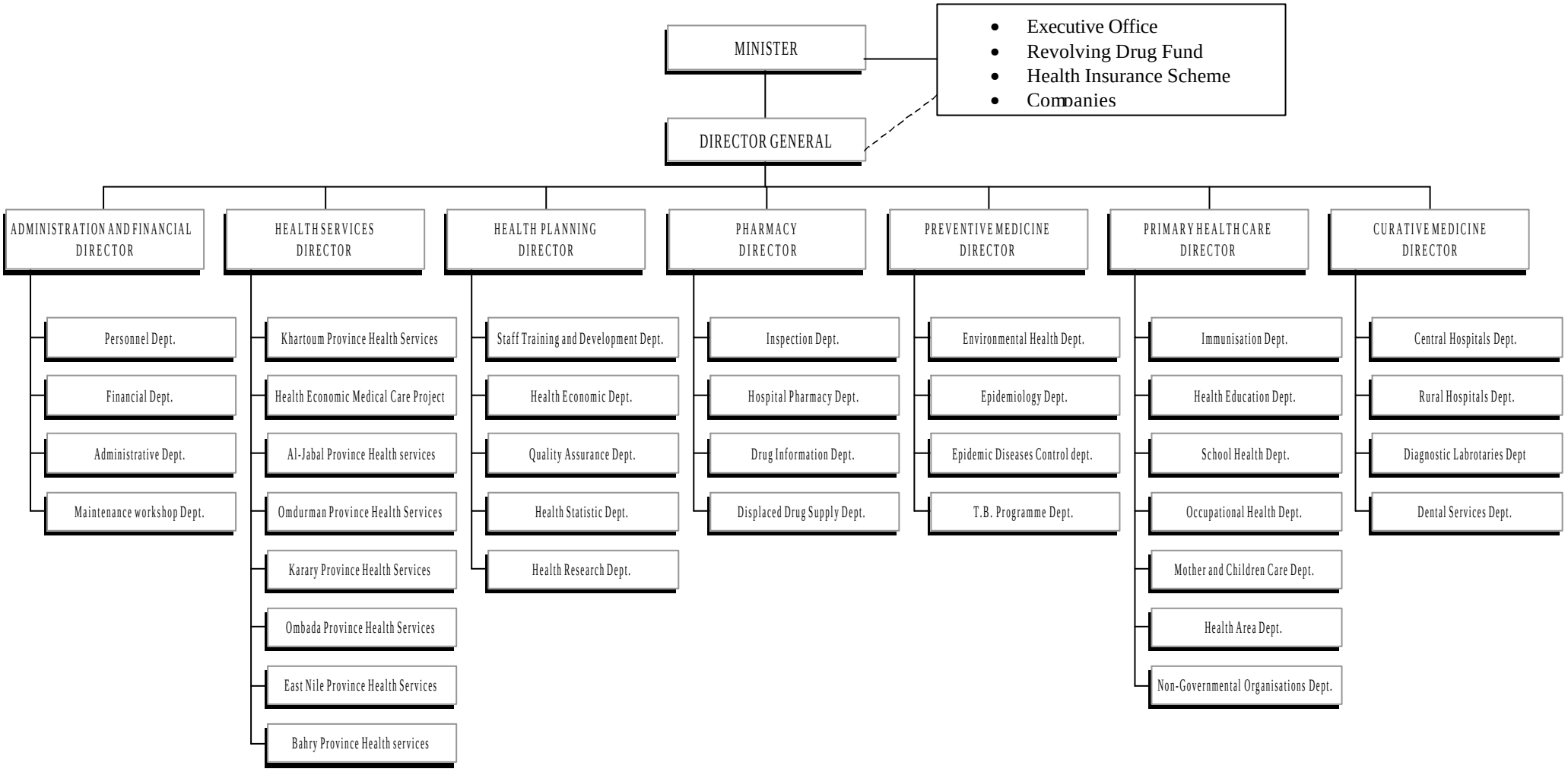
The Sudan constitution (1998) has supported and shifted almost completely the execution and implementation of promotional, preventive and curative activities to the state Ministries of Health. Within the state, the environmental health services and dispensaries (lower PHC units) became under the direct responsibility of localities, thus, near to the beneficiaries.

2.7.5.2 Health strategy:

The KS is in line with the National Comprehensive Strategy, whose goals are to bring about a comprehensive health system based on Primary Health Care (PHC) that is, protective, promotive, restorative and rehabilitative to every Sudanese within the available resources.

In the Sudan in general and in KS in particular, the government has committed itself to the attainment of the WHO notion: health for all and the PHC was chosen as the best way of achieving that goal, with especial emphasis on immunisation, nutrition, education and mother and child care. All health facilities provide a mix of primary health care services. These services include:

Figure 2.2: ORGANISATIONAL STRUCTURE MoH-KS



Source: Ministry of health Khartoum State 1998 Annual Plan

- General curative services for the common diseases and ailments(include ARI, and diarrhoea diseases management);
- Immunisation against the six immunisable childhood diseases, these diseases are: measles, tetanus, poliomyelitis, whooping cough, diphtheria and tuberculosis;
- Immunisation of pregnant mothers against tetanus;
- Growth monitoring and nutritional education;
- Antenatal care services;
- Family planning services;
- Health education.

These are the common components of PHC that is achieved through 171 dispensaries and 108 health centres. The referral system consists of 42 hospitals with a total number of 5175 beds as shown in table 2.2. KS has public (federal and state level), private and NGOs health facilities distributed throughout the state. The public health facilities range from high-specialised centres and university teaching hospitals, to rural hospitals, health centres and dispensaries.

In addition to the public health facilities, private sector and NGOs play an important role in the health system in KS. There are 43 private hospitals specialised in one or more medical disciplines i.e. surgery, medicine, gynaecology…etc., 1200 private doctors` clinics and 202 NGOs` primary health care units.

The health services in KS public sector are provided by 1066 medical doctors, among them 404 specialists, 209 medical registrars and 702 medical officers, 113 dentists, 181 pharmacists, 117 assistant pharmacists and 3765 nurses (health statistic report 1999).

Table 2.2: shows health facilities and number of beds in KS.

Health institutes	Number of institute	total beds
General hospitals	15	3605
Specialised hospitals	17	1570
Special medical and diagnostic centres	3	-
Dental centres	3	-
Health centres	108	-
Dispensaries	171	-
Total public health facilities	317	5175
Private hospitals	43	90
NGOs PHC units	202	-
Grand total	562	5265

2.7.5.3 Health area policy:

The health area policy was widely announced amongst policy makers and health professionals and it can be said its implementation is in progress. This policy is an attempt to decentralise the health service management, effect more integration and better utilisation of services and resources within a manageable defined area. It is also thought to assure and secure equity in accessibility to the health services and to increase the community participation and involvement in health care.

2.7.5.4 Economic Medical Care Project (EMCP):

The austerity measures imposed by the international climate of the 1980s, resulted in severe fiscal deficits in developing countries. This lead health care officials in these countries to re-examine their health service development policies (Haddad and Fournier 1995) and adopting strategies like recovery of recurrent costs of public health services through user fees such as the Bamako Initiative (BI). Health services without a minimum operating budget and a modicum of material inputs, especially drugs, are both economically inefficient and unattractive to the population. It is, thus, no surprise that the utilisation of Sudan health services in the public sector was low during the 1980s and the personnel especially in peripheral health facilities are idle most of the time. In 1991, the Sudan introduced cost recovery measures as a part of its programme of economic reforms, following a course taken by many developing countries.

The Economic Medical Care Project is the fee for service system in the public health centres of KS launched in 1991 by the Higher Committee for Health Salvation. This project aims to improve public health system performance despite their former decline due to inefficient management and the economic crisis. In KS EMCP revitalised the existing health centres in order to improve the effectiveness and efficiency of health services while ensuring sustainability and establishing equity mechanisms.

a) The objectives of EMCP:

The objectives of EMCP are to:

- Recover non-salary recurrent costs of health services in KS public health centres without decrease in utilisation of health services;
- Enhance service quality by encouraging medical doctors and other staff to work at health centres, by giving incentives in a form of extra allowances, training and promotion and by supporting supervision;
- Up-grade existing health centres with physical refurbishment and provision of medical and laboratory equipment, and increase the coverage by constructing new health centres in needed area;
- Engender the community participation in the management of health services;
- Make essential drugs available by introducing the Revolving Drug Fund in all project health facilities.

b) Health centre staff:

The EMCP health centres staff are: a medical doctor in most of them; dentist in the urban ones; assistant pharmacist; laboratory technician or assistant; 3 to 6 nurses; health visitor; midwife; nutritionist and other staff such as cashier at reception desk and in the pharmacy, statistic register, nightwatch and cleaner. In all health centres there are three medical assistants specialising in medicine, ophthalmology or dentistry.

c) Health services at health centres:

Through a building renovation programme, most of the older centres have gradually been refurbished and new ones have been built and well equipped by user fee revenues and financial participation of the community. These health centres offer curative and preventive services. The preventive services provided by health centres include most of the elements necessary for improving child health, e.g. immunisation, growth monitoring, nutritional education, Oral Rehydration Salts (ORS) sachets and antenatal care services and mother health services such as immunisation of pregnant mothers against tetanus, contraceptive pills and ferrous and folic acid tablets.

The curative services include general services for common diseases and wound dressing. All curative services must be paid for. The fees paid by users are: medical consultations fee; diagnostic fee; wound dressing and minor surgical procedure fee and dental fee. Other forms of payment in the health facilities include drug cost and fee for surgical operation and admission in hospitals.

There are mechanisms to support and protect the poor and especial groups such as orphans, martyrs families and school children via Zakat* and solidarity fund. However, the procedures of these systems are lengthy, bureaucratic and not well understood by beneficiaries.

c) EMCP Achievements:

The net results of EMCP are that a portion of the cost of health services is borne by users and waste is reduced. In addition to generating revenues, the quality of available health facilities` care has been improved and health services coverage has been expanded.

The option of higher quality care at a minimum fees – there is no comparison between relatively low fees (Sud. £ 2000) paid to the public health facilities and those higher fees (Sud. £ 15000) paid for the same service in private health facilities (Fundfunda1998) –is both popular and keeping with Government's mandate of meeting the health needs of low income households.

EMCP effectively contributed to refurbishing and equipping of the health facilities in KS. The health facilities became more capable of delivering health services at primary level and health services utilisation increased remarkably. Most people believe that generally the situation after EMCP is far better with regard to PHC services performance than before (Awadalkarim, et al1996) and that the health facility that serves them is reasonably close and within walking distance.

* Zakat is a certain amount of many that every adult, free, mentally able Muslim, has to pay to support specific categories mentioned in the holly Qur`an. The poor and the needy are at the top of these categories.

2.7.5.5 Health Insurance Scheme (HIS):

As a part of the Sudan Government commitment of meeting the health needs of the population in general and low income households in particular and after the successful experience of the Economic Medical Care Project in providing health services, the Government launched Health Insurance Scheme in 1995 to overcome the shortcomings of the EMCP.

The basic purpose of HIS is the sharing of the risk and burden of paying for illness among all the members of the scheme whether they are ill or healthy, poor or wealthy. So, individuals find it worthwhile to share the risk through regular payment of insurance premiums to protect themselves from ever having to pay the full cost of illness.
Health insurance is compulsory for groups such as civil servants, people in the formal employment sector and certain other groups.

The Khartoum State HIS created in the early 1995, now provides nearly universal health insurance coverage to the civil servants in KS (at both federal and state levels). The HIS members who receive curative services represent 58 % of the health centres` attendance and 13% of the hospital attendance (MoH-KS statistic report 1999).

HIS is funded through variety of sources including employers (pay 6% of the employees` salaries), employees` (4% of their salaries), state ministry of information and social affairs (pays for poor households), contribution from the federal health insurance public organisation and voluntary health insurance. The premium is deducted directly from salaries. The variation of salaries subsidises the lower income members. A separate health insurance system – a voluntary health insurance- was created within the Health Insurance Scheme to insure those in rural areas and the self-employed for the certain monthly premium.

HIS coverage includes the full cost of curative services and 75% of the drugs` cost. The curative services provided by EMCP health centres and hospitals. Insurance coverage of drugs provided through RDF pharmacies in EMCP health facilities or RDF people pharmacies and very rarely through private pharmacies. HIS pays the full medical services` bill to the EMCP and 75% of the drug bill to the RDF on a monthly basis; the

details may be found on the section discussing the relationship between the RDF and HIS. The success of HIS is now linked to the high availability of drugs in RDF pharmacies (Fundfunda 1998).

The Health Insurance Scheme and the Revolving Drug Fund, Ministry of Health-KS, set a utilisation and cost control measures to ensure that the drug benefits do not bankrupt the insurance scheme through over prescriptions, fraud and abuse. These include prescribing generic products, a health insurance list of drugs, training, supervision, prescription check..etc.

Chapter 3 Pharmaceutical Services:

3.1 Drug Policy:

A National Drug Policy (NDP) is a guide for action and the document is generally written with goals set by the pharmaceutical sector. It provides a useful framework to co-ordinate activities by the various partners of the pharmaceutical sector: the public sector, NGOs, private sector, donors and other interested partners (WHO 1995). Although lasting improvement in people's health is dependent on long-range improvements in their economic, political and social improvements, disease and disability fostered by these factors can often be cured or controlled by the appropriate use of drugs. In addition, the availability and effectiveness of drugs are key factors in generating and maintaining public interest and participation in health related activities (Kanji, et al 1992).

In Sudan, national health policies and plans, till the end of the seventies, did not include any national drug policies or strategies. At the same time, the absence of effective control on the importation and marketing of pharmaceutical products coupled with intensive promotional activities of their procedures resulted in an enormous increase in the number of pharmaceutical products (more than 6000 brand products) marketed and used.

Soon after 1973 the prices of drugs in Sudan started to rise sharply and continuously. The consumption of drugs was also increasing rapidly with expansion of the health services. Consequently, the cost of drug imports was becoming progressively heavy on the state budget and the national economy.

Eventually and towards the end of that decade the state was unable to provide the foreign exchange needed for the unrestricted imports of pharmaceutical products. At that time it was clear that the money had gone for importing products of no proven health need while many vital essential drugs were not available most of the time.

By 1980 the ministry of health was convinced of the need for a comprehensive national drug policy as the only way of providing drugs needed for its national plan for the attainment of health for all by the year 2000. The first National drug Policy (NDP) was adopted in 1981. Since then some amendments were made according to changing circumstances. In 1994 the federal MoH decided that it was time to reformulate the NDP to include all the necessary amendments and to comply with health development strategy and national comprehensive strategy (1992-2002). The new policy was developed through broad consultation and included the formation of several expert committees from senior pharmacists and medical consultants from the public, private sectors and WHO. The document was eventually adopted in 1997 and is being implemented to achieve the following objectives, which include:

- To make available the needs of the population of safe, effective, good quality essential drugs in sufficient quantities at the least possible cost to the individuals and the Government;
- The rational use of essential drugs.
- To protect the population from the health hazards of irrational use of drugs and use of unsafe and sub-standard drugs.

3.2 Essential Drug Concept:

WHO has defined Essential Drugs as those drugs which satisfy the health care needs of the majority of the people; they should therefore be available at all times in adequate amount and in appropriate dosage form.

The selection of such drugs depends on many factors, such as the pattern of the prevalent diseases; the treatment facilities; the training and experience of the available medical personnel; the financial resources; and genetic, demographic and environmental factors.

WHO launched essential drugs programme in 1977 with the publication of the first WHO model list of essential drugs as a part of cost-containment measure and improved availability of drugs. The model list had 220 drugs, vaccines and diagnostic agents in 26

major categories. The list has been revised five times with only a limited number of amendments.

The needs and guidelines for drawing the list are clearly illuminated in WHO list. The federal MoH adopts this and the list that is revised regularly is used by all the states in Sudan.

The fourth edition of the National List of Essential Drugs consists of 246 items. This list has been subdivided according to level of use:

- List AA compiled for PHC units and dressing stations managed by health workers;
- List A contains drugs prescribed by medical assistants in dispensaries and rural health centres;
- List B contains drugs used in rural hospitals and urban health centres with medical doctors.
- List C this is the list for hospitals with specialist departments;
- List S used in specialised units and centres..

It is clear that for the optimal use of limited financial resources the priority should be given to the drugs of proven efficacy, acceptable safety and those that satisfy the real health need of population.

3.3 Drug Situation and Supply in Khartoum State -Sudan:

In Sudan like in the most of the African countries drugs and pharmaceuticals are distributed through three systems: public sector, private commercial and private non-for-profit sector (NGOs).

3.3.1 Pharmacy and drug legislation:

The availability of medicines in Sudan is controlled on the basis of their safety, quality and efficacy. Thus, the government effects control in accordance with the Pharmacy and Poisons Act 1974 and its instruments and orders (subordinate legislation), and directives and orders issued by the federal or state Departments of Pharmacy (DoP). The primary

objective of both federal and KS Departments of Pharmacy is to safeguard public health by ensuring that all medicines and pharmaceuticals on the Sudan market meet appropriate standards of safety, quality and efficacy. The safeguarding of public health is achieved largely through a system of medicines` registration and licensing of pharmacy premises.

3.3.2 Registration of medicines:

The federal DoP is responsible for the appraisal and registration of all medicines and other pharmaceuticals for both human and veterinary use on the Sudan market. It is also responsible for the verification of the competence of manufacturing companies and their manufacturing plants and their ability to produce substances or products of high quality before registering these companies and allowing them to apply for registration of their product in Sudan, and when necessary, to visit those companies and their manufacturing units, to verify their compliance with good manufacturing practice recommended by WHO. The applicant for registration of pharmaceutical product must submit all prescribed data and the certificates required under the WHO certification scheme for a pharmaceutical product moving into international commerce, and any other information that is necessary for assuring the quality, efficiency and stability of the product through its shelf life (NDP1997).

3.3.3 Licensing of pharmacy premises:

The licensing is a registration exercise to provide the DoP at state level (federal level in case of local manufacturing plants) with the information necessary for the full implementation of the Pharmacy and Poisons Act. Licenses are granted for a period of one year. They may be renewed at the end of December every year by application to the relevant DoP before expiry of the current license. There are three major licenses as follows:

a) License A (Wholesaler License):

Authorises the holder to sell a registered medicine to a person who buys the medicine for the purpose of sale or supply to someone else under the direct supervision of a registered pharmacist or licensed medical doctor. Licensing of the wholesalers involves identification of the wholesaler and suitability of the premise. There are around 150 wholesalers, the majority of (137 wholesalers) them are local agents for the goods manufactured from abroad and 13 "local manufacturer" wholesalers in KS and who distribute their medicines to the whole country. Wholesalers are inspected by the state DoP before license is granted and thereafter at least once per year.

b) License B (Retail Pharmacy License):

Authorises the holder to sell a registered medicine to a patient on prescription or over-the-counter basis, under direct supervision of the registered pharmacist. The pharmacies are inspected before a license is issued and thereafter at least twice per year.
In Sudan there are two types of retail pharmacy:

- Commercial Private Pharmacies: these are private establishments retailing registered drugs and medical supplies at a mark-up of 18%. The source of the drugs and pharmaceuticals is private wholesalers. There are 390 private pharmacies in KS (1999).
- People's Pharmacies: these are quasi-public establishments retailing drugs and medical supplies at below market prices to improve access and availability of pharmaceuticals. They were founded in the early 1980s as a pilot study for a drug cost recovery system. They differ from the private commercial pharmacies; firstly, in having access to the Central Medical Supplies Public Organisation (CMSPO) drugs i.e. generic and large pack products, in addition to the brand products from the private wholesalers. Secondly, the people's pharmacies are only owned by public organisations (e.g. hospitals), people's committees, trade unions and NGOs. Mark-up on cost for drugs from CMSPO 35% and from private drug wholesalers, profit margin is 10%.

13 out of 83 people's pharmacies in KS is owned by the state MoH and managed by the RDF.

c) License D (Manufacturer's License):

Manufacturing includes any process carried in the course of making a medicinal product. A manufacturer's license covers all aspects- bulk drug, product manufacture, filling, labelling and packaging – under supervision of a registered pharmacist.

