Report No. 16567-CD

Chad
Poverty Assessment:
Constraints to Rural Development

October 21, 1997

Human Development, Group IV
Africa Region

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ABBREVIATIONS AND ACRONYMS

AMTT	Agricultural Marketing and Technology Transfer Project
AV	Association Villageoise
BCA	Bœufs de culture attelée
BEAC	Banque des Etats de l'Afrique Centrale
BET	Borkou-Ennedi-Tibesti
BIEP	Bureau Interministériel d'Etudes et des Projets
BNF	Bureau National de Frêt
CAER	Compte Autonome d'Entretien Routier
CAR	Central African Republic
CFA	Communauté Financière Africaine
CILSS	Comité Inter-états de Lutte Contre la Sécheresse au Sahel
DCPA	Direction de la Commercialisation des Produits Agricoles
DD	Droit de Douane
DPPASA	Direction de la Promotion des Produits Agricoles et de la Sécur
DSA	Direction de la Statistique Agricole
EU	European Union
FAO	Food and Agriculture Organization
FEWS	Famine Early Warning System
FIR	Fonds d'Investissement Rural
GDP	Gross Domestic Product
GNP	Gross National Product
INSAH	Institut du Sahel
IRCT	Institut de Recherche sur le Coton et le Textile
LVO	Lettre de Voiture Obligatoire
MTPT	Ministère des Travaux Publics et des Transports
NGO	Nongovernmental Organization
ONDR	Office National de Developpement Rural
PASET	Projet d'Ajustement Sectoriel des Transports
PRISAS	Programme Régional de Renforcement Institutionnel en matie sur la Sécurité Alimentaire au Sahel
PST	Projet Sectoriel Transport
RCA	Republique Centrafrcaine
SAP	Système d'Alerte Précoce
SCCL	Societé Commerciale du Logone et du Chari
SIM	Système d'Information sur les Marchés
SNER	Societé Nationale d'Entretien Routier
SOGEC	Societé Générale d'Etudes et de Conseils
SONASUT	Societé Nationale Sucrière du Tchad
TC	Taxe Complémentaire
TEC	Tarif Extérieur Commun
TCA	Taxe sur le Chiffre d'Affaire
TN	Taux Normal
TPG	Tarif Préférentiel Généralisé
TR	Taux Réduit
TSP	Transport Sector Project
TSP2	Transport Sector Investment Project II
UDEAC	Union Douanière des Etats de l'Afrique Centrale
UNDP	United Nations Development Program
USAID	United States Agency for International Development
VITA	Volunteers in Technical Assistance

CURRENCY EQUIVALENT (1996 Averag
Currency Unit = CFA Franc (CFAF)/US$1 = 525.3

Weights and Measures

1 hectare	=	2.74109 acres
1 kilogram	=	2.204622 pounds
1 metric ton liquid milk	=	971 liters
1 metric ton	=	2204.622 pounds

We dedicate this work to the memory of David Jones

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PREFACE

This Assessment synthesizes contributions from the Government and the World Bank team committed to Chad, including Menahem Prywes (Task Team Leader and Human Resources Economist), David Bigman (Macro-economist), Ellen Cohen, (Public Sector Management Officer), Dieneba Diarra-Kambou (Economist), Alain D'Hoore (Macro-economist), Michele Lioy (Health Specialist), Mitesh Thakkar (Education Specialist), Saji Thomas (Statistician), Pierre Nadji (Macro-Economist), Carolyn Winter (Education Specialist), Ronald Kenyon, Anne-Sophie Ville and Nellie Sew Kwan Kan (Task Team Assistants). Ismael Ouedraogo, Mark Newman and Carol Adoum (Agricultural Economists from Abt Associates) conducted a rapid rural appraisal and made important contributions to the analysis of agriculture (Chapter 2). The team thanks Martin Ravallion and Jack van Holst Pellekaan (Peer Reviewers), as well as Andrew Rogerson (Former Director), David Berk (Former Acting Country Director), Nicholas Bennett and Penelope Bender (Education Specialists), and Eugen Scanteie (Principal Economist), for comments and guidance.

We thank the Department of Statistics, in the Ministry of Planning, for producing much of the quantitative basis of the Assessment. We also thank the UNDP for their support for the recent household survey produced by the Department of Statistics.

Finally we recognize the guidance and inspiration received from David Jones, our former Representative in Chad.