There are 13 generic manufacturing sites in KS, each of which is inspected by the federal DoP. Good manufacturing practice (GMP) is the basis of this inspection. Effective control of quality requires that a manufacturer possess the appropriate facilities with respect to premises, equipment, staff, expertise and effective well-equipped quality control laboratory. Normally before a license is granted, an inspection of premises is made and federal DoP takes this into account. The local manufacturers produce 65 pharmaceutical dosage forms of essential drugs and cover 60% of the CMSPO purchases.

3.3.4 Drug supply in the public sector:

The main sources of drugs in KS public sector health facilities are Central Medical Supplies Public Organisation (CMSPO) and Revolving Drug Fund –Ministry of Health –KS.

3.3.4.1. Central Medical Supplies Public Organisation:

The Central Medical Supplies, "the directorate general for medical supplies" within the federal MoH became autonomous in 1991 and was renamed CMSPO with a board chaired by the federal Minister of health. The CMSPO procures only in accordance with the Sudan National List of Essential Drugs (NLED) and for the national care system. Federal Government hospitals, health ministries of different states and certain other hospitals buy their drugs and pharmaceutical supplies from the CMSPO. These categories and people's pharmacies pay a 20 percent mark-up and private pharmacies pay 25 percent mark-up. Some NGOs and donor agencies pay for hard currency. Procurement takes place from local and overseas manufacturers and to lesser extent from non-profit suppliers such as the united nation children fund (UNICEF). The

CMSPO purchases large pack generic drugs in bulk through tenders, thus, making its drug prices bellow whole sale prices charged to private pharmacies for brand, normal patient's pack.

Quality assurance procedures are in place, including sampling of products from suppliers. Testing is done in the National Quality Control and Drug Research Laboratories, before releasing of drugs to clients. CMSPO has its own quality control laboratories for regular check of their stock.

3.3.5 Non Governmental Organisations:

NGOs play an important role in the health services in Sudan in general and Khartoum State in particular. There are around 202 PHC units in KS most of them in displaced camps where drugs are distributed free of charges. These units are according to the MoH specifications and subjected to the inspection visits of MoH officials.

Some NGOs in KS, particularly in urban areas, adopted user fees mechanism to remain viable and essential drugs are often sold at a mark-up to subsidise other costs.
According to the federal Department of Pharmacy regulation, NGOs provide drugs and follow the same procedures used in CMSPO`s tenders in their procurement i.e. purchase from sources registered in Sudan, drugs should be on the national list of essential drugs, provide samples for quality testing, drugs should be in large hospital packs. . etc.

3.3.5.1 Displaced People Essential Drugs Programme:

MoH-KS and Save the Children Fund -United Kingdom (SCF-UK) Sudan office, developing an essential drug programme for the displaced people in KS. The programme's drug list contains 36 items relevant to disease pattern in the displaced camps. These drugs are distributed free of charge through clinics of 6 local NGOs under supervision and control of department of pharmacy –KS and their SCF-counterpart.
SCF procures drugs on annual basis, according to the specification and quantities agreed upon with the state department of pharmacy.

Chapter 4 Revolving Drug Fund, Ministry of Health –Khartoum State

4.1 Historical Background:

In 1984 the Director of the Children's Emergency Hospital (CEH) of Khartoum, noted that common childhood diseases were making up increasing proportions of admissions to the hospital. The admitted cases merely represented the tip of the iceberg, which indicated the inability of primary health services to provide appropriate health care to those who most needed such services. It was beyond the capabilities of the CEH to handle such a load since it is more appreciated, cost effective and convenient to the patient to present to the PHC facility nearest to his place of residence. However, this was not possible because the primary level of the health system was unable to deal with most of the childhood diseases. This was due to the deterioration of the physical conditions of the health facilities, incomplete lists of appropriate medical equipment for curative and preventive services (especially for mothers and children care) and drug supplies to the health centres. The drug supply to the health centres was drastically inadequate, forcing patients who consult services to fill their prescription in private pharmacies, which are sparsely distributed and mainly in the cities` market areas in Khartoum State, and thus unable to fill the gap. Even the presence of pharmacies may not in itself guarantee access. The urban population are also prevented from having access to the drugs due to the high prices of drugs available through the private sector and the shortage of free drugs available in the public sector facilities. The situation was worsened in rural and periurban areas where the private pharmacies are not available.

The CEH Director made a proposal to Save the Children Fund (SCF-UK) for improvement of health services in Khartoum. This proposal coupled with the severe shortage of government funds to meet recurrent cost encouraged SCF (UK) to sign an agreement with the Ministry of Health of Khartoum State. Thus, SCF (UK) together with the MoH KS initiated the Khartoum Comprehensive Child Care Programme (KCCCP). The project was design to rescue and revitalise peripheral and urban health services from almost complete collapse using the sale of essential drugs at health centre level as the basis for cost recovery system. This meant providing of a seed stock of essential drugs, basic medical equipment for health centres (60 centres), and funds for

training and support in Khartoum state. The programme was initially sanctioned by a decree in December 1985 which was ratified on 17th February 1987. However, after intense planning and preparation the launching of the Revolving Drug Fund (RDF) in Khartoum started in 1989 with just 13 health centres mainly located in urban and periurban areas of KS. According to its obligation in the agreement, SCF (UK) provided the capital seed stock of drugs (UK£ 1.8 million) for the RDF, in separate lots of drug consignments that were completed in 1992. Since then, RDF uses its own drug-sales revenues for the purchase of further drug supplies and to pay for operating expenses.

The income of the RDF is still solely derived from sales of drugs at the health facilities. The Revolving Drug Fund (RDF) together with the primary health care project Comprehensive Child Care (CCC) make up the KCCCP which is a joint health programme between the SCF (UK) and MoH (KS).

RDF at its initiative was to supply drugs to only 60 health centres as a precondition of the quality of health care. Today the total number of health facilities operating the RDF is 96 (79 health centres and 17 hospitals) with 31 of the health centres operating two shifts. This is in addition to 13 people's pharmacies managed by the programme (Fig. 4.1)

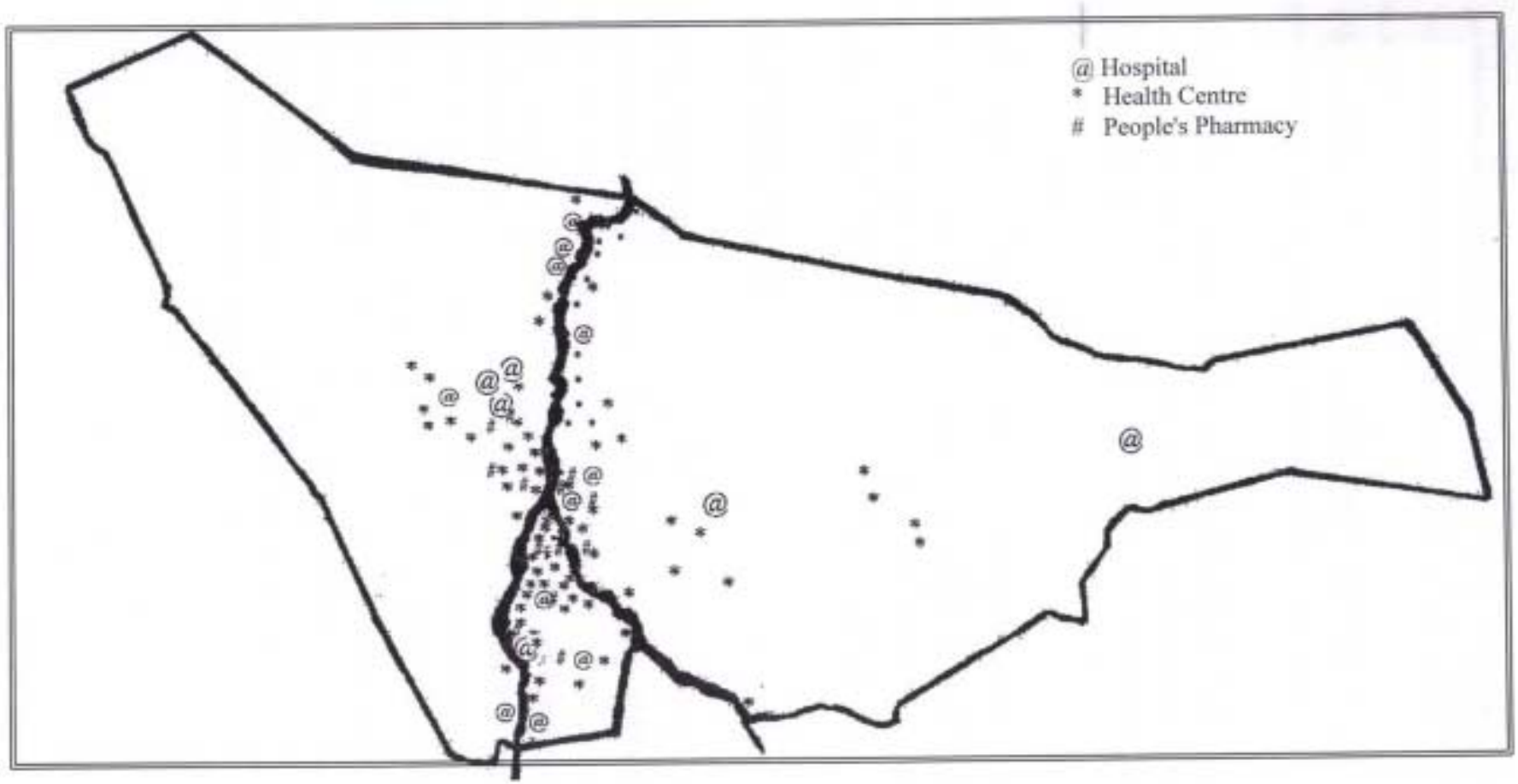
4.1.1 Aims:

The overall goal of RDF was to establish a reliable supply of safe, and affordable essential drugs to the community (Mothers and children, to those who can least afford them or those who have to travel great distances, that is, the poor and those in rural areas) with full area coverage and full cost recovery within the PHC. The project was thus in line with the KS interpretation of Alma Ata Declaration.

Objectives:

- to provide essential drugs to the KS population, especially in rural and periurban areas, at affordable price which is less than that at alternative sources, so patients are willing to pay for drugs;
- to use the revenues collected from the drug sales to replenish the stock by purchasing more drugs;

Figure 4.1: RDF Health Facilities -Khartoum State



- to put into place an effective drug supply at affordable cost to the ministry of health;
- to put into place a financially self-sustaining system of drug supply to the KS population;
- to enhance better utilisation of health services and encourage rational use of drugs;
- capacity building and management development at all levels of the system.

According to the technical agreement between the MoH (KS) and SCF (UK), to achieve full institutionalisation of the project within the MoH. The MoH requested the transfer of the project, because this cannot go on forever and the MoH has to take over its responsibility.

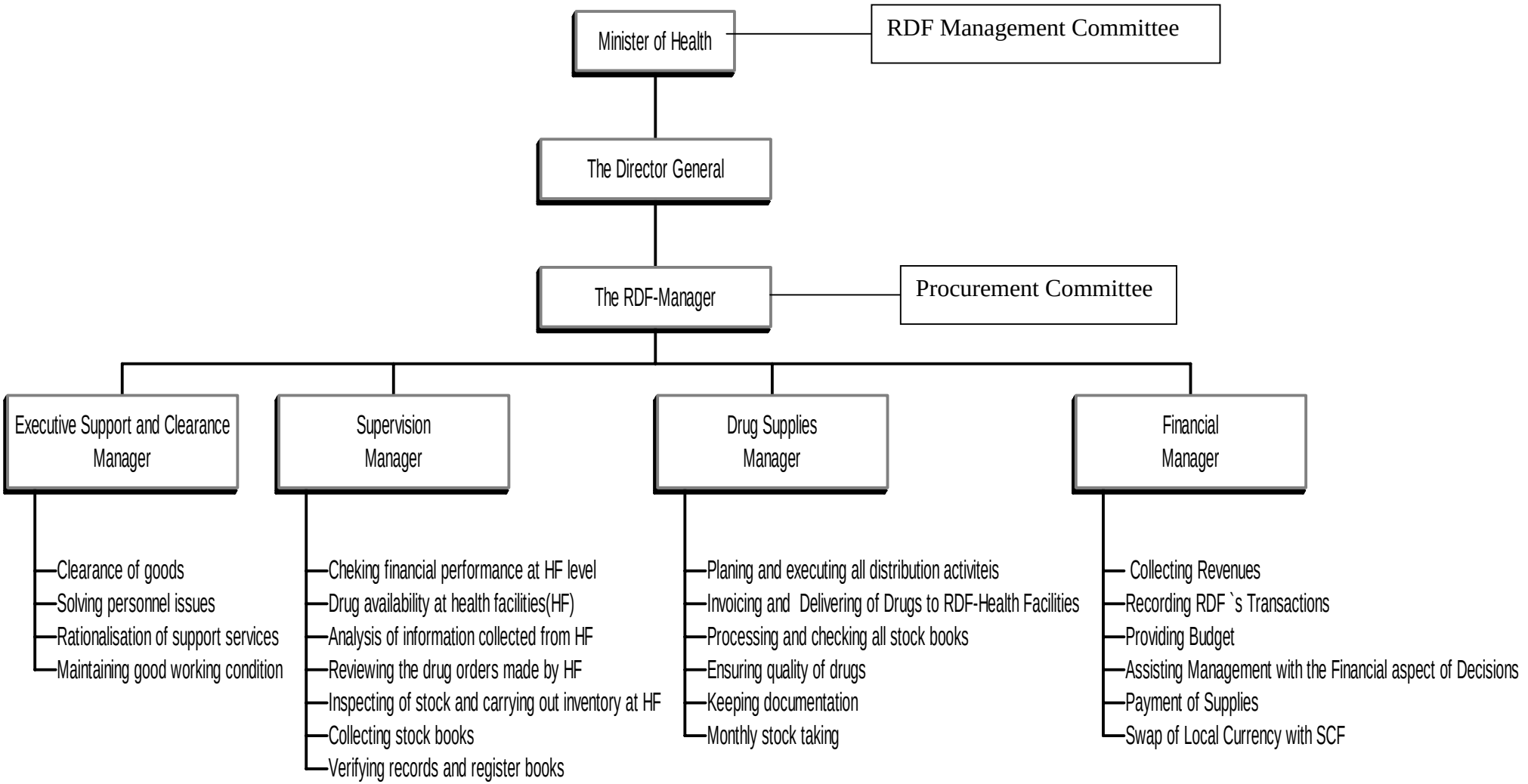
On the thirty first of March 1996 the RDF had been handed over to the MoH. The MoH gave the project its complete financial freedom, from the rules that govern the publicly financial projects. The RDF money is kept in a separate bank account and cannot be used for any thing apart from RDF`s Drug purchases and operating costs.

4.2 Organisational Structure:

The RDF is an independent project within the MoH. It is under the direct supervision of the Director General (Fig. 4.2) and has a direct link with the minister of Health. This autonomous structure was established to achieve the efficiency and flexibility associated with private management while maintaining sufficient public sector supervision to ensure that the RDF provides essential drugs at reasonable prices, with adequate control of quality. The main features of the autonomous RDF organisational structure are:

- management committee composed of the Minister (the chairman), the Director General, the RDF manager and the director of the health planning department;
- the project manager and all team leaders are trained pharmacists;
- the RDF pays adequate incentives for staff on semi private basis;
- sound financial management and clear discipline system.

Figure 4.2: RDF's Organisational Structure



This autonomous framework is allowing the RDF to hold funds, regulating procedures for drug purchase, storage, distribution, sale, cash collection, accountancy, supervision, audit and control and training of staff for projects which now has annual turnover of UK£ 2.1 million (RDF Report 1999). The status of legalised autonomous RDF management with a business like orientation appeared to be advantageous as a method of protecting the RDF against Ministry of Finance.

The management tools necessarily for procurement, stockholding and distribution and cash collection are in place. All administrative procedures designed to monitor the consistency of stock and funds are placed upon increasing and building operational efficiency.

Major routine functions of the RDF manager include: securing an adequate drug supply system; pricing setting and securing affordability of the project; products` selection (review and revision of the RDF drug list); hard currency availability and building the capacity of the RDF personnel.

The RDF management consists of four departments: drug supply; supervision; financial and executive support and clearance departments. Each department within the RDF performs according to written procedures. The basis of this approach was to establish a quality service provision, create a means identifying weakness which could then be corrected on the spot, identify training needs and to establish self audit (Fundafunda 1998).

4.2.1 Drug supply department:

This department is to ensure the flow of drugs and related documents, from the point of entry into the Sudan, through intermediate storage at RDF warehouses to the point of delivery, in the most efficient and well-controlled way. It is therefore responsible for delivery of drugs to all RDF health facilities in Khartoum State. The drug supply department has to recognise and administer the sales to other authorised clients, all in accordance with the prevailing need and availability. It also reports to the RDF manager on a monthly basis. These reports are: a monthly stock taking report; quantities of drugs distributed to the RDF health facilities and those to outside RDF clients and drugs

received at the warehouse. This department exercises the following responsibilities and tasks:

1. plans and executes all activities in respect of incoming transport, as well as storage and outgoing transport;
2. registration and administration (stock administration and control) of all RDF drugs;
3. invoicing and sales of drugs to the RDF health facilities and others;
4. processes and checks all stock books (drug orders) from health facilities and requisition from other clients;
5. keeps records of quantities of drugs received and those delivered to the health facilities and others;
6. organises, executes and controls cash sales to the outside RDF clients.

4.2.2 Supervision department:

Regular monitoring and supervision are essential to assess the impact of RDF on the patients, financial performance, drug availability and key aspects of the cash collection and accounting system. The supervision department responsible for all activities related to the supervision and analysis of information -is collected from the health facilities- and makes decisions accordingly. There are six supervision teams: Khartoum provinces, Omdurman provinces, Khartoum North, East Nile, Hospitals and people's pharmacies teams. Each team consists of pharmacists (team leader), assistant pharmacist, two accountants and driver. The supervision team exercises the following activities at health facilities:

1. inspects the stock and carries out inventory ;
2. verifies the records and registration books and extract relevant information for the RDF financial department;
3. collects the cash after cross checking with quantities of drug sold;
4. collects the stock books (during the last week) every month;
5. reviews the drug order (team leader) made by the health centres` assistant pharmacists (hospitals drug orders go directly to the warehouse) and approval is forwarded to the drug supply department at the RDF warehouse in Khartoum North during the first week every month.

The supervision takes place on a daily basis and the health facilities are visited either every week (Hospitals and class* A and B health centres) or twice per month (class C health centres). People pharmacies are visited twice per week for cash collection. The drugs are delivered to the people pharmacies on request basis.

The supervision teams used agree a checklist (Appendix 3) which helps them to ensure that the critical functions are reviewed. The checklist includes all supervision target activities such as availability of drugs, clean pharmacy, store conditions, financial reconciliation, drug repackaging, labelling ..etc. In addition to the scheduled supervision, the team leaders conduct a surprise visit for each health facility at least once per month.

4.2.3 Executive support and clearance department:

This department was established as a direct result of the reorganisation and restructuring of the RDF after its handover to the MoH in 1996. The aim is to ensure that the different departments of the RDF have at their disposal the infrastructure and support they need to perform their work as effectively and efficiently as possible. It is also responsible for the clearance of RDF drugs at both Port Sudan and Khartoum airport, personnel management and rationalisation of support services such as transport, equipment, stationary ..etc

4.2.4 Finance department:

The survival of any organisation depends ultimately on its economic viability to cover its operating cost and to make a surplus. Hence the effective management of the finance function is crucial to success. The RDF financial system has been designed to provide reasonable assurance that assets are safeguarded, authorised transactions are properly recorded, and that material errors or irregularities are either prevented or would be detected within a timely period. The system also ensures a reliable collection of fees, safekeeping of revenues and proper expenditure of revenues. This is achieved through implementation of standard procedures for fee collection, stock control and valuation, reporting, banking, auditing and control of expenditures.

* Health centres are classified according to their annual revenues to A, B and C (lowest revenues).

The internal financial control system is based on a framework of regular management information, administrative procedures including the segregation of duties, and a system of accountability. In particular, it includes:

- regular reviews by the RDF management committee of monthly and annual financial reports which indicate financial performance against the forecast;
- setting targets through the RDF management committee to measure financial and other performance;
- control and process all financial information, activities and obligations (including incentives), regarding RDF;
- develop standard methods for budget projection for RDF operations especially local currency devaluation;
- produce annual budgets for all RDF operations;
- monitor the budgets, in particular, those for the operating costs;
- monitor personnel data from within the RDF and execute actions according to the regulations;
- prepare the financial statements on an ongoing concern basis.

4.2.5 RDF Human resources:

Operating a RDF requires far more expertise than simply distributing free drugs. As a result, it is sometimes difficult to find specialists who have the technical and management skills necessary to implement and operate a RDF. For example governmental managers and accountants are often unfamiliar with the classic income statement and balance sheet accounting that is conventionally used in business. The RDF KS recruited its manager and financial manager from the commercial private sector to make the project business oriented rather than public drug supply department orientated. For this reason and to ensure that the project's framework became sustainable, from the very beginning the RDF worked with competent local staff with only two expatriate staff from the SCF who worked as co-ordinators at higher management level. This created confidence in the staff's own competence, personal commitment and smooth handover and thereafter sustainability of the project. With respect to sustainability, the project concentrated on staff competence, efficient procedure and simple organisational structure with team spirit to achieve the targets.

4.2.5.1 Small staff and efficient team work:

The RDF staff are divided into two levels: the RDF Head Office and health facilities and people's pharmacies level. The RDF Head Office staff consists of 8 pharmacists, 15 accounting staff, 1 secretary, 7 store keepers, 6 assistants pharmacist, 2 invoicing staff, 2 clearance staff, 15 drivers, 2 cleaners and 16 labours at the warehouse.

The people's pharmacies staff consists of 14 pharmacists, 16 assistants pharmacist, 13 cashiers and 13 cleaners. The health facilities (hospitals and health centres) staff consist mainly of 19 pharmacists (at hospitals), 138 assistant pharmacists and 127 cashiers.
The RDF has no direct administrative role on the health facilities (HFs) staff. They signed a written contract to work with the RDF, rather than permanent civil servants. According to this contract RDF pays them incentive on performance basis. This includes the achievement of the targets set on the contract. HFs staff are under the direct responsibility of a health facility medical director and perform according to the RDF guidelines. They receive their salaries from the MoH general budget.

The RDF Head Office staff are divided into 9 working teams. These are: six supervision teams, the warehouse team, delivery team and accountants team. Each team leader presents a brief written report to the RDF weekly management meeting. The RDF manager presents an accumulative monthly report together with a financial report to the RDF management committee.

To strengthen the team work RDF has a written job description and management manual, which specifies staff responsibilities and roles in the teams and RDF operating procedures.

4.2.5.2 RDF recruitment system:

All levels of RDF are staffed by the MoH. The RDF continues to face a number of difficulties in this field, which include the wide shortages in pharmacists. Nevertheless, a significant achievement was that, the RDF for the first time retained its pharmacists in 1998 through introduction of incentives. The incentive structure is related to performance.

The RDF staff numbers have continued to increase during the last 4 years (1996-1999) as a result of the RDF expansion. The recruitment continues to be a key area of MoH personnel department activity.

4.2.5.3 Staff motivation:

The RDF is continuing to increase incentives and improve working conditions to ensure that suitably qualified and skilled staff (especially pharmacists) are retained for a longer period.

Recruitment of qualified individuals (which may include looking outside the public service), a clear definition of job assignments (staff at HFs level enter into written contracts to perform according to RDF guidelines) and regular supervision assist the RDF to achieve a good staff performance.

RDF continues to help its team leaders to bring out the best performance from their staff by running an effective appraisal process providing clear and honest feed back about their performance on annual basis. The annual meeting of rewarding and a performance certificates (signed by the Minister) presentation to those who achieve targets (calculated on the basis of indicators showing good financial and stock management) is addressed by the Director General of the MoH.

RDF provides transport to staff from their residences to the place of work to increase their motivation. In addition to social programmes which help the project to build a cohesive productive team.

4.2.5.4 Staff training:

The RDF, as a leader in drug supply, fully recognises that its business is achieved through people's expertise, and that appropriate training and development is key to its continued and future success. The RDF has provided a wide variety of external and internal training and development opportunities for its staff. Joint training was conducted together with the essential drug programme, for prescribers and dispensers of HFs in the rational drug use. The RDF has continued to provide computer skill training

for all staff. The RDF Head Office has developed external continuing education programme for pharmacists to strengthen their technical capacity especially in the field of drug supply and to motivate them.

4.2.5.5 Staff incentives:

The RDF, like other departments at the MoH, has suffered from a lack of staff retention. Senior staff working on the fund have in the past been attracted to work outside the MoH, on the basis of salaries offered in the private sector resulting in high staff turnover especially pharmacists. In order to stem the flow and increase staff performance, the RDF after 1996 introduced a new payment policy. According to this policy, the RDF pays incentives to its pharmacist staff on a semi-private basis. This is reflected in the increase in the incentive budget line, from 1995 (Appendix 1). The justification is that the senior staff have been retained for a considerable period of time on the fund. Although existence of this line may be seen as controversial in public institution improvement, the increase in income and decrease in the revenues deficit justify its introduction. Records show that bad debts were increasing since 1994 (78.5 Million LS). Introduction of the new employment contract and the application of the incentive budget line opposite performance, resulted in the reduction of the bad debts at health facilities (Appendix 1) to 8.7 Million LS in 1996 and to NIL since 1997. This resulted in further improvement of the income, which further justifies the use of incentive pay (Fundafunda 1998).

To prevent medical and paramedical personnel (Prescribers) from making therapeutic decision on the profit ground, their salaries and incentives and the operating costs of the facilities they work for are paid from the MoH general budget.

4.2.5.6 RDF Discipline system:

The RDF realises that, even the best design systems for financial management and accountability require enforcement. A health facilities supervision team focuses on the areas of potential abuse. Disciplinary procedures provide a range of possible responses, from warnings through dismissal, depending on the severity and frequency of the offence. RDF team leaders are trained to invoke disciplinary procedures and to bring

criminal charges when necessary. Government procedures on misuse of public funds are visibly and vigorously applied to ensure full collection and proper expenditure of RDF revenues. These disciplinary procedures are applied according to the RDF and HF staff contract.

4.3 Implementation of the RDF:

In reality however, the start-up effort to implement such a complex system as the RDF can only be done in phases. Success depends on developing and testing drug supply procedures, community sensitisation, selection and training of personnel, renovation or construction of facilities and financial management system. A phased approach over a reasonable period of time (1989- 1996) led to public acceptance, a well designed fee collection system, a management capacity building and a well-trained RDF staff. In addition, a phased approach offers advantage of firmly establishing a reliable drug supply, effective financial management and efficient pricing, inventory and accountability systems.

During the RDF implementation period, the RDF does not intended to expand any further before ensuring that the capacity of the drug supply system can provide a steady supply of essential drugs.

Phased implementation of the RDF started at the health centres (HCs) level.
Advantages of beginning at the HCs level are:

- demand: communities are actively interested in ensuring a regular supply of essential drugs;
- support for PHC: increasing drug availability at the health centres level attracts people for essential PHC services and lightens the burden on the hospitals (strengthens referral system);
- lack of alternatives: rural and periurban population often have fewer choices in health care;
- community involvement: a bottom-up approach provide greater opportunity for community participation. The scarcity of drugs at health centres makes public reacts

positively towards RDF. This is because RDF has resulted in a noticeable increase in the availability of drugs in those health centres supplied by the RDF.

The RDF implementation comprised four phases:

Phase 1 1989: initiated the RDF in 13 health centres mainly located in urban and periurban areas of KS;

Phase 2 1990 to 1991: during this period 14 HCs were included in the RDF; 50% of them are located in the periphery of Khartoum Capital;

Phase 3 1991 to 1992: in this period 7 other health centres started to operate RDF`s 3 of them are in the rural areas of KS;

Phase 5 1992 to date: the RDF was implemented in all health facilities of MoH –KS.

In the first three phases the obligation of the RDF in addition to the monthly supply of drugs, were: refurbishment and security of the pharmacy room. This, was in addition to ensuring that all recurrent costs of drug component -procurement, storage, distribution, restocking and financial management and supervision- were covered by RDF support fund from SCF. In the last phase, RDF`s obligation was the monthly supply of drugs.

4.4 Community Participation:

When it is decided to implement the project at any health centre two meetings are held: One with health centre staff (an orientation meeting on how the RDF works and how the work should be done; an assistant pharmacist and cashier who were appointed for the health centre go for short training period (3 to 4 days) in a nearest RDF health facility). This training focuses on the information needs of pharmacy, drug management, records keeping, RDF cash collection system and patients communication. A second meeting with the community in the health centre catchment area (an awareness meeting to inform them about the RDF and involve them in the project, and to answer any question they may have regarding the RDF). However, for one reason or another, the RDF stopped the orientation meetings. But it must be recognised that, these sessions are important for the following reasons:

- communication to the public is important to gain acceptance which is vital for the implementation and development of the RDF;

- community involvement can be essential for the credibility and accountability of the RDF;
- involvement of community leaders and provision of information to the public are practically important at the outset, when RDF is just being introduced or when there are major changes;
- staff orientation will enable them to correctly inform patients and public about the RDF;
- without the understanding , acceptance and support of prescribers, the development and growth of an RDF will be problematic.

In reaching PHC targets, it will necessarily demand the participation and involvement of service users. The RDF needs to develop ways to include the community in its structure. The activation of the health area strategy will result in extended community participation in PHC, especially in the RDF.

4.5 RDF Material Resources:

4.5.1 RDF Warehousing:

The RDF receives all its drugs and pharmaceutical supplies (including cold-chain items) at its especially designed and secure warehouse in Khartoum North.

At the beginning of the project the MoH KS allocated one store for storage of the RDF drugs. This, however, soon proved to be small with the expansion of the project. In 1993, the RDF built its own spacious, air-cooled, clean and airy bulk warehouse (300 sq. metres) suitable for drug storage (at a cost of 15 Million LS). With continuos expansion of the RDF, the warehouse was again too small, and the third building of 800 sq. metres space was constructed with RDF funds in 1999 (at a cost of 230 Million LS). The new store has been properly built, with modern storage specifications for drugs. The old stores are provided with 8 solar fridges, which are used, for the storage of insulin and other items that require cold storage.

4.5.2 RDF Pharmacy at Health Facilities:

RDF pharmacy at health facilities is administratively (like other health facility sections), under the direct supervision of the medical director and technically supervised by the RDF supervision team leader. The pharmacist or assistant pharmacist is responsible to the supervision team leader for his financial responsibility, drug management, storage requirement, repackaging and labelling of the drugs, clean pharmacy.. etc. The pharmacy information system is mainly directed towards financial accounting and prescription records. Two register books are present at all pharmacies:

- the cashier register book for entering information on dispensing pattern, such as description and quantity of drugs sold, patients` names and course of treatment value.
- Safe-register book, which includes the registration of daily cash collection and weekly cash withdrawal by the supervision team senior accountant. Registration in both register books is made by the cashier and checked by pharmacist or assistant pharmacist (in health centres).

Other records in the pharmacy include: latest price list, all drug invoices, all drug-withdrawing vouchers, stock book, all money withdrawing receipts and all dispensed prescriptions (attached with consultation tickets in case of health centres). The prescriptions should be kept for at least one year.

Accounting and inventory take place on scheduled timetable to let pharmacy staff be well prepared for stock physical count, and to make supervision team assignment easier and faster (the team covers 2-3 health centres during working hours per day). Money collected and supplies brought on vertical basis.

The drugs in the pharmacy are stored in a well-organised manner (Alphabetically), that easily enables inspection and inventory. First in- First out (FIFO) principles are applied for drug dispensing. Surplus medicines and those of 6-months shelf life are commonly withdrawn (using drug withdrawing form Appendix 2) and redistributed to relevant pharmacies to avoid its expiration. This policy has helped to reduce stock levels held at health facilities, which previously had contributed to the level of losses through stock write-off (e.g. 26.4 Million LS in 1995 to NIL in 1999).

Drug quota that is estimated according to consumption at the health facility is received at fixed date every month. However, supplementary requests are always met within 24 hours if need be.

4.5.3 RDF Fleet of vehicles:

Transport is a crucial to the success of the RDF. The RDF fleet of vehicles helps the project to achieve its targets of supervision visits (2676 out of 2755) and drug delivery tours (100%) in 1999. Costs are under control and efficiency is monitored. The vehicles (9) were purchased by SCF from the programme support fund and 5 vehicles from the MoH. In 1997, all vehicles were upgraded from the RDF fund including the local procurement of 5 pick-up vans to replace the oldest ones. The RDF fleet is composed of 14 vehicles, allocated as follows:

- 6 4-WD vans for supervision;
- 3 Trucks and 3 Toyota pick-up for drug delivery ;
- 2 small vehicles for daily activities and follow-up at the RDF Head Office.

4.5.4 Communications:

Poor communication on the RDF had a poor effect on its ability to respond to needs from both rural and urban health centres, and within its management structure. By 1994, a number of health centres had received radiotelephone link. Presently, 30 urban health centres are radiotelephone and some with telephone; 15 rural health centres have radiophone and all hospitals and people's pharmacies have telephone. All offices and warehouse are on telephone. In effect, communication capacity has largely improved. Thus, response time is far reduced, drugs shortage at health facilities is now dealt with in a few hours or within twenty-four hours, as opposed to days before the handover (Fundafunda 1998).

Chapter 5 RDF Drug Supply System

5.1 Introduction:

The economic objective of a drug supply system is to ensure supply of safe, effective, good quality drugs at the least possible cost to the people who need them. This means that criteria of cost-effectiveness must be combined with criteria of quality (Dumoulin, et al 1998). The pharmaceutical supply system is the most straight forward. It runs from the manufacturer to the patient and passes through the stages of: Procurement, Distribution, Delivery and Uses of Drugs. In addition to the above stages, the following functions are usually involved: Selection, Quantification and Quality Control.

Information required in drug supply:

a) supply information : this is information about the availability of drugs, usefulness and efficacy of drugs and suppliers` prices and condition of payment;
b) demand information: this includes information regarding drugs requested by prescribers and patients, quantities required for procurement, distribution and prescription and quality of drugs ;
c) information on the relationship between supply and demand: information about the actual consumption in volume and value, shortage and current prices.

RDF survival depends on a regular supply of low-cost, high quality drugs to the health facilities. If procurement and distribution are not reliable, the RDF will quickly stop functioning.

To determine the initial capital investment required to meet this criteria, it is useful to think of the RDF drug supply system as a " pipeline" (Peter, et al 1986). To assure a continuous supply of drugs at health facilities, the pipeline (Fig. 1.1) must be filled; once filled, consumption must be matched by purchases at the central level. The pipeline includes not only the flow of drug from the RDF warehouse to the health facilities, but also the flow of money back to the RDF bank account to be used by drugs procurement committee. Without the return of funds new procurement can not be made, supply becomes erratic, and the system soon fails to revolve.

Two factors influence the amount of capital required to fill the pipeline: the diameter of the pipeline and the length of the pipeline. The diameter is determined by the volume of sales per month, which relates rate of drug consumption. The length of the pipeline represents the amount of time between the first commitment of the fund for drugs until the money collected from the sale of those drugs are again available for buying replacement stock. The length is determined by procurement practices, supplier lead times, the distribution network, stocking policies, cash flow arrangements and related factors. The investment capital required is simply the product of the diameter of the pipeline expressed in volume of sales per month and the length of the pipeline expressed in months.

5.2 Selection:

Because of using a fixed drug fund (one time capital investment) and because it is not a profit-making project, the drug list is a fundamental exercise to the RDF. It is often necessary for RDF to procure and distribute only those drugs that are most needed, efficient and cheap. The selection of drugs on the RDF list focuses on these high priority drugs. From RDF economic perspective, it is good to keep the number of drug to be procured, distributed and used as small as possible as this reduces certain cost, increases the access and facilitates rational use of drugs.

Advantage of having short RDF drug list:

1. the effect on the procurement costs: when fewer different drugs are selected, larger quantities of each drug can be purchased. This larger quantity will reduce the cost;
2. the effect on the cost of stock- keeping: a small number of drugs eases stock management because there is less movement in and out and fewer registers and document to be kept;
3. the effect on the accessibility to essential drugs: selection of fewer essential drugs increase the access to the most essential drugs by increasing the purchased quantities of each item;
4. the effect on quantification: quantification of the limited number of drugs is easier and more accurate;

5. the effect on the fund: having limited funds, the selection of fewer drugs increases the coverage and leads to maximum use of the small budget available for the RDF. Generally, RDFs without a limited number of items and a reliable source of low – cost drugs have quickly ceased to revolve.
6. The effect on drug prescription: reducing the variety of drugs can improve treatment decisions because the training of prescribers is facilitated, side effects are easier to memorise and, above all opportunities for irrational treatment can be reduced;
7. The effect of generic name on the cost: the RDF uses generic drugs because the generic drugs are significantly less expensive (often 50 to 70 %less) than their brand equivalents (Ballence, et al 1992) and the potential to reduce the costs and improve affordability is substantial. The advantage of these lower prices products does not compromise the quality.

5.2.1 Design of RDF Drug List:

The RDF drug list design committee recognises that the starting point for an essential drugs policy is the careful selection and quantification of drug needs according to the health needs of the population to be served. The committee of the RDF list involves balancing consideration of cost with those of efficacy, safety, ease of administration, and other local considerations. As a result, supply of high-cost, low volume drugs with limited health impact is left to the private sector, since such drugs can tie up working capital and result in losses due to expiry.

The list has had changes since its inception on KCCCP (1989), reflecting growing needs and development in prescribing pattern. Whereas, the list contained mainly prescription essential drugs (e.g. 72 drug items in 1995, including disposable syringes with needles); the current list contains radiographic materials and surgical sundries. These additions followed stated need and reflect confidence in the RDF supply system. In the past, inclusion of non-drug items was initially unacceptable. Presently, the total number of items on the list is 194 items (Fundafunda 1998), divided into 85 items on the main list (Appendix 4) and 109 items mainly surgical sundries (such as sutures, valves, pacemakers.. etc) in addition to pre and post operative items. The kind of medicine and prescription differ from level to level (hospitals and health centres) according to the

classification of the Sudan National List of Essential Drugs. This allowed health services to rationalise prescription. The RDF list is taken from the Sudan National List of Essential Drugs and the Sudan National Formulary (SNF). Inclusion of an item on the list was initially through advice presented to the Department of Pharmacy-KS. By 1995, the RDF set up a drug selection committee, which considered each recommendation. This committee now consists of representatives of RDF, PHC and curative medicine departments. The proposal is usually circulated to the MoH Hospitals` specialists for their comments. The addition or deletion of an item from the list must be justified. Finally the proposal is approved by the RDF selection committee and comes to action from the coming RDF order.

5.3 Procurement:

The objective of the procurement is to acquire the drugs that are strictly necessary at the least possible cost. This cost comprises the price of purchase from the supplier in addition to many other costs that are sometimes difficult to quantify. These costs such as, transaction cost, delivery costs, cost of packaging, bank charges, custom duties, port and clearance charges, costs of insurance and freight and quality testing cost. An effective procurement process ensures the availability of the right drugs in the right quantities, at reasonable prices, and at recognised standards of quality (Quick, et al 1997).