EXECUTIVE SUMMARY AND ACTION PLAN

1. This Assessment focuses on rural development because more than four-fifths of the population and an even larger proportion of the poor live in rural areas. The more specific focus is on agriculture since more than four-fifths of the economically-active population works in agriculture and because agriculture is the most likely source of improvements in incomes that would benefit the poor majority. Finally, it focuses on women, who contribute much of agricultural labor, because they are an important source of improvements in agricultural incomes.

2. The Assessment finds a pattern of severe poverty in the available indicators, whether of living conditions (potable water, toilets, housing), food security (nutrition, famine), survival, morbidity, education, or of household assets (such as plows), incomes, and expenditures. The pattern is often one of poverty that is spread across the major regions, although several aspects such as famine, primary school enrollment and the proportion of women-headed households differ across regions. Moreover, women in every region are particularly poor in terms of education, health and land.

3. The Assessment concludes that Chad has excellent prospects for emerging from severe poverty and of sustaining improvements in public well-being through the efforts of poor agricultural producers of livestock and crops. A main avenue of action to raise producer prices would be investment in rehabilitation of roads to reduce transport costs of agricultural products. This would be reinforced by a further avenue of actions to reduce costs to agricultural producers, particularly taxes imposed by local and traditional leaders and those imposed illegally on transport. A parallel measure would be to reduce the implicit charge on cotton producers, who receive a fraction of the world price of seed-cotton, through cautious liberalization of the market. Higher incomes would then allow agricultural producers to make some of the investments (in livestock, and agricultural equipment) necessary to increase their productivity, so that further increases in production become possible. Higher and sustained investment in basic education and health and especially for girls, would further improve the well-being and agricultural productivity of producers over the long-term.

4. These positive prospects are founded on the Government's determination to focus public expenditure on poverty reducing investments (on roads, health, education), to adopt the needed policies, and on the expected development of petroleum resources.

A. Extent and Distribution of Poverty

5. The background to poverty is the physical size of the country that may lead to isolation, the sometimes harsh natural environment and the diversity of the environment. The southern or Soudanian zone is ecologically part of the wet Congo basin; the main cash crop is cotton, but farmers raise large crops of peanuts, millet and sorghum. The dry Sahel zone lies at the middle

of Chad; the main activities are cattle herding and farming of cereals such as millet and *bérbéré* (a form of Sorghum). The Saharan zone lies to the north and the main economic activities are dates, camel herding and transport. In 1993, nearly half the population lived in the Soudan and half lived in the Sahel, while only 4 percent lived in the Sahara.

6. Poverty is defined in economic terms as household expenditures or revenues that fall below a preset poverty line. The best available source of information on the extent and characteristics of poverty when this Assessment was prepared were the indicators of living conditions, health, education and family structure from the 1993 Census. Information from the Census was reinforced by annual government data on education and health as well as data on rural conditions from the Ministries of Rural Development, Agriculture and Livestock and the *Office National de Développement Rural.* Fortunately, research has shown that these indicators are closely correlated with expenditure-based measures of poverty.

7. However, the paucity of information did limit the measurement of poverty in Chad. There has not been a national survey of household expenditures and there does not seem to have been a national survey of nutrition. The Assessment does, however, make use of a 1991 household survey for N'Djaména. More importantly, the Assessment includes a brief summary of results from the Department of Statistics and UNDP survey of household expenditures in four large prefectures in 1995/96 that became available during the final editing. The Assessment also draws heavily on the considerable volume of studies of by academicians, donors and development consultancies, and on field visits.

8. Available data show that Chad is very poor relative to the needs of its residents and relative to its neighbors in sub-Saharan Africa. GNP per-capita, for instance, was US$180 in 1995 compared to US$490 for sub-Saharan Africa. The mortality of children under one year in 1995 was 117 per thousand live births compared to 92 for sub-Saharan Africa, 29 percent of the population had access to safe water compared to 47 percent for sub-Saharan Africa and the illiteracy rate in 1993 was 90 percent, compared to 50 percent for sub-Saharan Africa.

9. Poverty is severe in every region if one judges from the indicators of housing quality and access to potable water and type of toilet, but there are differences. Parts of the Sahel suffer from repeated famines and school enrollment is relatively low. Moreover, the Census reports a striking shortage of men in the most economically active age groups in parts of the Sahel. In the Soudan zone, school enrollment is relatively high, but several of the health indicators, in particular survival, are relatively weak. Farmers in the Soudan are also very poor in terms of agricultural implements such as plows and carts. The poverty rate in four large prefectures was about two-thirds in 1995-96, according to a preliminary calculation using the recent Department of Statistics-UNDP survey. This rate was defined as the percentage of households with food expenditures that fell below the amount needed to purchase the biologically necessary calories.