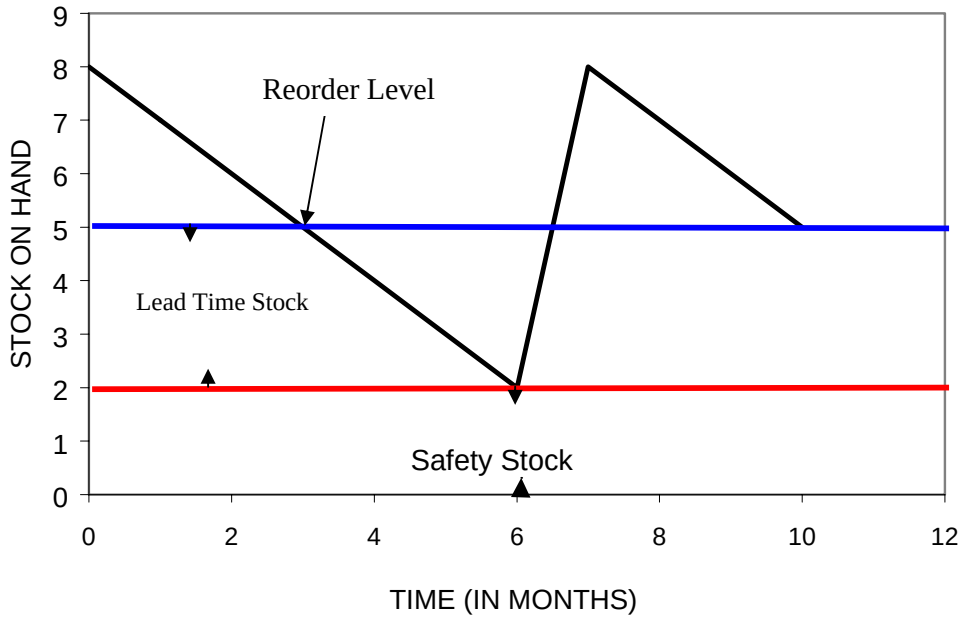
5.3.1 Need assessments:

The required quantities of drugs may be calculated by the basis of the past consumption or morbidity data (actual need). Although morbidity data is available at MoH health facilities, RDF uses the past consumption method for drug quantification. This is because the method based on past consumption is simple and most reliable because of a stable prescribing practice. Drug supplies are generally available and it takes account of the uneven demands made on the health services and of actual prescribing practice. The quantity of each item is calculated as follows (Appendix 5) using a very simple spread sheet computer programme:

A. Average consumption per month: total drug delivered during the 12 months divided by 12;
B. Current stock;
C. Safety (buffer stock) : this is a two months stock which equal 2 X A;
D. Lead-time stock: it is the stock used in the interval between submitting an order and receiving the goods. RDF lead-time stock equal 3-month stock (3XA);
E. Reorder level: supply will be ordered when the stock of item reaches the 5-month (Fig. 5.1) anticipated consumption level (D+C);
F. Order quantity: usually RDF uses 6-month stock twice per year, (6XA);
G. Quantity to be ordered: this is equal to F+E-B.

Using only 6-month ordering assures rapid turnover of drugs which minimises storage and RDF capital requirements. This method proved to be efficient and stock surpluses and deficiencies are largely avoided.

Figure 5.1: RDF Stock Control Model



RDF identifies priorities by using the well-known ABC- analysis (2o / 80 per cent rule). The ABC-method classifies drugs of main RDF list (85 items) in decreasing order of cost of the volume consumed (Appendix 4) and places them in three categories: class A-items 10- 20% of the items usually accounting for 75- 80% of the fund. B-items another 10 –20% of the items represent 15- 20 % of the fund and C-items account for 60% to

80% of the items but only 5-10% of the value of the annual consumption. In 1999 the number of A-items is 21, B-class is 16 and 48 items in the C-class.

5.3.2 RDF Drug sources:

The main sources of RDF drugs, are a not- for profit organisation such as UNICEF, Missionpharma, IDA, ECHO and Amstelfarma. These are European brokers of generic drugs, which do have the specialised skills required and which use international competitive bidding. They are reasonable sources for smaller amounts of essential generic drugs.

The preference of the procurement from non-profitable sources has been emphasised by:

I. very low prices are usually offered by non-profitable suppliers compared to local manufacturers. For example, the 1998-drug order shows that only three items could be bought locally;
II. wide range of items which are not available to the local manufacturers;
III. drugs, pharmaceuticals and equipment offered by non-profitable suppliers are of proven quality.

However, their main drawbacks are:

I. they require payment in foreign exchange either upon delivery, or in some cases, upon placement of the order- the ability of the RDF to effect payment immediately is rewarded by excellent contract terms and payment offered by two suppliers-;
II. complexity of the procedures and lengthy of procurement period especially with UNICEF;
III. ongoing quality assurance and quality control procedures.

In some cases, purchase of locally produced drugs from a domestic manufacturing plants can be economically attractive especially if they compete with non-profit overseas suppliers. The advantages of local manufacturers comprise the payment in local currency, the communication and transport cost are much cheaper and there is no need for a quality test, since items are only tested before release.

In 1999, 78% of RDF drugs were from European suppliers of generic drugs (particularly Missionpharma), 12% from CMSPO and 10 % from local manufactures.

Minor supply shortages, which are caused mainly by delayed deliveries, and more recently by difficulties with custom clearance especially at Port Sudan, transfer of money to settle bills and quality control release, have up to now been speedily overcome by express orders of small quantities from CMSPO and local manufacturers.

Because they operate on a commercial base, the RDF people's pharmacies had purchased 84% of their drugs from the local representatives of the perspective manufacturers (i.e.brand products), in addition to the generic drugs from RDF (14%) and CMSPO (2%) (RDF Annual report 1999).

5.3.3 RDF Procurement strategies:

The procurement exercise remains one of the most concentrated activities on the RDF because out of stock of high priority drugs may result in costly local purchases from private suppliers (Appendix 9) and RDFs without a reliable source of low cost drugs have quickly ceased to revolve.

Using an independent procurement system, the RDF purchases drugs and other pharmaceutical supplies for use in the MoH health facilities much more quickly than through the usual governmental channels. Careful monitoring and management ensure that out of stock does not occur.

RDF drug purchases are made according to the financial procedures defined by the RDF management committee. There are three strategies of RDF procurement: direct purchase (from CMSPO), negotiated purchase mainly with local manufacturers and the main strategy is the procurement through closed (restricted) tender to a selected number of suppliers. The list of accepted suppliers is restricted to those known for their good reputation and it is subject to revision.

The advantages of selection of a limited number of suppliers are: its flexibility, speed and low transaction cost. Its disadvantage is that the supplier can abuse the buyers.

RDF does not exercise an open tender because:

I. in the open tender transaction the cost is very high;
II. there is a continual need to verify the quality of the drugs;
III. launching invitations to tender, awarding contracts and tenders reaching mutual agreements require much work;
IV. it is time consuming;
V. the source of drugs is continually changing (negative impact on prescribers and patients);
VI. it is risky if a batch of drug must be rejected and a further delivery cannot be made for sometime.

5.3.4 RDF Drug pricing policy:

5.3.4.1 RDF Drug pricing objective:

Unlike a commercial pharmaceutical distributor who must recover all of his expenses plus some profit, a publicly sponsored Revolving Drug Funds objective is not to maximise profits but to maximise service delivery at a certain basic quality level. Thus, the drug price adopted on the RDF is to ensure provision of affordable drugs, in comparison to the alternative sources i.e. private pharmacies.

5.3.4.2 RDF pricing strategy:

The RDF pricing system can be designed with the objective of recovering the cost by using any of the following strategies:

a) the first strategy: all costs, including payment of the capital investment, is relatively uncommon for RDFs. The RDFs are usually not required to repay the initial capital investment;
b) the second strategy: the selling price is taken to be equivalent to the actual cost of the drug purchase(direct cost) plus the operating costs, for example the RDF MoH-KS and the agence d`Approvisionnement despharmcies communitaires (AGAPCO) in Haiti (Peter, et al 1986);
c) the third strategy: selling prices are not exactly equal to the cost, there are three possible ways of establishing the selling prices as follows:

1. to recover the direct drug cost only: in this case the operating (distribution) cost paid by the ministry of health e.g. the RDF of the government of Dominica (Huff 1983). The advantage of this approach is that, it provides the revenue necessary to assure regular drug supply, while maintaining a relatively low cost to the patients. This approach also avoids administrative, accounting and sometimes legislative effort necessary to identify all operating costs and put them under one budget,
2. to collect only a portion of the direct drug cost and MoH subsidises the drug cost and pays full distribution costs. In this case RDF would continue to revolve only with a regular injection of drug procurement funds from the MoH budget;
3. the RDF selling price is adjusted above actual drug costs (i.e. direct drug cost plus operating cost), in order to provide money to finance other MoH activities such as, prevention, supporting health workers, health centres, or other parts of the health systems e.g. Bamako Initiative. The drawback of paying the health workers from drug sales is that they may make therapeutic decisions based on profit motives. In Afghanistan and Niger (Peter, et al 1986), for example, health workers were expected to mark-up the price of drugs enough to maintain their supplies and at the same time pay themselves a small salary. To prevent this, criteria for remuneration should be developed to assure both adequate income (fixed basic salaries) and reward for workload and work quantity.

The approach of drug cost plus surplus is possible if a RDF can purchase drugs at a lower price than competitors. For example, a public RDF may be able to buy its drugs from non-profitable generic suppliers such as UNICEF, IDA.. etc while private pharmacies must purchase brand-name drugs from private wholesalers. This allows Provincial Health Funds (PHFs) in the Cameroon to make a substantial mark-up (192%) on CIF import cost, while still charging the customers about 42% less than prices for comparable drugs charged by private pharmacies (Sauerborn, et al 1995).

5.3.4.3 RDF Pricing procedures:

The RDF, MoH-KS is not a cost recovery project by definition, but a revolving drug fund. This difference is important to bear in mind. It is also not a profit making (commercial) institution. Thus, each price review takes into account all of the cost

categories associated with maintaining the RDF: drug costs, operating costs and capitalisation costs. Political, social, health care and patient preference issues are also considered in the price setting process. Before setting a new price, the RDF makes a survey and collects data from private pharmacies, people's pharmacies and CMSPO to find out their drug charges. However, the result of the survey is interpreted in the light of differences in income level and perceived value of services (Appendix 6)

In general, there are different types of fees which can be charged, (each with different impacts on consumption pattern, ease of collection and accounting, and the balancing of drug costs and revenues). These fee types are:

- course of therapy: fixed fee for an episode of illness associated with standard treatment;
- prescription: standard fee per prescription;
- item fee: standard fee per drug;
- multi-level item fee: different standards of fee for different drug levels;
- variable item fee: fee differs with drug depending on type or cost.

The RDF KS uses the latter type i.e. variable item fee, because it is simple process, easy to control, reconciliation of cash against drugs sold is straightforward, there is ease of collection and accountability, it is difficult to be abused by pharmacy staff, convenient to patients, it is simple to perform a cross subsidy analysis and it is easy for RDF prices reviewers to calculate the required payment.

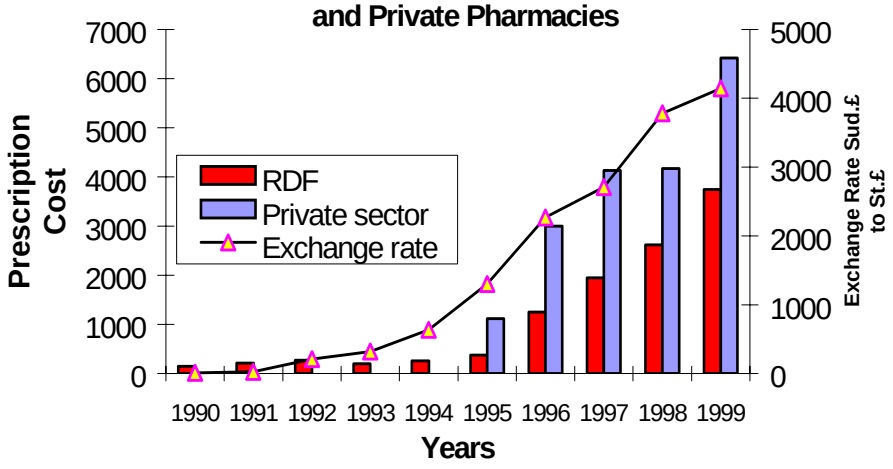
The RDF used to adjust its prices 2 to 3 times per year to reflect inflation. But in the last two years the prices were updated once per year due to a stable exchange rate of LS to US$.

The items unit prices are reduced by competitive bulk purchase of generic drugs from non-profitable suppliers and by increasing the sale volume. In spite of the 64% (Cameroon PHFs 192%) mark-up on cost CIF, generic drugs sold through the RDF are much cheaper (50 to 60% less expensive) than the equivalent brand-name sold by private pharmacies (Fig. 5.2)[*]. Part of this discrepancy is due to the fact that the private

[*] The private data for 1991 to 1994 is not available

sector pays import duties and taxes on brand-drugs. However, the main reason for the difference in the purchase cost of drugs is the high purchase price of brand name, retail package drugs compared to equivalent generic in large pack-purchased in bulk from non-profitable suppliers. The 64% mark-up is calculated to cover: operating costs (15%), 10% for recapitalisation of the lost capital in the early 1990s (during liberalisation of the Sudanese pounds), drug's loss (5%), drug price international increase (4%) and 30% to cover local inflation. The RDF list contains expensive drugs.
To justify the presence of such drugs, the cross subsidy policy established at the start of the project, is still applied. The mark-up on the cost of the expensive drugs with great health impact is subsidised by increasing that of the cheapest ones (e.g. insulin mark-up is minus 10%). Increasing the mark-up on cheaper fast moving drugs covers this loss.

Figure 5.2: Prescription Cost :Comparison between RDF and Private Pharmacies



That is, the 64% mark-up varies among items (some above others below), but the average is 64%. Appendix 6 shows the exercise of price review.

Usually the new price list is distributed to all RDF healthy facilities during one day (first day of the month) and the previous list is withdrawn. The stock at each health facility is recosted and a responsible pharmacist signs the new value of the stock. Before their implementation, the new prices must be approved by the RDF management committee.

5.3.4.4 Equity, Affordability and Exemption:

When designing cost recovery mechanisms in the public health system, questions of equity have to be taken into account, since poor households spend a significant portion of their income on drugs (Deferranti 1985). At the same time, the principle of price calculation based on health considerations has been proposed to bridge the gap between needs and affordability (Litvak, et al 1989). Since the RDF fees are intended to increase the availability of drugs at the health facilities, they must not serve as financial barriers to people receiving needed services. The RDF must improve total service, not decrease it. Although local solidarity funds fed by Zakat aid the poor as far as payment for drugs or user fees for health are concerned, 8% of the RDF patients were unable to pay the drug charges (Awadalkarim, et al 1996). The MoH launched a health insurance scheme (HIS) as a radical solution to the affordability problem. However, there is no data on patients` affordability after coverage of the poor households in KS by HIS. In other countries using cost recovery programmes, in Africa, only one (Zimbabwe) out of 25 countries had an official policy specifying national income ceiling criteria which would allow exemptions for poor. Fourteen other countries indicated that exemptions for indigent are permitted but did not provide criteria. The remaining ten countries relied primarily on local and ad hoc measures for providing exemption (Velasquez, et al 1998).

The kind of distinction in making cost recovery calculations allows for price-setting flexibility and cross-subsidies in favour of expensive but vital drugs. Another principle, which promotes equity, is the fact that retail prices in the Khartoum State RDF health facilities are uniform and independent of distance from the RDF warehouse.

Despite their attractiveness in theory in terms of equity, exemptions from RDF drugs` fee lead to losses, which may ultimately undermine viability, and in practice may also lead to abuse of the system by those who face the least problem of ability to pay. In addition to the difficulties of information and implementation exemptions are based on income. Easy-to-use reliable methods for determining exemptions in mechanisms charging user fees for drugs is not readily available. This is why there is no exemption on KS-RDF. However, the MoH-KS recognises that the user fees can be used to supplement government location for pharmaceuticals, but should not be used to replace

them. Bearing this in mind, the MoH provides drug required for some of the health support vertical programmes in collaboration with donors to handle highly prevalent contagious diseases such as acute respiratory tract infection (ARI), diarrhoea (e.g. oral rehydration salts), tuberculosis, and leprosy, PHC programmes such as family planning and immunisation programmes and the displaced people-free essential drug project. In addition to Free Emergency Drug List which contains items used at hospitals emergency units. The patients are given drugs from the list free of charge for the first twenty-four hours (the cost of these items is paid by the Ministry of Finance). The MoH also has "free care" emergency stock coping with the sudden upsurge in demand for drugs during an epidemic (e.g. during rainy season). To avoid the confusion of the health staff and patients, the free drugs are dispensed through a separate route.

5.3.4.5 Selling of RDF drugs:

a) RDF Health Facilities:

The RDF drugs are only sold to patients at MoH health facilities as a part of a health care transaction. This tight link to health care providers allows harmonisation of drug prescription ensuring that drugs form an integral part of patient care.

b) Dispensing procedure:

RDF drugs are dispensed only on prescription issued by authorised medical staff and solely against cash payment. In general, the prescription should fulfill the following criteria to be dispensed at RDF pharmacy:

- it should be a RDF or Health Insurance prescription (prescriptions from outside are not allowed);
- it should contain all the basic information on the patient such as Name, Sex, Residence ..etc;
- it should be stamped from the statistic office (to ensure that patient was registered);
- it should be attached with the consultation ticket (health centres only). This is not applied to Health Insurance patients and those who are exempted by the medical director.

After checking all above mentioned criteria, the pharmacist and/or assistant pharmacist, writes the drug price and directs the patient to the cashier. The cashier sums up all drug costs, collects the money and stamps the prescription after registration of the relevant data on the cash register book. Finally, the patient comes back to the dispenser to receive his/her medicine(s).

b) Non-RDF Health Facilities:

Ordinary revenues from drug sales at RDF health facilities do not assure the necessary increase of RDF capital for any further expansion resulting from coverage of a growing geographical area. But surpluses from extra ordinary services offered to non-members such as other states and federal hospitals, people's pharmacies and NGOs exceed this need by far more. The RDF surpluses which are made when the LS is stable are given to the MoH to disburse them for health related activities such as the malaria control programme.

5.4 RDF Distribution System:

5.4.1 Introduction:

The objective of distribution is to enable patients who need drugs to have access to them. This includes geographical, physical and economic access (Dumoulin, et al 1998).

- Geographical access: refers to the distance patients must travel to the nearest pharmacy. All RDF health facilities are within the walking distance (Awadalkarim, et al 1996). However, the geographical access must balance the extra cost of pharmacies serving small populations against the cost to those populations traveling to more distant pharmacies.
- Physical access: physical access refers to the availability of the stocks of drugs normally present in a pharmacy. The RDF manages to make essential drugs (98%) available at all its health facilities (Fundafunda 1998). In many developing countries, depletion of drug stock threatens the utilisation of health services.
- Economic access: the price of drug to patients depends on the cost of the drugs to the procurement system, the cost of distribution and the system of financing

consumption. Although the RDF selling price is 50 to 60% less expensive than private pharmacies (Fundafunda 1998), the accessibility to patients is 92% (Awadalkarim, et al 1996).

5.4.2 Drug storage management:

Drugs are fragile chemical substances and as such need special care and handling. They must be protected from excessive heat and moisture, from infestation by insects and other pests. The RDF stores were well constructed and designed to meet the WHO specifications for good drug storage.

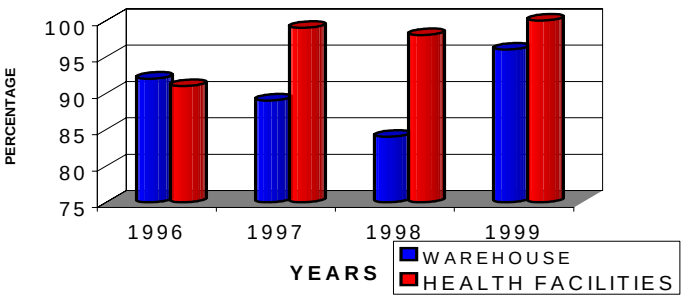
The drug stock is the responsibility of a well-trained pharmacist. Other staff include an assistant pharmacist, three store keepers, one cash collector, two computer operators, receptionist, 16 workers (mainly for delivery), 4 drivers and 4 watch men, in addition to a police night service.

The drugs are stored in a well-organised manner that enables ease inspection, recognition and retrieval of stock, and also allows free movement of drugs in and out of the store. A First-in First-out (FiFo) rule of dispatch system is applied (Awadalkarim et al 1996). Drugs with an earlier date of expiration are cleared first.

Stock management is done with combination of manual (stock record cards) and a computer programme. This provides a continuous record of each supply item in the stock and emphasises the importance of maintaining adequate levels of the products (drug availability at the warehouse was 96% during 1999 (Fig. 5.3).

The filed copies of drug-sold invoices and copies of suppliers` invoices are used to document the current stock. The RDF takes actual counts of stock on hand on a monthly basis, to check that the stock balance of the perpetual stock records is correct. The annual inventory is taken by a committee which consists of two pharmacists and two accountants from the RDF Head Office in addition to the warehouse staff.

FIGURE 5.3: RDF DRUG AVAILABILITY



5.4.3 Drug storage issues:

- Stock shortages: these occur because of inadequacies in the supply system, lack of foreign currency may limit a drugs` purchase, pharmacies may receive shipment without regard to levels of stock or consumption and in some cases the selling price may be too low to permit the stock to be replenished.
- Drugs are wasted during storage and distribution in 3 main ways:

1. They deteriorate due to poor storage condition (excessive heat, moisture, light..etc);
2. They expire due to poor needs or estimation of needs or poor stock control and management;
3. They disappear either through pilferage by employers, theft by outsiders who break-in, or are lost during distribution to the health facilities.

5.4.4 RDF Measures:

- Stock shortages: to avoid stock shortages, RDF has a safety stock i.e. two month stock. However, minor supply shortages are overcome by ordering small quantities from CMSOP;
- Drugs wastage: to ensure good storage conditions all warehouses have been refurbished, well ventilated and secured against fire and theft and three cold rooms have been installed. Drug expiration has never been experienced during the course of the last 5 years, because of the development of efficient needs of assessment and computer systems based on the past consumption data. The drugs disappearance through pilferage or theft have never been occurred at the warehouse level due to selection of competent staff, good management, security measures and monthly stock taking.

5.4.5 Stock Turnover:

Is the number of times that stock is required and released in the course of a year. The RDF stock turnover during 1999 was 2. For the RDF, which has limited funds, the more rapid the turnover, the less cash will be needed. Smaller stocks also require less storage space and are easy to manage (less expiration and losses). However, rapid stock turnover may increase total transaction costs, quality control cost and stock shortages.

5.4.6 Quality Assurance:

The quality of the products released to the public remains of the utmost importance to MoH. The RDF drugs are authorised for use through the same procedures that are used for the CMSPO. The quality assurance includes the use of the WHO certification scheme (e.g. GMP, free sale certificate, batch certificate ..etc). Upon receipt drugs undergo a further quality control test (in the National Quality Control and Drug Research Laboratories) before release to the public.

5.4.7 Drug delivery system:

Generally speaking there are three types of delivery route: circuit delivery (one vehicle supplies several consignees), used by the RDF-KS; linear delivery (one vehicle supplies only one consignee) and star delivery (parcels are dispatched to various consignees by hired carriers).

All health centres enrolled in the KS RDF operational system receive their regular supply deliveries from the RDF warehouse in Khartoum North on a scheduled monthly basis. The continual quantification by the health facility pharmacy responsible person (pharmacist or assistant pharmacist) for the unit consumption makes stock always available (drug availability is 100%) at health facility level (fig. 5.3). Delivery volumes for the RDF-HF are determined strictly by order, which the HF pharmacist or assistant pharmacist must give to the supervision team leader during the last week of every month (Appendix 7). The stock book is the backbone of the delivery process. The procedure avoid mistakes resulting from transcription and arbitrary changes and

guarantees sufficient lead time for delivery. It supports the RDF policy of consistently responding to demand.

To ensure even distribution to all health facilities and to avoid missed opportunities, quota delivered to the health facilities is sometimes adjusted according to stock quantities available.

The advantages of monthly delivery method also include:

1. Stocks can be replenished before they are exhausted;
2. Revision of drug orders at the RDF Head Office is made by a qualified pharmacist;
3. Scheduled delivery to the HF enforces routine supply and contributes to confidence in the entire RDF system;
4. Smaller amounts of stock and fund are required;
5. A more even spread of the workload over the time;
6. Supplies are replenished at scheduled intervals, saving administrative costs and transport time;
7. Few losses, because stock is delivered directly to the health facility.

Limitations of monthly delivery method are:

1. The responsible person must monitor its stock consumption;
2. Stock to be delivered must be ordered;
3. Deliveries of smaller quantities mean higher distribution cost.

The RDF maintain the delivery of drug order to all health centres (hospitals have their own vehicles to collect their orders) including those in the rural areas, using three trucks in addition to a small vehicle, which is usually used for communication and follow-up.

The drug delivery is still by a scheduled programme, as developed in the early stages of the project. Drugs are delivered with invoices of three copies to the HF. All deliveries are formally received, whether inside or outside working hours. The number of packages delivered is signed for by both receiving person and delivery team leader. After signing the three copies, the responsible person keeps one and other two copies are returned back by the delivery team leader to the warehouse and financial

department. A waybill (delivery note) which should be signed by the driver who makes deliveries and receiving person at the health facility is also used.

5.4.8 Drug transport to the RDF:

From 1988, the RDF was supplied with drugs by air, through Khartoum Airport. It was soon recognised that the shipment to the RDF was possible through Port Sudan. Since 1994, a number of items (about 95%) are received through Port Sudan, reducing the cost of freight from about 27% to 8 %. A few drugs and emergency items (e.g. cold chain items) are supplied by air to Khartoum airport.

5.4.9 Managing drugs at Health Facilities:

a) Stock control at health facilities:

Stock verification, at every location where supplies are stocked is planned to:

1. provide an additional form of evaluation that may reveal defects in the storing system;
2. maintain sufficient stock to last between deliveries;
3. maintain stock at the lowest possible cost.

Benefits of a successful stock control system at the health facilities:

Maintaining a sufficient stock of items at health facilities has many benefits: patients receive drugs promptly, and “stock-outs” are prevented even when deliveries are delayed. Patients have confidence in the health facility and seek help when they are ill. Above all, an effective stock control system keeps track of and ensures accountability for supplies.

b) stock inventory at health facilities:

Drugs are highly portable, easily concealed in clothing, and they have a high market value. The incentive to steal is great, and where there are no counter-balancing securing measures or penalties from infractions, it is not surprising that very high percentages of drug stocks are pilfered. Rigorous rules on management and accountability are the main remedy to ensure sustainability. This type of alertness minimises diversion of stocks and fraud of funds.

Deficits (bad debts) in the RDF cash collection in 1994 was 78 Million LS (appendix 1) this might be due to dispensing of drugs free of charges, selling drugs and keeping money in a pocket or pilfering of drugs. However, these losses have been practically eliminated after the introduction of the inventory at health facilities level. The HFs` stock is counted to find the actual amount of drugs sold during the last week (Appendix 8). This amount is cross-checked versus cash in the cashier's safe.

Advantages of stock inventory:

1. enforces procedures and regulations designed to prevent loss and wage;
2. ensures that security measures and records of received stock and dispensing of drugs are adequate;
3. controls cash collection by reconciliation of drugs sold and cash collected;
4. identifies and removes surplus, expired and obsolete stock;
5. stock taking at health facilities` level have tightened loopholes suspected of creating loss through leakage.

The consequences of implementing the new inventory system and employment policy have not only been an improvement in the area of the performance, but also on the reduction of level of stock losses. Previous to the handover (1996), the project operated as a loss-making entity. The stock losses at health facilities began to reduce from around 78 Million LS in 1994 and 1995 to 9 Million LS in 1996 and to NIL since the end of 1997 (Appendix 1).

5.4.10 Paying of drug orders:

All RDF health facilities receive their drugs order regardless of the payment. The payment to the RDF is through cash collection i.e. RDF sells drugs directly to the patients via its pharmacies in the HFs. The cash is collected by a supervisory team accountant on a weekly basis. The RDF cash collection measures introduced in 1996 succeeded in controlling revenues and reducing losses. These measures were based on the fact that the cash collected from the pharmacy must equal the value of drugs sold (Appendix 8).

5.5 Drug Utilisation (Uses):

5.5.1 Rational use of drugs:

Increasing the availability of drugs and enhancing their rational use are two interrelated aims (Kanji, et al 1992). Without essential drugs being available, their rational use cannot be achieved. This means not only that appropriate drugs are prescribed, but that they are available when needed at a price people can afford; that they are taken in the right dose, at the right intervals and for the right length of time and that they are effective and of acceptable quality. Thus, the main objective of prescribing is to encourage the rational use of drugs. “Rational use” means use in accordance with scientific knowledge to satisfy needs (Dumoulin, et al 1998). However, some instances of rational prescribing (higher doses, longer courses of treatment and use of powerful and expensive drugs) are more costly than others. If more costly drugs have the same therapeutic efficacy as less costly drugs in a given group of patients, the more expensive drugs are rational from a therapeutic perspective but irrational from an economic one for that group of patients. The rational use of the least expensive drug is the economical rational use. In Ghana, a pioneering studies found that if the prescriptions had followed the recommendations of the national health authorities, the cost of the drugs prescribed would have been reduced by 70% (Barnet, et al 1980). This indicated that any effort to improve the affordability, availability and quality of drugs should be accompanied by sustained efforts to improve the rational use of drugs. The measure of rational use indicators (Table 5.1) is the one of the supervisory teams’ activities.

The analysis of the finding has shown that the prescribing pattern is relatively irrational compared to the optimal values (Dumoulin, et al 1998) with regard to the number of drugs per prescription, use of generic name, average percentage of antibiotics and injectable forms consumed. The measurement of percentage of “antimalarials indicator” used by the RDF (because malaria is the major health problem in KS) found that their use can be considered consistent with the relative pattern of malaria (29%) in 1998.

Table 5.1: Rational Drug Use Indicators in the RDF Health Facilities

Indicators	Sudan	RDF-KS	Optimal Value
Prescription:			
Average Number of Drugs per Prescription	1.4	2.1	< 2
Percentage of Drug Prescribed:			
Under Generic Name	63	41	100
Containing Antibiotics	63	59	< 30
Administered by Injection	36	29	< 20
Belonging to the List of Essential Drugs	-	99	100
Containing Antimalarial	-	33	-
Patients Care :			
Average Length of Consultation	-	-	?
Average Duration of Dispensing	-	-	?
Percentage of Drugs:			
Effectively Dispensed	-	100	100
Correctly Labelled	-	100	100
Whose Dose is Correctly Understood by the Patient	-	-	100
Health Services:			
Percentage Availability of Essential drug List	-	100	100
Percentage Availability of Key Drugs (Appendix 10)	-	100	100

Training on the rational use and drug supply management was one of the objectives of the RDF. In this respect 93% and 7% (Awadalkarim, et al 1996) of assistant pharmacists responsible for pharmaceutical services attended courses on drug rational use and managing drug supply respectively. The rational use indicators showed that the health workers and especially prescribers at all levels of the health care system should be provided with continuous training and regular information. In addition, there is need for the development of school curricula on rational use and prescribing training.

5.5.2 Repackaging of drugs:

To save time for both staff and patients in the RDF pharmacies, it is a part of the RDF regulation to repack commonly dispensed oral medications (tablets and capsules) in appropriate quantities for standard treatment courses as on the RDF price list. This repackaging should be done at a quiet time (after or before working hours) to avoid mistakes in counting and labelling. Advantages of repackaging outside working hours are: allowing reliable dispensing of drugs, simplifying accounting procedures and often providing a substantial improvement over the haphazard dispensing from bulk containers in many dispensaries.

Chapter 6 RDF Financial System:

6.1 Financial Responsibility of the RDF-Manager:

After the handover in 1996, the MoH-KS appointed the RDF manager as the accounting officer for the RDF. His responsibilities as accounting officer included, his responsibility for the proprietary and regularity of the public finances for which he is answerable and for the keeping of proper records required for financial order. This is in addition to paying and collecting debts and ensuring the financial health of the RDF and co-ordinating the implementation of the Currency Swap Agreement with the SCF.

6.2 Financial Statement:

According to the financial order of 1995 the MoH-KS directed the RDF to prepare statements of accounts for each year. The accounts are prepared on an accruals basis and must give a true and fair view of the RDF`s state of affairs at the year-end.
In preparing the accounts the RDF is required to:

1. observe the accounts order direction issued by the Ministry of Finance KS, including the relevant account and disclosure requirements and apply suitable accounting policies on a consistent basis;
2. make judgements and estimates on a reasonable basis;
3. prepare financial statements every month.

6.3 Financial Records:

The RDF financial records include:

1. sales quantities and revenues by drug and type of health facilities (health centres, hospitals and warehouse). This information is used to assess the impact of the drug pricing policies and to more accurately predict future drug requirements;
2. regular trial balances and income statements provide periodic status reports on drug stocks and financial reserve. Such reports are vital to assure that the revenues are achieving or at least approaching cost recovery objectives, that cash flow is sufficient to procure new stock, and the stock is sufficient to fill expected demand.

6.4 RDF Bank Account:

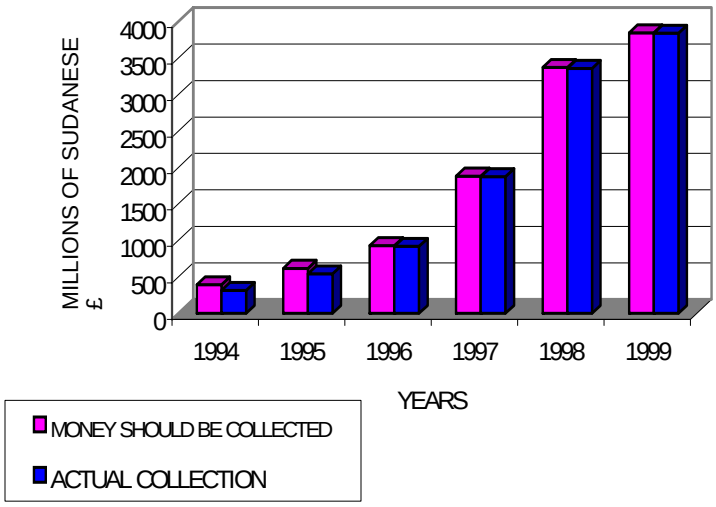
The law of the treasury requires that revenues earned by any arm of the government must be remitted to the state Ministry of Finance. According to the currency Swap Agreement between the MoH – KS and SCF (UK), the RDF has its own separate-accounts in both local and foreign (US$) currency and its revenues are entirely excluded from Ministry of Finance budget information.

6.5 Cash Collection:

The RDF cash collection of drug sales at health facilities is based on the answering the question of how much money should have been, and how much money actually was collected? A high collection rate depends on a sound drug management system.

In 1994, the RDF started, for the first time, an inventory system on a monthly basis to reconcile the cash collection with the sold drug. However, this approach failed to prevent the deficit in cash collected against sold drugs. In 1996, the RDF introduced a new employment and cash collection policy. As a result of this policy all RDF pharmacy staff signed a contract with the RDF Head Office. According to the contract, the pharmacy staff with a supervision team conduct a stock inventory on a weekly basis. The cash collected by the supervision team must match with the drugs that had been sold during the week (Appendix 8). Any deficit should be paid by the responsible pharmacist within one week. The cash collection system, in addition to accountability measures, regular supervision and vigorous use of disciplinary and legal measures results in a high efficiency of cash collection and the entire elimination of a deficit (Fig.6.1)

Figure 6.1: RDF-RECONCILIATION



6.5.1 Health Insurance Payment:

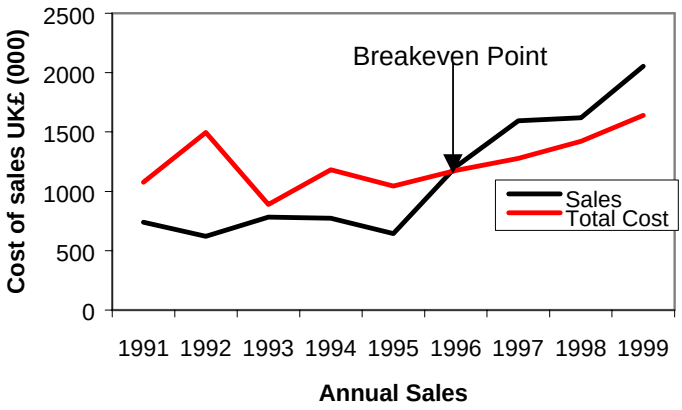
The RDF supplies drugs to the Health Insurance patients for 25% of the prescription cost at health facilities level. The remaining 75% (equivalent to 32% of the total RDF revenues) is paid to the RDF by the HIS on a monthly basis. The supervision team accountants collect all HIS prescriptions from the health facilities and fill requisition form and submit it with the prescriptions to the HIS financial department, which in turn checks them and reimburses the RDF. Sometimes, the availability of liquidity at HIS delays the RDF reimbursement.

6.6 Financial Status of the RDF (1991- 1999):

6.6.1 The Profit and Loss Account:

The records show a steady increase in the level of sales and cost of sales. The mark-up on the cost has ranged from 13% in 1991 to 64% in 1999 (Appendix 1). Significantly, the fund moved from operating at a loss-making project (1991-1995), to one which realises a surplus from 1996 (Fig. 6.2). The devaluation in 1998 (40%) has chopped the net trading profit. The stability of Sudanese pounds (LS) against UK£ and the increase of sales especially to those outside the RDF are the limiting factors that make the RDF operates at a profit (Table 6.1).

Figure 6.2: RDF Breakeven Point



6.6.2 Balance Sheet:

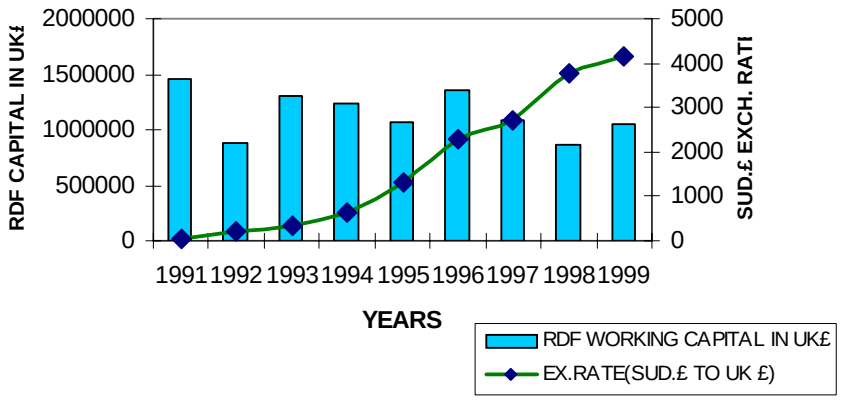
The balance sheet is used to show the financial position of the RDF every month. The seed stock for the RDF capitalisation provided by the SCF in the form of drugs that arrived in separate consignments since 1989 was completed in early 1992 (UK£ 1.8 million). However, the 1992 Sudanese pound liberalisation resulted in substantial (723%) devaluation (Table 6.1). Due to the presence of the RDF revenues generated from drug sales from the beginning of the project in 1989, in Sudanese pounds, the RDF suffered the first major decapitalisation in 1992 and the working capital was reduced by 53% (Fig. 6.3). For comparison: after the 50% devaluation, the Central Medical supply Organisations of the West Africa states were practically deprived of liquidity (essentially equivalent to bankruptcy) and had to ask the donor community for new capital investments (Massow, et al 1998). After the 1992 devaluation the MoH and SCF signed what is known as the Currency Swap Agreement (details may be found on the section discussing foreign currency requirement).

In spite of continuous devaluation (Table 6.1) and the payment of all operating costs from the project after the handover, the working capital of the RDF (Appendix 1) has slight increase in value from UK£ 0.9 Million in 1992 to UK£ 1.1 in 1999.

Table 6.1: Sudanese pounds Devaluation 1989-1999

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
LS to UK £	7.2	8.5	25.5	209.9	318.0	637.0	1305.0	2268.0	2709.0	3782.0	4143.0
Yearly % Increase		18%	200%	723%	52%	100%	105%	74%	19%	40%	10%
Devaluation %		18%	254%	2815%	4317%	8747%	18025%	31400%	37525%	52428%	57442%

FIGURE6.3: EFFECTS OF DEVALUATION ON THE RDF WORKING CAPITAL



6.6.3 RDF Expenses:

a) Operating Expenses:

Keeping the operating expenses of the system to a minimum has been the key prerequisite to the implementation of the RDF where fees should be affordable for the patients.