B. Agricultural Productivity

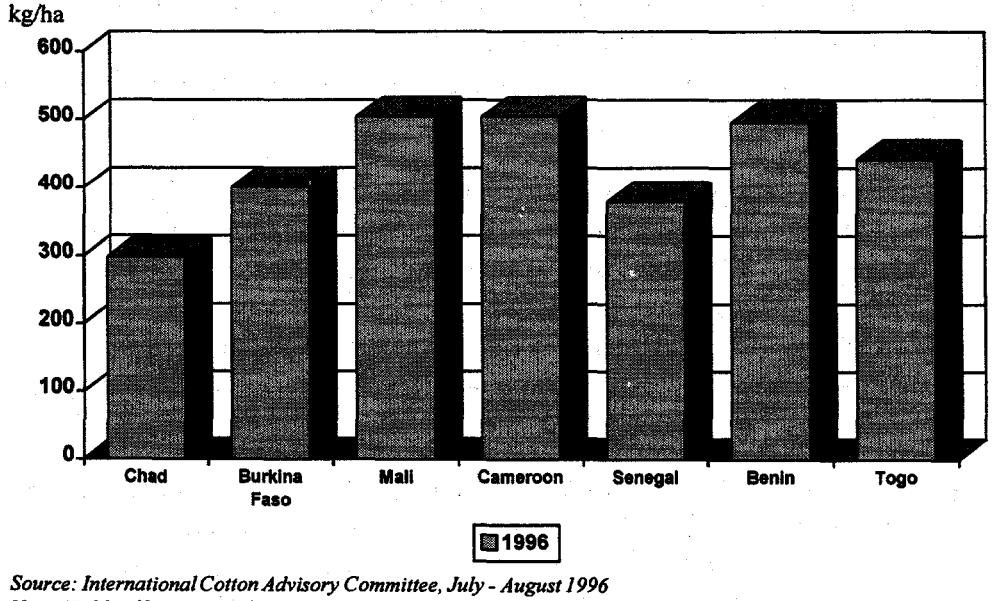
10. Any strategy to reduce this poverty must relax constraints to agriculture because crop and livestock production are the primary engines of growth in Chad. They contribute about one-half

of national income, when food and agriculture-related industry and services are included. For the most part, agricultural cash incomes in Chad are derived from sales of cotton, gum Arabic, peanuts, vegetables and cereals. Cotton crops and cotton lint have only a 10 percent share in the broad definition of agricultural GDP, yet the importance of cotton cannot be denied: cotton contributed 50 percent to the value of exports and 25 percent to government revenues. The cotton sub-sector helps sustain some 345,000 farm households and more than 2,000 salaried workers at Cottonchad. More important, perhaps, cotton is the major contributor to farm cash income because it remains the main commercial crop in Chad.

11. A poverty reduction strategy must nevertheless consider other crops and livestock as well. Cotton is produced only in the cotton zone of the Soudan and even in the zone, only about one-third of the planted area is in cotton. Surveys in the zone indicate that on average, cotton accounted for about two-fifths of gross farm revenue in 1995, while sorghum, groundnuts and peanuts contributed almost half of the total. Livestock is a dynamic source of growth of exports and also a store of wealth.