The operating cost (Appendix 1) can be divided between fixed and variable costs. Administrative incentives, electricity and communications are usually relatively fixed. Transportation, demurrage, insurance, bank charges and supplies will vary depending on the volume of drugs being handled.

Previous to the handover (1996), SCF (UK) undertook to pay for certain cost lines of the fund. For example, transport, fuel, maintenance of vehicles were all paid for by the SCF (UK). With the handover, the project has taken on all these costs reflected in the increase in expenditure. Records show that the volume of expenses had increased significantly in 1994 and 1995 (22% and 24%) due to bad debts at health facilities. Prior

to 1994, expenditure was in the range of 1 to 4% of the sales (1991-1993) and bad debts at health facilities were unknown (inventory at HF started in September 1994) and the major expenses were mainly met by the SCF. Currently, since 1996 expenditure is in the range of 8 to 12%.

b) Capitalisation Costs:

Other than the capital fund for initially stocking the system (Working Capital), capitalisation or development costs (indicated under other expenses in Profit-Loss Account) include the costs of designing and planning the system, construction renovation of office and warehouse space, purchase of vehicles and equipment and the support of other health facilities.

6.7 Foreign Currency Requirement:

Foreign exchange is an extremely important issue that requires support and co-operation from government groups outside the health sector (Ministry of Finance and central Bank) where local currency is not freely convertible and demand for foreign exchange exceeds supply. This was the situation in Sudan in early 1990s.

From 1992, the RDF operated a system to provide foreign currency necessary to replenish drug stock on a regular basis. This system was formalised as the Currency Swap Agreement, signed between the Government of Sudan (through the Federal Ministry of Finance and Economic Planning and the Ministry of Health of Khartoum State) and the Save the Children Fund (UK) in April 1992. This agreement reflects the commitment of the Government to the RDF. According to this agreement, all local funds collected from health facilities prescription sell and set aside for drug overseas procurement are swapped for the equivalent foreign currency allocation at the SCF (UK)- Sudan Office. This foreign currency (Sterling) goes into the RDF foreign currency account at the local bank. Payment to overseas suppliers is through irrevocable letter of credit (some suppliers offer the payment by direct transfer two months after receiving of goods). In the past, up to 1996, SCF (UK) –London provided a RDF account at its office, which was used to pay overseas suppliers. The Currency Swap

Agreement is still in effect, being renewed every December. The agreement has helped the RDF-KS to pass safely through its hardship period (1989-1999). Now, there are other alternatives available for the RDF especially after the oil exportation in 1999. The RDF will use these sources when necessary.

The devaluation of the Sudanese pound (Table 6.1) during 1991 jumped to 200% and shot up to 723% in 1992, resulted in the first major decapitalisation of the fund, the second minor decapitalisation occurred in 1998 when the devaluation jumped from 19% in 1997 (working capital UK£ 1.1 Million) to 40% in 1998 (a working capital fall to UK£ 0.9 Million).

6.8 RDF Threatening Factors:

Revolving Drugs Funds have been established in Peru, Guatemala, India, Bolivia, Haiti, Senegal, Niger, Afghanistan, Mali, Indonesia, Thailand and else where. The establishment and/or maintenance of many of these programmes has been fraught with difficulties (Peter, et al 1986).

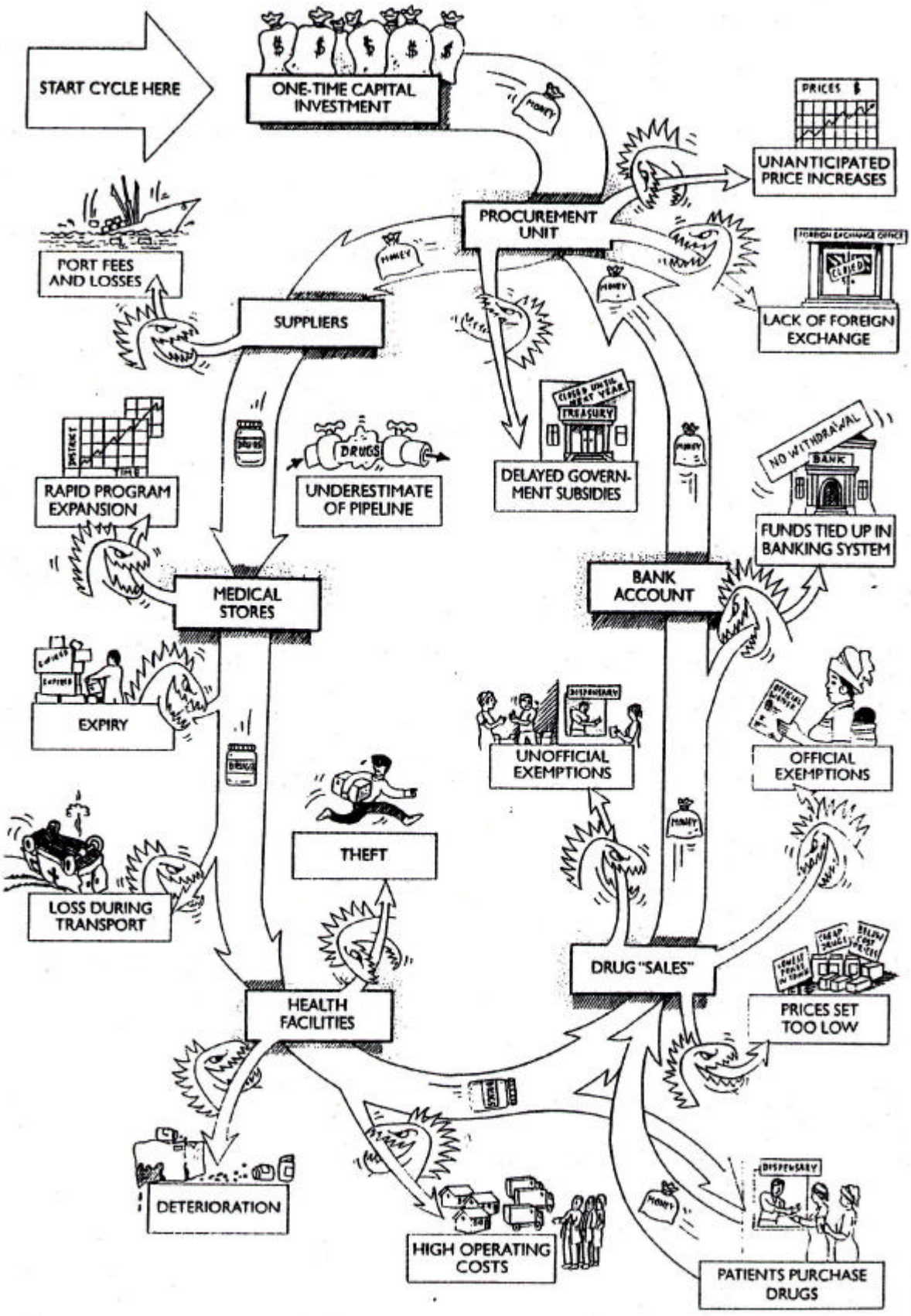
6.8.1 Causes for Loss of Available Funds:

The following factors (Fig. 6.4) too often make RDFs fail to generate sufficient revenues to replenish their stocks and, in effect, soon cease to revolve. These factors are:

1. Business Orientation: many factors contribute to the failure of RDFs, one of the most important appears to be a resistance to thinking of the fund in business terms and, in particular, a lack of careful economic and financial analysis in planning the fund;

2. Community Non-compliance: community participation in the RDF is essential. For example the Gosses, Senegal revolving fund for a vaccination programme failed to revolve when villagers proved unwilling to pay for the entire series of vaccinations and the revenues were insufficient to replenish health workers supplies (Peter, et al 1986);

Figure 6.4: RDF Cycle of terrors
Source: Managing Drug Supply (1997) 2nd edition



3. Rapid Programme Expansion: for which additional capital funds are not made available. For example in Montero, Bolivia, a regional RDF began selling drugs in August 1976 and expanded rapidly. By May 1979, drug supplies at the central level were depleted (Peter, et al 1986), there were insufficient funds to procure additional supplies, and the drug sales programme was at standstill. This is why KS-RDF was implemented over a relatively long period;

4. Under-estimation of the Capitalisation cost: the cost of the supply system should be planned for and the operating cost should be closely monitored;

5. Unanticipated losses of the drugs: the losses of drugs and cash through theft or deterioration or unauthorised exemption commonly lead to RDFs failure. The measures of KS-RDF proved to be effective. Over the years (1989-1999), the protective alertness and control system resulted in average losses of only 3% from pilferage and expiry;

6. High operating costs: may cause fund depletion. To keep the operating costs under control KS-RDF uses a monthly profit-loss account which allows immediate intervention decision when necessary;

7. Prices set too low for intended level of cost recovery: the pricing system is important exercise on the RDF-KS, and the prices are updated regularly to cope with the local currency devaluation ;

8. Failure to Collect payment for Drugs with no subsidy system: RDF in the Khartoum State has gained full independence from subsidies, exemption and external authorities. Its cash collections have been substantially improved (Fig. 6.1) in the past four years. Rigid financial planning must not however be undermined by other projects that offer generous subsidies;

9. Delays in collection of subsidies and other payment from government agencies: the policy of the RDF-KS is cash for drugs. The drugs in the RDF are sold on a prescription basis in all RDF health facilities. However, the Health Insurance

Scheme is the only governmental organisation that pays RDF on a monthly basis. The RDF committee gives the reimbursement of the RDF high priority;

10. Funds Tied-up to national banking systems or ministry accounting mechanisms: the MoH-KS made RDF an autonomous agency, which has its own account and with full authority to use the RDF revenues generated from the drug sales to replenish stock and pay the operating expenses;

11. Unanticipated price increases from inflation or charges parity rates: all patients who seek treatment at RDF pharmacy have to pay the prescription according to declared prices. The regular price adjustment has allowed RDF-KS to operate successfully since 1989;

12. Foreign Exchange: the foreign exchange restricts foreign purchases for resupply of used stocks. The Currency Swap Agreement, local purchases and liberalisation of foreign exchange market have greatly improved the RDF situation.

Chapter 7 Achievements and Shortcomings

7.1 Achievements:

1. Drug availability: as a result of a good operating system, the RDF ensures a continuous supply of good quality essential drugs at affordable prices in MoH KS health facilities. Drug availability is improved, and essential and other drugs have been continuously available to the participating health facilities since the launching of the project. Table 7.1 illustrates the availability of drugs at RDF health facilities during 1996 –1999.

Table 7.1: Percentage of Drug Availability at RDF Health Facilities (1996-1999)

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Average
1996	80	86	78	99	98	99	98	98	96	98	99	100	91
1997	99	99	98	100	100	99	97	97	96	98	99	100	100
1998	100	99	100	99	98	99	99	99	96	94	99	99	98
1999	100	100	100	100	100	100	100	100	100	100	100	100	100

Impact of drug availability at the RDF health facilities:

- the moral of staff has improved significantly because they have essential drugs to work with;
- improving the drug availability increases the quality and utilisation of health services;
- the continuous availability of affordable drugs from the RDF has resulted in a beneficial moral obligation of the prescribers to adhere to the fund items (99% of the prescribed drugs are from the RDF list) (Table 5.1);
- the availability of an affordable supply of quality drugs has had a large impact on the credibility and effectiveness of health services.

2. Geographical coverage: most of the population of Khartoum State have an RDF facility reasonably close and within walking distance. Before the RDF, travel and time costs involved in seeking alternative sources of care were high. When drugs became available at local HFs, the fees paid represented an effective reduction in the price of care.

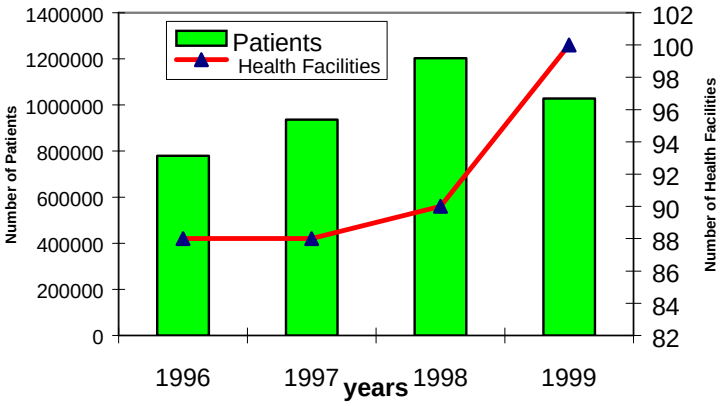
3. Health service utilisation: use of health facilities increased significantly for people in RDF areas compared with those in which the RDF had not been implemented. The provision of good quality essential drugs at reasonable prices through RDF, as well as other contributions have resulted in the availability of the PHC services directed to improve children's health to variable degrees (Awadalkarim, et al 1996).

4. Low income households: since the poor are most responsive to price changes, they appear to be benefiting more than others from local availability of affordable high quality drugs. This is particularly true if accessing the next best care alternative involves significant time and travel costs.

5. Confidence in the public health facilities: the RDF continuous supply of drugs has had a profound effect in regaining the confidence of the population served in their health facilities. This in turn helped in increasing the utilisation rates for promotive and preventive services (Awadalkarim, et al 1996).

In the last two years (1998 and 1999) a total of 4,677,038 people have been provided with drugs in 79 health centres, 16 hospitals and 13 people's pharmacies supplied by the RDF. Among them 1,112,659 utilised the Health Insurance Scheme (Fig. 7.1)

Figure 7.1: Patients visited RDF`s HFs 1996-1999



6. Self sustainable: in spite of the devaluation in 1992, the RDF is still having almost the same working capital since 1991 and it manages to maintain a continuous drug supply to the MoH KS health facilities without asking for more funds.

7. Drug manufacture: MoH has joined forces with a private pharmaceutical company to set the manufacture of most needed and essential drugs. MoH is a shareholder, with the surplus of RDF revenues allocated for different activities of the MoH. The production of tablets started in early 1999.

8. Integration between RDF and other MoH programmes: as a part of the integration between different programmes within the MoH and due to its experience in procurement, other programmes` needs are purchased through the RDF procurement system.

7.2 Success Factors:

1. Political commitment: political and social support has been a factor for the success of the project. Much motivation has been presented for the RDF to succeed, by way of reference to it and its success, at the highest levels of government. This support and its publication has also resulted in an acute demand for RDF services by communities without this project. The Government also provides RDF drugs and pharmaceutical items customs, tax and import licences exemption.

2. Hard currency availability: the availability of hard currency through Currency Swap Agreement is the corner stone in the RDF success.

3. RDF management: the achievements of the RDF are attributed to its small, flexible structure, which combines social objectives with private style management. Key factors for success has been financial autonomy, funding from cash sales, small staff (at RDF Head Office) selected for their competence and the private sector approach to personnel accountability, financial and drug supply management. This is in addition to a realistic operating cost budget, strong leadership and effective supervision. Credit should also go to SCF (UK) which helped establish an operational system of health care management that would not totally be dependent on external intervention.

4. The community willingness: the community's perception that affordable and acceptable essential drugs of good quality are continuously available at health facilities has stimulated its purchasing power. This increases sales volume which makes the RDF replenish a system which develops, strengthens, extends to become more responsive and reliable.

7.3 RDF Shortcomings:

1. Those who are unable to pay for drugs will be discouraged from Primary Health Care. This will increase the problem on the poor rather than welfare.

2. The evaluation of the RDF has shown that the 8% of the prescriptions were not dispensed due to the fact that the patients were not able to pay for the prescription.

3. The programme was unable to organise community participation and involvement of the facility health committees in its activities.

4. It was also unable to recruit enough pharmacy staff of the required quality for service delivery at health facilities.

7.4 Other RDF Experiences from Abroad:

1. Health service utilisation: in Cameroon, the establishment of a RDF has lead to significantly higher rate of utilisation and the poorest benefited most from the local availability of effective drugs (Peter, et al 1986). Other experiences, notably in Benin, Guinea and Mauritania, also show that the demand for community health services which have user fees does seem to increase if quality, as measured by availability of drugs, also increases (Peter and Knippenberg 1991).

2. Low RDF Revenues: the studies in 17 Sub-Saharan African countries (Benin, Chad, Niger, Sierra Leon and Zaire are some examples) that operate community drug funds, have shown that the success rate for the recovery of funds was about 50% (Show and Ainsworth 1996).

3. RDF managed by community: in Southeast Asia the most famous RDF project is in Thailand, where the RDF undertaken by villagers is found all over the country (Swibulpolprasert 1991).

4. Control of RDF drug sales: experiences of Central Africa Republic indicates that health centres which were self-managed, controlled their own sales and had fees for all services, had higher cost-recovery rates than centres which did not exert as much control over drug sales and offered a range of free services (Show and Ainsworth 1996).

5. Drug availability and accessibility: in Nepal several experimental programmes on cost sharing have been implemented and some are more successful than others. An insurance programme (the United Missions to Nepal Scheme) showed the best performance in improving drug availability and accessibility (WHO 1997).

6. Inflation problem: inflation is the main problem, which threatens the Revolving Drug Funds. One scheme in Zaire had innovative and seemingly successful solutions to the problems of inflation and frequent devaluation. As soon as programme had enough money, it bought cattle. When it was time to buy more drugs, the cattle were sold. This meant that assets were not held in cash, which tended to lose real values, but in the form of the live stock, which generally kept a constant real value (Waddington, et al 1991)

Chapter 8 Conclusion and Recommendations:

8.1 Recommendations:

1. Monitoring system: monitoring and evaluation of the RDF on a regular basis is essential to determine the success of the programme. Particular attention should be paid to adverse consequences, such as reduction in utilisation of the programme and revenue collection administration.

2. Rational use of drugs: the prescribers and users show some serious features of irrational use of drugs. Training and education, provision of information and communication programmes to improve practice should be considered by the KS-MoH.

3. Operating expenses: Ways will have to be found to reduce the current expenditure list, or to reduce the cost of each line. For example, bank charges, demurrage, drug testing cost could all be addressed, since the fund is being charged commercial rates, when it is not a commercial entity.

4. Recruitment of pharmacists: Although, there was no qualified pharmacist at health centres and rural hospitals, pharmacy management at these levels is fairly good (Awadalkarim, et al 1996). However, this needs review and further attention to the issues regarding drug supply management, counselling of the patients, and better utilisation of the service by public. This can only be achieved by recruiting qualified pharmacists.

5. Poor patients: provision for patients unable to pay for RDF drugs must be strengthened, for example through community involvement.

6. Training of staff: the success of staff training has been proven by present achievements. However, little training is done; this line of activity is strongly recommended to be improved.

7. Drug pricing: it is recognised that the drug prices can be kept only so low, a level below which it would prove uneconomical to run a RDF. It is therefore necessary to reflect on the cost of other services on offer, when reviewing drug prices. Means must be found to address this, and demonstrate that those unable to pay will not become progressively marginalised, as more services become fee-paying.

8. Staff incentives: the incentives of staff operating the RDF should be updated if the trained staff are to be kept.

9. Community participation: increasing PHC targets will necessarily demand the participation and involvement of service users. The RDF needs to develop ways to include the community in its structure.

10. Computerisation of stock management: presently the stock management is partially computerised requiring much manual input for data feeding. It is recommended that the complete software to be developed which should include Bar code scanning facilities. The software should be developed based on the principle of existing semi-manual system. The personnel working in the unit should be trained for the software and there should be alternative procedure to fall back whenever the system breakdown. Annual budget should include annual maintenance cost.

8.2 Conclusion:

The RDF-KS is a demonstration of the success of collaboration between NGO (SCF-UK) and recipient institution (MoH-KS), and the justification for, and benefit of an NGO working within the recipient institutional structure. It can thus be stated that the RDF has supported the restructuring of health services and fulfilled its objectives: a constant supply of essential drugs have kept a wide section of the population away from self medication and questionable drugs, from flying hawkers or from high expensive brand medicine pharmacies; a more rational use of quality drugs, rising attendance rates at public health services. The project also leads to better utilisation of the PHC. However, careful considerations to prevent negative consequences of the RDF such as disincentives for the poor to join the programme, inappropriate exemption policies,

uneconomical behaviour and political interference, decapitalisation of the programme and inefficiencies in revenue collection are needed.

In spite of these documented successes, the RDF remains vulnerable to forces outside its control. Such forces include the unfavourable exchange rate, the pressing economic environment and federal policies and regulations of drug importation.

Innovative use of funds and application of a strict employment contract in the public sector institution may be considered unconventional and unwelcome, as a means of achieving certain needs. However, it is demonstrated in the RDF that this is possible, and therefor not alien to the public sector.

Keeping within a progressive operational framework will maintain current success and guarantee future improvement in the RDF.

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APPENDICES

APPENDIX 1

FINANCIAL STATEMENTS
PERIOD 1991- 1999

PROFIT AND LOSS ACCOUNT (X1000)

YEARS	1991		1992		1993		1994		1995		1996		1997		1998		1999	
EX.RATE LS TO UK£	25.5		209.0		319		637		1305		2268		2709		3782		4143	
	LS	UK£	LS	UK£	LS	UK£	LS	UK£	LS	UK£	LS	UK£	LS	UK£	LS	UK£	LS	UK£
SALES	18896	741	129580	620	249777	783	492401	773	840420	644	2742012	1209	4318146	1594	6126840	1620	8505579	2053
COST OF SALES	16779	658	95304	456	187253	587	335062	526	533745	409	1986768	876	2950101	1089	3846294	1017	5182893	1251
GROSS MARGIN	2117	83	34276	164	62524	196	157339	247	306675	235	755244	333	1368045	505	2280546	603	3322686	802
% MARK-UP ON COST	13	13	36	36	33	33	47	47	57	57	38	38	46	46	59	59	64	64
%MARK-UP ON SALES	11	11	26	26	25	25	32	32	36	36	28	28	32	32	37	37	39	39
EXPENSES:																		
OPERATING EXPENSES	153	6	204	8	714	28	1046	41	1071	42	1989	78	3366	132	4463	175	6554	257
BAD DEBT WRITE-OFF	0	0	0	0	0	0	3137	123	1479	58	102	4	459	18	0	0	0	0
STOCK WRITE-OFF	0	0	26	1	0	0	153	6	510	20	153	6	0	0	51	2	51	2
TOTAL EXPENSES	153	6	230	9	714	28	4335	170	3060	120	2244	88	3825	150	4514	177	6605	259
NET MARGIN	1964	77	34047	155	61810	168	153004	77	303615	115	753000	245	1364220	355	2276033	426	3316082	543
OTHER INCOME (EXPENSES)	0	0	0	0	0	0	-26	-1	-1326	-52	0	0	-6554	-257	-9231	-362	-7217	-283
EXCHANGE ADJUSTMENT	-10557	-414	-26265	-1030	-6962	-273	-12368	-485	-13133	-515	-5228	-205	-1428	-56	-5840	-229	-3417	-134
NET RESULT PROFIT/ (LOSS)	-8594	-337	7782	-875	54849	-105	140611	-409	289157	-452	747773	40	1356239	42	2260962	-165	3305448	126

Continue

BALANCE SHEET(X1000)

YEARS	1991		1992		1993		1994		1995		1996		1997		1998		1999	
EX.RATE LS TO UK£	25.5		209.0		319		637		1305		2268		2709		3782		4143	
	LS	UK£	LS	UK£	LS	UK£	LS	UK£	LS	UK£	LS	UK£	LS	UK£	LS	UK£	LS	UK£
ASSETS:																		
CASH AT BANK	31085	1219	627	3	14036	44	40131	63	83520	64	451332	199	552636	204	26474	7	41430	10
STOCK	1020	40	102201	489	105589	331	264992	416	853470	654	1637496	722	1248849	461	2167086	573	3562980	860
DEBTORS	5534	217	28424	136	63481	199	98098	154	223155	171	494424	218	1097145	405	1009794	267	1247043	301
PREPAYMENTS	0	0	23408	112	0	0	7007	11	6525	5	142884	63	205884	76	117242	31	0	0
DEPOSITE ACCOUNT	536	21	627	3	638	2	637	1	1305	1	401436	177	0	0	0	0	0	0
SCF-UK	0	0	27588	132	231594	726	383474	602	266220	204	40824	18	0	0	98332	26	0	0
LOANS AND ADVANCE	0	0	0	0	0	0	15288	24	0	0	2268	1	8127	3	3782	1	4143	1
TOTAL ASSETS	38174	1497	182875	875	415338	1302	809627	1271	1434195	1099	3170664	1398	3112641	1149	3422710	905	4855596	1172
Less:																		
LIABILITIES:																		
CREDITORS	969	38	0	0	638	2	16562	26	16965	13	79380	35	170667	63	162626	43	509589	123
REAGENTS	26	1	0	0	638	2	637	1	30015	23	0	0	0	0	0	0	0	0
SUNDRY ACCRUALS	0	0	0	0	0	0	637	1	1305	1	0	0	0	0	0	0	0	0
TOTAL LIBILITIES	995	39	0	0	1276	4	17836	28	48285	37	79380	35	170667	63	162626	43	509589	123
TOTAL CAPITAL EMPLOYED	37179	1458	182875	875	414062	1298	791791	1243	1385910	1062	3091284	1363	2941974	1086	3260084	862	4346007	1049
REPRESENTED BY:																		
SCF (UK) INITIAL CAPITAL	45620	1789	373901	1789	639276	2004	1276548	2004	2416860	1852	4200336	1852	5017068	1852	7004264	1852	7672836	1852
COMULATIVE TRADING PROFIT	2321	91	34694	166	88044	276	137592	216	262305	201	537516	237	113778	42	-624030	-165	-2771667	-669
COMULATIVE EXCHANGE GAIN (LO	-10761	-422	-225720	-1080	-313258	-982	-622349	-977	-1293255	-991	-1646568	-726	-2188872	-808	-3120150	-825	-555162	-134
TOTAL CAPITAL EMPLOYED	37179	1458	182875	875	414062	1298	791791	1243	1385910	1062	3091284	1363	2941974	1086	3260084	862	4346007	1049

Continue

RDF EXPENSES SUMMARY (X 000)

YEAR		**1991**		**1992**		**1993**		***1994***		**1995**		**1996**		**1997**		**1998**		**1999**
EX. RATE LS TO UK£		**25.5**		**209.0**		**319**		***637***		**1305**		**2268**		**2709**		**3782**		**4143**
	LS	**UK£**	**LS**	**UK£**	**LS**	**UK£**	**LS**	***UK£***	**LS**	**UK£**	**LS**	**UK£**	**LS**	**UK£**	**LS**	**UK£**	**LS**	**UK£**
Incentives	153	6	836	4	3509	11	11466	*18*	20880	16	56700	25	121905	45	230702	61	418443	101
prescription bad	-	-	-	-	3828	12	7007	*11*	7830	6	0	0	2709	1	34038	9	33144	8
Stationary	-	-	-	-	957	3	1911	*3*	6525	5	9072	4	29799	11	15128	4	8286	2
Transport/fuel	-	-	-	-	638	2	3185	*5*	5220	4	24948	11	27090	10	52948	14	87003	21
Bank charges	-	-	-	-	-	-	0	*0*	0	0	2268	1	5418	2	68076	18	0	0
Security	-	-	-	-	-	-	637	*1*	1305	1	0	0	0	0	0	0	0	0
Insurance	-	-	-	-	-	-	0	*0*	1305	1	6804	3	5418	2	11346	3	29001	7
Refurbish- offices	-	-	-	-	-	-	1274	*2*	3915	3	0	0	0	0	0	0	0	0
Machinery and Equipment	-	-	-	-	-	-	1274	*2*	0	0	0	0	40635	15	68076	18	58002	14
Repair and Maintenance	-	-	-	-	-	-	0	*0*	0	0	47628	21	0	0	0	0	0	0
Stock Losses (write-off)	-	-	209	1	0	0	3822	*6*	26100	20	18144	8	0	0	7564	2	8286	2
Donations	-	-	1045	5	0	0	0	*0*	3915	3	0	0	48762	18	22692	6	24858	6
Bad Debts	?	?	?	?	?	?	78351	*123*	75690	58	9072	4	0	0	0	0	0	0
Demurrage	-	-	-	-	-	-	-	-	1305	1	31752	14	89397	33	94550	25	227865	55
Drug testing	-	-	-	-	-	-	-	-	1305	1	2268	1	2709	1	3782	1	12429	3
Measuring Spoons	-	-	-	-	-	-	-	-	1305	1	0	0	0	0	0	0	0	0
Loans	-	-	-	-	-	-	-	-	0	0	2268	1	0	0	3782	1	8286	2
Computers	-	-	-	-	-	-	-	-	0	0	2268	1	0	0	0	0	8286	2
Telephone Charges	-	-	-	-	-	-	-	-	0	0	0	0	16254	6	15128	4	37287	9
Miscellaneous	-	-	-	-	319	1	0	*0*	0	0	2268	1	16254	6	41602	11	111861	27
Total Expenses	153	6	2090	10	9251	29	108927	*171*	156600	120	215460	95	406350	150	669414	177	1073037	259

- The cost was paid by SCF from RDF Support Fund
? No check for cash against drugs sold until 1994

Appendix 2

Revolving Drug Fund

Ministry of Health - Khartoum State
(Drug Withdrawing Form)

Province…………………Date………………….Health Facility………………………..

No.	Item Description	Quantity withdrawn			Total Quantity	Unit	Unit Price	Total Value
		Surplus	Damage	Expiry				
Total Value								

Medical Director………………Signature…………….Pharmacist……………..Signature…………….

Supervision Leader……………Signature……….Super. Accountant…………….Signature…………..

Appendix 3

Revolving Drug Fund
Ministry of Health –Khartoum State
Daily Supervision Checklist

Supervision Team Leader……Signature……..……Date……

Healthy Facility Number	1	2	3	4
Health Facility Name				
Time of Visit				
Attendance of Staff				
Number of Prescription without consultation ticket				
Number of Patients (Previous Day)				

Item	A	N	A	N	A	N	A	N
Amoxycillin Capsules.								
Amoxycillin Susp.								
Chloroquine Inj.								
Chloroquine Syrup								
Chloroquine Tablets								
Cotrimoxazole Sus.								
Cotrimoxazole Tablets								
Ferrous + Folic Acid Tablets								
Hyoscine Tablets								
Paracetamol Syrup								
Paracetamol Tablets								
Penicilline Crystalline								
Promethazine inj.								
Promethazine Syrup								
PromethazineTablets								
I.V. Fluids								

A = Available. N = Not Available.

Actions Taken:
1-……2-…….
3-……4-…….
5-……6-……

Continue..

Health Facility Number	1		2		3		4	
Checked Item	Yes	No	Yes	No	Yes	No	Yes	No
All drug with 6-month shelf life have been withdrawn from stock								
Damage and expired drug present								
Proper repackaging of tablets and capsules								
Labelling on dispensing bags for repacked medicines								
Presence of daily record of dispensed medicines								
Sales and prescription detail of the dispensed medicines								
Reconciliation of quantity of drugs versus cash collected								
Presence of excess stock of slow moving drugs								
Prescription attached with consultation tickets								
All prescriptions are stamped by statistic office								
All drugs dispensed according to the valid price list								
Clean pharmacy								
Good storage of drugs								
No empty boxes								
Cashier records of drug sold are eligible								
Drug invoices are well filed								

Any other comments:
1-……
2-……
3-……
4-……

APPENDIX 4

RDF ABC-ANALYSIS (DRUGS` CONSUMPTION 1999)

SE.No.	PER.%	ITEM DESCRIPTION	QUANTITY	TOTAL VALUE US$	PER%	ACCUM.%
1	1	CHLOROQUINE 20MG/ML IN 5 ML AMP.	3,787,970	359,857	15.47	15.5
2	2	AMOXYCILLIN 250 MG CAPS.	4,463,000	151,742	6.52	22.0
3	4	AMOXYCILLIN 125 MG/5ML SUS.	187,482	124,863	5.37	27.4
4	5	PENICILLIN CRYSTALLINE 1MEG	1,075,495	108,625	4.67	32.0
5	6	DEXTROSE 5% IN N.SALINE,500ML+ SET	205,721	101,832	4.38	36.4
6	7	AMPICLOX 125 MG/5ML SUS.	97,717	86,968	3.74	40.2
7	8	QUININE SULPHATE 300MG TABS.	1,084,280	82,080	3.53	43.7
8	9	DISP. SYRINGE 5CC +NEEDLES	1,674,317	80,200	3.45	47.1
9	11	ERYTHROMYCINE 125MG/5ML SUS.	62,843	67,619	2.91	50.0
10	12	INSULIN SOL.40 IU INJ.	22,107	64,287	2.76	52.8
11	13	CHLOROQUINE 50MG/5ML SYRUP	130,405	59,465	2.56	55.4
12	14	PARACETAMOL 125 MG/5ML SYRUP	113,905	55,358	2.38	57.7
13	15	SODIUM CHLORIDE 0.9% IN 500ML+SET	109,884	54,393	2.34	60.1
14	16	INSULIN ZINC,40 IUINJ.	18,550	53,943	2.32	62.4
15	18	DISPOSABLE SYRINGE 2CC+ NEEDLES	1,394,550	52,575	2.26	64.7
16	19	COTRIMOXAZOLE SUS.	104,607	51,090	2.20	66.8
17	20	DEXTROSE 5% IN WATER,500ML+SET	99,057	49,063	2.11	69.0
18	21	PENICILLIN PROCAINE,1 MEG	215,063	44,088	1.90	70.9
19	22	ERYTHROMYCIN 250 MG TABS.	831,200	35,908	1.54	72.4
20	24	AMPICLOX 500MG CAPS	688,000	34,400	1.48	73.9
21	25	HYDROCORTISONE 100MG INJ.	54,889	29,530	1.27	75.1
22	26	QUININE 300MG/ML IN 2ML AMP.	122,765	28,850	1.24	76.4
23	27	INSULIN DIS. SYRINGE 1CC	293,826	28,501	1.23	77.6
24	28	PARACETAMOLE 500 MG TABS.	7,109,200	28,437	1.22	78.8
25	29	FERROUS FUMERATE 25MG/5ML SYRUP	39,646	25,532	1.10	79.9
26	31	WATER FOR INJECTION 5ML AMP.	830,533	24,916	1.07	81.0
27	32	COTRIMOXAZOLE TABS	1,871,000	24,323	1.05	82.0
28	33	TETRACYCLINE 250 MG CAPS.	2,249,100	22,491	0.97	83.0
29	34	IBUPROFEN 200MG TABS.	2,327,000	20,943	0.90	83.9
30	35	METRONIDAZOLE 125 MG/5ML SUS.	43,679	20,660	0.89	84.8
31	36	CHLOROQUINE 150MG TABS.	1,854,750	20,402	0.88	85.7
32	38	MULTIVITAMIN SYRUP	33,960	20,274	0.87	86.6
33	39	METHYLDOPA 250MG TABS.	677,000	18,956	0.81	87.4
34	40	LIGNOCAINE 2%+ADRENALINE 1.8ML	68,877	18,115	0.78	88.1
35	41	METRONIDAZOLE 200MG TABS.	2,518,000	17,626	0.76	88.9
36	42	PRAZIQUANTEL 600MG TABS.	119,514	14,939	0.64	89.5
37	44	TETRACYCLINE 1%EYE OINTMENT	74,992	13,649	0.59	90.1
38	45	METRONIDAZOLE INFUSION	10,832	13,323	0.57	90.7
39	46	STREPTOMYCINE 1G INJ.	133,894	12,720	0.55	91.3
40	47	AMOXYCILLIN 250 MG/5ML SUS.	24,959	12,679	0.55	91.8
41	48	CHLORAMPHENICOL 1G INJ.	32,114	12,043	0.52	92.3
42	49	DISPENSING PLASTIC BAGS	2,864,200	11,743	0.50	92.8
43	51	HYOSCINE BUT.BROM.10MG TABS.	653,000	9,795	0.42	93.2
44	52	SALBUTAMOL 2MG/5ML SYRUP	15,802	9,702	0.42	93.7
45	53	HYOSCINE BUT.BROM.20MG/2ML AMP.	63,774	9,604	0.41	94.1
46	54	AMPICILLIN 500MG INJ.	40,474	8,742	0.38	94.4
47	55	CHLORAMPHENICOLE 1%EYE DROPS	23,464	8,517	0.37	94.8
48	56	AMP.250MG +CLOX.250MG INJ.	35,170	6,879	0.30	95.1
49	58	FANSIDAR 25MG&500MG TABS.	155,800	6,808	0.29	95.4
50	59	ASPIRIN 300MG TABS	2,207,000	6,621	0.28	95.7
51	60	NYSTATINE 100000 UNITS/5ML SUS.	7,798	6,363	0.27	96.0
52	61	GENTAMYCINE 40MG/ML, IN 2ML AMP.INJ	48,025	6,339	0.27	96.2
53	62	PENICILLIN BEZATHINE 1.2 MU	16,992	6,100	0.26	96.5
54	64	PROMETHAZINE 25MG/ML INJ.	66,641	5,931	0.25	96.8
55	65	CHLORAMPHENICOL 5% EAR DROPS.	11,995	5,758	0.25	97.0

Cont.