Figure 1

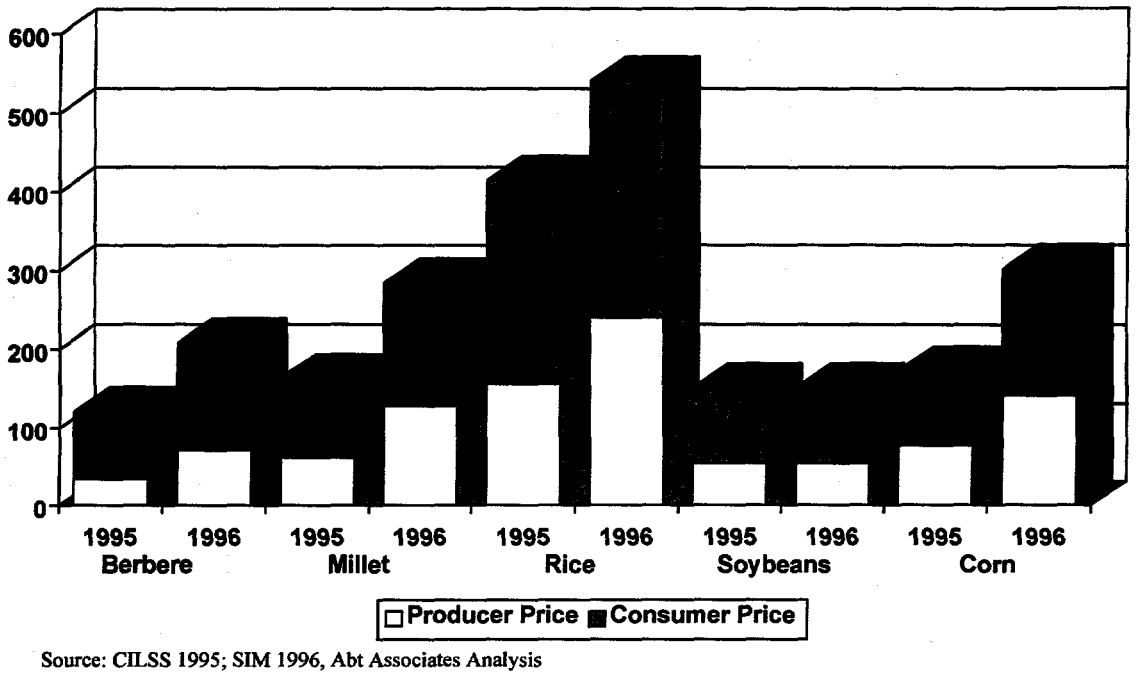
Cotton Fiber (Lint) Yields in Chad are Low



Source: International Cotton Advisory Committee, July - August 1996
Note: Yields of lint, not seed cotton.

12. With regard to crops, one of the most fundamental facts is that yields are low, even when compared to similar parts of Sub-Saharan Africa (Figure 1). The other fundamental fact is that producers receive a relatively small share of the revenue from their products, as measured by the share of producer prices in final consumer prices (Figure 2). This limits the incentive and the financial capacity to make improvements that would improve yields.

Figure 2
Producer Shares of Prices



Source: CILSS 1995; SIM 1996, Abt Associates Analysis

C. Transport Costs

13. Physical isolation is one of the causes of the wide gap between producer prices and final consumer prices. Some areas within Chad become enclaves during the rainy season. There are pockets of surplus production, where foodstuffs sit in storage because they cannot be sent to consumption centers and there are pockets of food shortage, where additional food cannot be delivered for months. For example, a major producer of grains and known as the potential "breadbasket" of Chad, the Salamat, has long been largely unreachable during 6 to 8 months of the year because of poor roads and high rainfall.

14. The main reason for the persistence of these enclaves is the low density of Chad's road network compared to many other Sub-Saharan countries. The 1972-82 civil conflict left Chad with only 30 km of paved roads in 1986. Since then, successive road rehabilitation projects have improved the road network, but much remains to be done: today, Chad still has very few paved roads, moreover, many unpaved roads are in poor condition.

15. Several studies in Chad link poor road infrastructure to high transport costs and the high transport costs to high consumer prices and low producer prices. The conclusion is that without improved roads, transport costs will probably not be brought low enough to improve the commercialization of agricultural products from enclaved regions and to reduce food insecurity.

D. Charges on Agricultural Producers

16. Another major constraint is the cumulative charge to agricultural producers. Charges are imposed by the central and local governments, traditional leaders, civil servants, and armed groups. Together, these charges drive a wedge between the price retained by farmers and herders and the price paid by the final buyer. The result is to reduce final consumption of Chadian agricultural products, to discourage production and investment in agriculture, and to harm farmers by lowering their incomes and consumption.

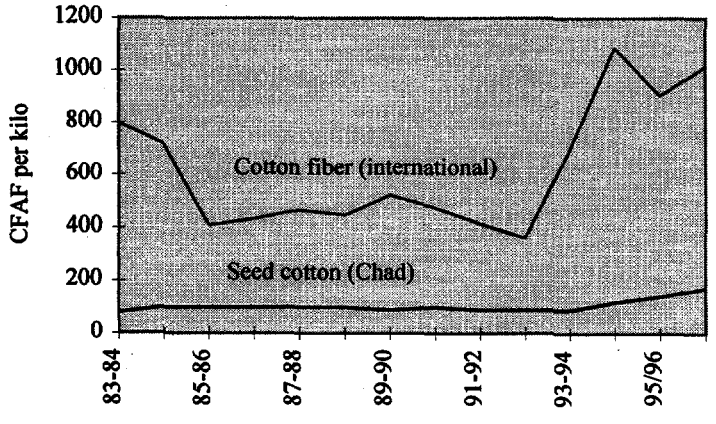
17. The main official taxes on agriculture are the UDEAC tariffs on imports of agricultural inputs such as fertilizers and tools, although these have been adjusted downwards over the past several years. There is also a statistical fee, a complimentary tax on agricultural equipment and diesel vehicles and rural investment fund and research taxes.