SE.No.	PER.%	ITEM DESCRIPTION	QUANTITY	TOTAL VALUE US$	PER%	ACCUM.%
56	66	DIAZEPAM 5MG INJ.	58,890	5,595	0.24	97.2
57	67	LIGNOCAINE 2% IN 50ML	8,873	5,040	0.22	97.5
58	68	FRUSEMIDE 20MG/2ML AMP.	44,830	4,931	0.21	97.7
59	69	MULTIVITAMINE TABS.	1,417,000	4,251	0.18	97.9
60	71	CHLOROPHENIRAMIN 2MG/2ML AMP.	40,107	4,211	0.18	98.0
61	72	CHLOROPHENIRAMINE 4MG TABS.	1,347,000	4,041	0.17	98.2
62	73	MAGNESIUM TRISILICATE TABS.	791,700	3,959	0.17	98.4
63	74	MEBENDAZOLE 125MG/5ML SUS.	8,177	3,941	0.17	98.5
64	75	PROMETHAZINE 5MG/5ML SYRUP	5,260	3,414	0.15	98.7
65	76	AMINOPHYLLINE 250MG/10ML AMP.	25,622	3,367	0.14	98.8
66	78	FERROUS SUL+ FOLIC ACID TABS.	1,012,000	3,036	0.13	99.0
67	79	GLIBENCLAMIDE 5MG TABS.	626,000	2,692	0.12	99.1
68	80	NYSTATINE100000 UNITS PESS.	93,250	2,518	0.11	99.2
69	81	FERROUS SULPH.60MG TABS.	780,000	2,340	0.10	99.3
70	82	SALBUTAMOL 4MG TABS.	511,000	2,044	0.09	99.4
71	84	FRUSEMIDE 40 MG TABS.	267,000	1,869	0.08	99.5
72	85	PROMETHAZINE 25 MG TABS.	291,000	1,746	0.08	99.5
73	86	THYROXINE 50MICROGRAM TABS.	314,600	1,573	0.07	99.6
74	87	ADRENALINE INJ.	14,884	1,474	0.06	99.7
75	88	ISON. 300MG+THIACET. 150MG TABS.	111,000	1,221	0.05	99.7
76	89	INDOMETHACINE 25MG TABS.	393,000	1,179	0.05	99.8
77	91	DIGOXINE0.25 MG TABS.	162,000	988	0.04	99.8
78	92	PROPRANOLOL 40MG TABS.	115,100	921	0.04	99.9
79	93	FOLIC ACID 5MG TABS.	400,000	800	0.03	99.9
80	94	SENNA 7.5MG TABS.	93,450	748	0.03	99.9
81	95	DIAZEPAM 5MG TABS.	353,000	706	0.03	99.9
82	96	HYOSCINE BUT.BROM.10MG/5ML SYRUP	750	571	0.02	100.0
83	98	LOPERAMIDE 2MG TABS.	83,780	478	0.02	100.0
84	99	CARBIMAZOLE 5MG TABS.	6,700	127	0.01	100.0
85	100	MEBENDAZOLE 10MG TABS.	1,300	11	0.00	100.0
		TOTAL		2,325,959		

APPENDIX 5

RDF NEED ASSESSMENT SPREAD SHEET

No.	Item Description	Unit Cost US$	Average Consumption A	Current Stock B	Safety Stock 2 XA=C	Stock Issued During Lead time 3XA=D	Reorder Level E= C+ D	Order Quantity for 6 months F= 6XA	Quantity to be ordered G=F+E-B	Estimated Cost in US$ GXUnit Cost
1	ADRENALINE INJ.	0.0990	500	250	1000	1500	2500	3000	5250	520
2	AMINOPHYLLINE 250mg inj.	0.1314	100	50	200	300	500	600	1050	138
3	AMOXYCILLIN 125 mg SUS.	0.6660	250	200	500	750	1250	1500	2550	1698
4	AMOXYCILLIN 250 MG CAPS.	0.0340	4000	3000	8000	12000	20000	24000	41000	1394
5	AMOXYCILLIN 250 MG/5ML SUS.	0.5080	125	100	250	375	625	750	1275	648
6	AMP.250MG +CLOX.250MG INJ.	0.1956	200	50	400	600	1000	1200	2150	421
7	AMPICILLIN 500MG INJ.	0.2160	100	40	200	300	500	600	1060	229
8	AMPICLOX 125 MG/5ML SUS.	0.8900	200	50	400	600	1000	1200	2150	1914
9	AMPICLOX 500MG CAPS	0.0500	4000	2000	8000	12000	20000	24000	42000	2100
10	ASPIRIN 300MG TABS	0.0030	5000	3000	10000	15000	25000	30000	52000	156
11	CARBIMAZOLE 5MG TABS.	0.0190	500	1000	1000	1500	2500	3000	4500	86
12	CHLORAMPHENICOL 1G INJ.	0.3750	1000	500	2000	3000	5000	6000	10500	3938
13	CHLORAMPHENICOL 5% EAR DROPS.	0.4800	100	50	200	300	500	600	1050	504
14	CHLORAMPHENICOLE 1%EYE DROPS	0.3630	200	100	400	600	1000	1200	2100	762
15	CHLOROPHENIRAMIN 2MG/2ML AMP.	0.1050	50	20	100	150	250	300	530	56
16	CHLOROPHENIRAMINE 4MG TABS.	0.0030	1000	1000	2000	3000	5000	6000	10000	30
17	CHLOROQUINE 150MG TABS.	0.0110	6000	3000	12000	18000	30000	36000	63000	693
	TOTAL ESTIMATED ORDER Value									5047

APPENDIX 6

RDF PRICE INCREASE SPREAD SHEET

ITEM DESCRIPTION	UNIT COST (US$)	DRUG COURSE	CURRENT COURSE PRICE	COST PER CPURSE USING NEW	SALE PRICE TO ATTAIN 64% MARL-UP	SUGGESTED NEW PRICE PER COURSE	PRIVATE PHARMACY OURSE PRIC	PEOPLES PHARMACY COURSE PRIC	OTHER HOSPITAL PRIC (CMS+20%)	QUANTITY SOLD LAST YEAR	LAST YEAR SALES PRESENT PRICE	COST OF SALE USING NEW EX. RATE	VALUE OF SALE USING NEW PRICE	MARGIN	MARK U %	SALES VALUES PRIVATE PRICE	SALES VALUES CMS PRICES
				EX. RATE(2587)													
AMOXYCILLIN 125mg /5ml sus.	0.6660	1	2000	1723	2826	2500	3500	2000	1500	187482	374964000	323020612	468705000	145684388	45%	656187000	281223000
AMOXYCILLIN 250mg caps.	0.0340	12	2000	1055	1731	1700	3000	2200	1500	4463000	743833333	392556554	632258333.3	239701779.3	61%	1115750000	557875000
CHLOROQUINE 20mg/ml 5 ml amp.	0.0950	1	300	246	403	350	600	450	400	3787970	1136391000	930950447	1325789500	394839053	42%	2272782000	1515188000
CHLOROQUINE 50mg/5ml syrup.	0.4560	1	1000	1180	1935	2000	3500	1750	1500	130405	130405000	153835127	260810000	106974873	70%	456417500	195607500
COTRIMOXAZOLE sus.	0.4884	1	1500	1263	2072	2000	3000	2250	2000	104607	156910500	132169982	209214000	77044018	58%	313821000	209214000
DEXTRISE 5% In n.Saline 500ml+set.	0.4950	1	2500	1281	2100	2000	3500	2750	2500	205721	514302500	263439112	411442000	148002888	56%	720023500	514302500
DEXTRISE 5% In Water 500ml+set.	0.4953	1	2500	1281	2101	2000	3500	2750	2500	99057	247642500	126925805	198114000	71188195	56%	346699500	247642500
DISP. Syringe 5cc + Needles.	0.0479	1	200	124	203	200	300	250	200	1674317	334863400	207476842	334863400	127386558	61%	502295100	334863400
DISPOSABLE SYRINGE 2CC+Needles.	0.0377	1	200	98	160	150	300	250	250	1394550	278910000	136010322	209182500	73172178	54%	418365000	348637500
PENICILLIN PROCAINE 1 meg.	0.2050	1	800	530	870	800	850	750	500	215063	172050400	114055436	172050400	57994964	51%	182803550	107531500
ERYTHROMYCINE 250mg tabs.	0.4320	20	3500	2235	3666	3500	5500	4500	3500	831200	145460000	92893582	145460000	52566418	57%	228580000	145460000
AMPICLOX 500mg caps.	0.0500	16	3500	2070	3394	300	6000	5500	2750	688000	150500000	88992800	12900000	-76092800	-86%	258000000	118250000
HYDROCORTISONE 100mg inj.	0.5380	1	1500	1392	2283	2250	8000	4000	1500	54889	82333500	76394840	123500250	47105410	62%	439112000	82333500
QUININE 300mg/ml 2ml amp.	0.2350	1	500	608	997	1000	800	700	650	122765	61382500	74634368	122765000	48130632	64%	98212000	79797250
INSULIN DIS. SYRINGE 1CC.	0.9700	1	200	251	412	400	250	250	200	293826	58765200	73732403	117530400	43797997	59%	73456500	58765200
PARACETAMOL 500mg tabs.	0.0040	10	250	103	170	200	250	250	200	7109200	177730000	73566002	142184000	68617998	93%	177730000	142184000
WATER for INJECTION 5ml amp.	0.0300	1	100	78	127	100	200	150	100	830533	83053300	64457666	83053300	18595634	29%	166106600	83053300
COTRIMOXAZOLE tabs.	0.0130	20	500	673	1103	1000	1000	800	500	1871000	46775000	62923601	93550000	30626399	49%	93550000	46775000
TETRACYCLINE 250mg caps.	0.1000	16	600	414	679	600	1500	1400	600	2249100	84341250	58184217	84341250	26157033	45%	210853125	84341250
IBUPROFEN 200mg tabs.	0.0090	20	750	466	764	750	1000	1000	800	2327000	87262500	54179541	87262500	33082959	61%	116350000	93080000
ERYTHROMYCINE 125mg/5ml sus.	1.0760	1	2750	2784	4565	4500	5500	2800	300	62843	172818250	174930529	282793500	107862971	62%	345636500	18852900
INSULIN SOL. 40 IU inj.	2.9080	1	7750	7523	12338	7000	18000	17000	16500	22107	172329250	166310873	154749000	-11561873	-7%	397926000	364765500
INSULIN ZINC 40 IU inj.	2.9080	1	7750	7523	12338	7000	18000	17000	16500	18550	143762500	139551576	129850000	-9701576	-7%	333900000	306075000
PARACETAMOL 125mg/5ml syrup.	0.4860	1	1000	1257	2062	1500	2500	1750	1500	113905	113905000	143210706	170857500	27646794	19%	284762500	170857500
PENICILLIN CRYSTALLINE 1 meg.	0.1010	1	500	261	429	400	750	500	500	1075495	537747500	281012862	430198000	149185138	53%	806621250	537747500
QUININE SULPHATE 300mg tabs.	0.0757	30	5000	5875	9635	9500	10500	6800	6750	1084280	180713333	212340950	343355333.3	131014383.3	62%	379498000	243963000
SODIUM CHLORIDE 0.9% in 500ml + se	0.4950	1	2500	1281	2100	2500	3500	2750	2500	109884	274710000	140713604	274710000	133996396	95%	384594000	274710000
Total											6,662,861,717	4,758,470,359	7,021,489,167	2,263,018,808	48%	11,780,032,625	7,163,095,800
											(A)	(B)	(C)	(D)	D/BX100	(E)	(F)
RESULT OF PRICE CHANGE															5%	48%	60%	98%
TARGETS															%increase=(C-A)/	64%	C/E=40-50%	C/F=100%+5%

Appendix 7

RDF Stock Book

ITEM	FIRST MONTH			SECOND MONTH			THIRD MONTH		
	PHYSICAL BALANCE	QUANTITY REQUESTED	QUANTITY SUPPLIED	PHYSICAL BALANCE	QUANTITY REQUESTED	QUANTITY SUPPLIED	PHYSICAL BALANCE	QUANTITY REQUESTED	QUANTITY SUPPLIED
ADRENALINE INJ.									
AMINOPHYLLINE 250MG/10ML AMP.									
AMOXYCILLIN 125 MG/5ML SUS.									
AMOXYCILLIN 250 MG CAPS.									
AMOXYCILLIN 250 MG/5ML SUS.									
AMP.250MG +CLOX.250MG INJ.									
AMPICILLIN 500MG INJ.									
AMPICLOX 125 MG/5ML SUS.									
AMPICLOX 500MG CAPS									
ASPIRIN 300MG TABS									
CARBIMAZOLE 5MG TABS.									
CHLORAMPHENICOL 1G INJ.									
CHLORAMPHENICOL 5% EAR DROPS.									
CHLORAMPHENICOLE 1%EYE DROPS									
CHLOROPHENIRAMIN 2MG/2ML AMP.									
CHLOROPHENIRAMINE 4MG TABS.									
CHLOROQUINE 150MG TABS.									
CHLOROQUINE 20MG/ML IN 5 ML AMP.									
CHLOROQUINE 50MG/5ML SYRUP									
COTRIMOXAZOLE SUS.									
COTRIMOXAZOLE TABS									

Pharmacist Signature…….. Pharmacist Signature…….. Pharmacist Signature……..……..

Medical Director Sig…….. Medical Director Sig……..… Medical Director Sig……...……..

Drug Supply Dept. Sig…….. Drug Supply Dept. Sig…… Drug Supply Dept.Sig……...

Appendix 8

HEALTH FACILITIES STOCK COUNTING FORM

ITEM	LAST WEEK STOCK (A)	DRUG RECEIVED DURING THE WEEK (B)	DRUG WITHDRAWN DURING THE WEEK (C)	STOCK BALANCE E = A +B-C	CURRENT STOCK (F)	QUANTITIES SOLD DURING THIS PERIOD G = E-F	UNIT SALE PRICE H	VALUE OF DRUG SOLD DURING THE WEEK I = G X H
ADRENALINE INJ.								
AMINOPHYLLINE 250MG/10ML AMP.								
AMOXYCILLIN 125 MG/5ML SUS.								
AMOXYCILLIN 250 MG CAPS.								
AMOXYCILLIN 250 MG/5ML SUS.								
AMP.250MG +CLOX.250MG INJ.								
AMPICILLIN 500MG INJ.								
AMPICLOX 125 MG/5ML SUS.								
AMPICLOX 500MG CAPS								
ASPIRIN 300MG TABS								
CARBIMAZOLE 5MG TABS.								
CHLORAMPHENICOL 1G INJ.								
CHLORAMPHENICOL 5% EAR DROPS.								
CHLORAMPHENICOLE 1%EYE DROPS								
CHLOROPHENIRAMIN 2MG/2ML AMP.								
CHLOROPHENIRAMINE 4MG TABS.								
CHLOROQUINE 150MG TABS.								
CHLOROQUINE 20MG/ML IN 5 ML AMP.								
CHLOROQUINE 50MG/5ML SYRUP								
COTRIMOXAZOLE SUS.								
COTRIMOXAZOLE TABS								
TOTAL VALUE OF THE DRUGS SOLD DURING THE LAST WEEK (IT SHOULD EQUALTO THE CASH IN THE SAFE)								

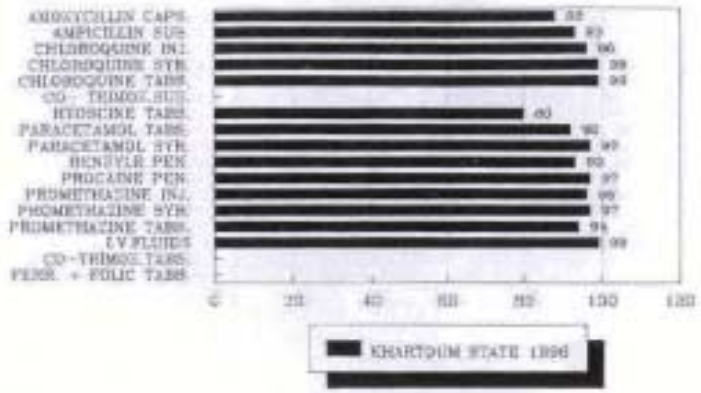
APPENDEIX 9

PRICES OF CLASS A-ITEMS FROM ABC ANALYSIS

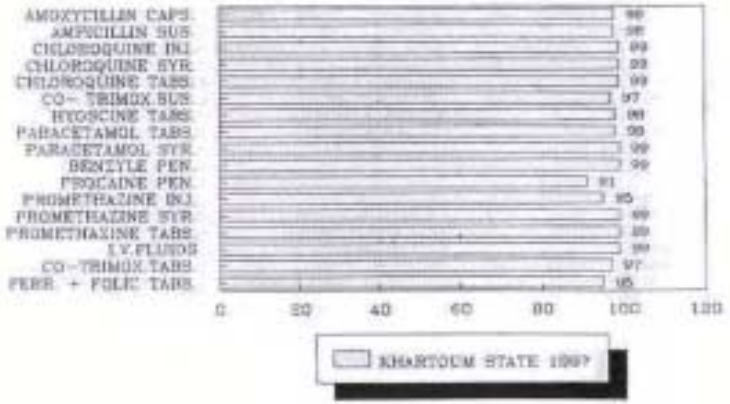
PRODUCT	Unit	RDF-PURCHASE cost (CIF)	MSH PRICE INDI. 1999 + 15%	CMSPO WHOLE PRICE	COMMERCIAL WHOLE PRICE	COMMERCIAL RETAIL PRICE	LOCAL MANUF WHOLE PRICE	RDF COST/MSH PRICE	RDF COST/COMM. RETAIL PRICE	RDF COST/CMSPO WHOLE PRICE	RDF COST/ COMMERCIAL WHOLE PRICE	RDF COST/LO. MANUFACTURERS WHOLE PRICE
CHLOROQUINE 20mg/ml in 5ml amp.	5 ml	0.078	0.082	0.119	0.164	0.194	0.081	95%	40%	65%	48%	97%
AMOXYCILLIN 250mg caps.	Cap	0.026	0.025	0.04	0.055	0.065	0.04	104%	40%	65%	47%	65%
AMOXYCILLIN 125mg/5ml sus.	100 ml	0.564	0.637	0.446	0.983	1.16	1.02	89%	49%	126%	57%	55%
PENICILLIN CRYSTALLINE 1meg.	Vail	0.074	0.152	0.149	0.164	0.193		49%	38%	50%	45%	
DEXTROSE 5% in N.SALINE 500ml+set.	500 ml	0.633	0.695	0.743	0.983	1.16	0.693	91%	55%	85%	64%	91%
AMPICLOX 125mg/5ml sus.	100 ml	0.89		0.818	1.368	1.614	1.289		55%	109%	65%	69%
QUININE SULPHATE 300mg tabs.	Tab	0.036	0.037	0.669	0.115	0.136	0.054	95%	26%	5%	31%	67%
DISP. SYRING 5CC+NEEDLES.	Piece	0.039		0.074	0.082	0.097			40%	53%	48%	
ERYTHROMYCINE 125mg/5ml sus.	100 ml	0.805	1.273	0.892	1.802	2.126	1.45	63%	38%	90%	45%	56%
INSULIN Sol 40 IU inj.	Vail	2.484	2.359	1.998	2.359	2.784		105%	89%	124%	105%	
CHLOROQUINE 50mg/5ml syrup.	60 ml	0.311	0.396	0.446	1.147	1.353	0.618	79%	23%	70%	27%	50%
PARACETAMOL 125mg/5ml syrup.	60 ml	0.345	0.306	0.446	0.655	0.773	0.499	113%	45%	77%	53%	69%
SODIUM CHLORIDE 0.9% in 500ml+set.	500 ml	0.633	0.695	0.743	0.983	1.16	0.693	91%	55%	85%	64%	91%
INSULIN ZINC, 40 IU inj.	Vail	2.484	2.359	1.998	2.359	2.784		105%	89%	124%	105%	
SISPOSABLE SYRING 2CC+NEEDLE.	Piece	0.032		0.074	0.082	0.097			33%	43%	39%	
COTRIMOXAZOLE sus.	100 ml	0.38	1.875	0.595	0.819	0.966	0.676	20%	39%	64%	46%	56%
DEXTROSE 5% in water 500ml+set.	500 ml	0.633	0.695	0.743	0.983	1.16	0.693	91%	55%	85%	64%	91%
PENICILLIN PROCAINE 1 meg.	Vail	0.077	0.107	0.149	0.246	0.29		72%	27%	52%	31%	
ERYTHROMYCIN 250mg tabs .	Tab	0.04	0.046	0.052	0.09	0.106	0.081	88%	38%	78%	45%	50%
AMPICLOX 500mg caps.	Cap	0.045		0.051	0.123	0.145	0.09		31%	88%	37%	50%
HYDROCORTISONE 100mg inj.	Vail	0.345	0.44	0.446	2.621	3.093		78%	11%	77%	13%	
QUNINE 300mg/ml in 2ml amp.	2 ml	0.161	0.175	0.193	0.262	0.309		92%	52%	83%	61%	
AVERAGE								84%	44%	77%	52%	63%

1. PRICE ARE GIVEN IN US$, CONVERTED FROM SUDANESE POUNDS AT A RATE OF 2587 POUND TO US$
2. CMSPO PRICES JUNE 2000
3. COMMERCIAL RETAIL AND WHOLE COLLECTED FROM THE RETAIL PHARMACIES IN KHARTOUM JUNE 2000
4. RDF CIF PRICES JUNE 2000
5. MSH INTERNATIONAL DRUG PRICE INDICATOR GUIDE 1999 AVERAGE PRICE + 15% TOAPPROXIMATE CIF PRICE
6. LOCAL MANUFACTURERS (L.MANU.) JUNE 2000

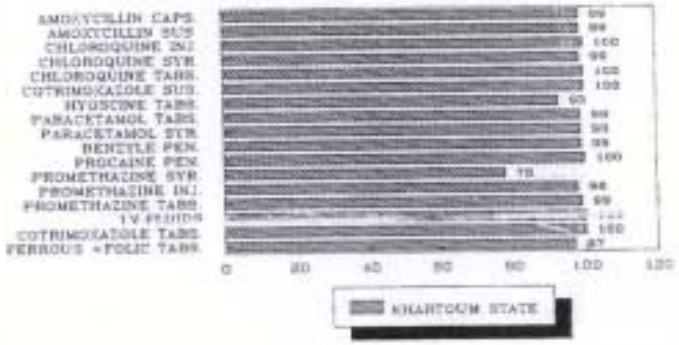
DRUG AVAILABLITY
KHARTOUM STATE 1996



DRUG AVAILABLITY
KHARTOUM STATE 1997



DRUG AVAILABLITY
YEAR ENDED 1998



DRUG AVAILABLITY
YEAR ENDED 1999