18. The operations of Cottonchad lead to an implicit charge on the small cotton farmers. Cottonchad is a majority state-owned company that also has a private share-holder, the CFDT, that manages much of the company under contract. Cottonchad has the exclusive legal right to buy unprocessed Chadian seed-cotton from producers, mostly poor small-farmers. It is also a vertically integrated monopsony that gins and then markets the processed cotton lint through its own network. Cottonchad buys at a price fixed in advance of the growing season, offering in effect a price guarantee and also provides fertilizer and pesticides on credit.

19. The issue of direct concern for the Assessment is the extent to which Cottonchad transfers resources from the small producers to its owners and managers by paying a price for seed-cotton that is below the competitive market price. A comparison of fluctuations in the price of seed cotton and cotton lint suggests that Cottonchad has not passed on most of the benefit of the devaluation of the CFAF to producers (Figure 3).

20. Despite the central government's efforts, local governments still continue to levy taxes on producers and traders of agricultural products, though the magnitude is reportedly less than in the past. For example, prefecture-level officials generally impose a tax on movement of cereals and sometimes other produce from one prefecture or even one market to another --in spite of repeated instructions in 1993 and again in 1994 and public announcements via radio and press that this illegal procedure would not be tolerated. Furthermore, local traditional and civil authorities also collect informally imposed 'taxes'.

Figure 3
Cotton Prices: 1983-97



21. Several studies have focused on the role of illegal road charges, or bribes, on raising transport costs within Chad. In recent years, the Chadian government and donors have joined forces in an effort to stamp out illegal payments and harassment of passengers

and transporters at internal road barriers. The President issued a decree in June 1993, banning road barriers and illegal searches of passengers and transporters throughout the territory and there were subsequent efforts to suppress roadblocks. However, illegal charges have two root causes that show no sign of disappearing: one is that low-paid paramilitary forces find in illegal payment a convenient means to supplement income. The second is that the victims, transporters, often themselves initiate bribes to avoid paying heavier fines for such violations as lack of proper transport documents, unsafe vehicles, desire for quick release at rain barriers and smuggling.

E. Women's Contribution to Agriculture

22. Women contribute much of agricultural labor and make some production decisions so that constraints on women reduce household incomes from agriculture. In many local traditions, for example, there are women's crops as well as women's tasks. Moreover, the traditional allocation of activities by gender results in a constraint on time. Rural women are traditionally responsible for household chores and maintenance, the preparation of food, transport of fuel wood and water, for much farming, the education of children and family health care. Women work longer hours than men and have less control of their time. This may crowd out time spent in agriculture and lower their productivity.

23. Limits on women's right to inherit land and to consume the product of the land may further constrain women's productivity. There is a basic tension in the legal system because national law recognizes women's rights but traditional law sometimes denies those same rights. Lack of rights may then discourage women's investment in land improvement, agricultural equipment and livestock. It may also lead to inefficient decisions about which land to work and what agricultural methods to use.

24. Another constraint is limited access to formal credit, which limits working capital and investment. Rural women have access to informal sources of credit and to credit in kind; to accumulate cash savings, women sometimes organize into informal, rotating, savings associations.

25. Women's general capacity for productive labor may be constrained by a combination of recurrent intestinal disease and malaria, poor nutrition, tightly spaced childbirths and female genital mutilation. Unfortunately, however, little is known about how women's general health is linked to their productivity in agriculture. The female disadvantage in education, as measured by school enrollment and literacy rates, more clearly constrains women's productivity. Several econometric studies document the link between female education and productivity in agriculture.

F. Education as a Constraint to Rural Incomes

26. Education may significantly constrain agricultural productivity by limiting the ability of both women and men to prevent disease, make use of extension and, most importantly, to respond to new technologies, markets and regulatory systems. Evidence from Asian studies suggests that a literate farmer has significantly greater productivity than an illiterate one. Moreover, a survey of econometric evidence suggests that educating rural women increases

agricultural productivity by making them more receptive to new technology and increases the chances that other women will adopt the technology.

27. Only half of Chadian children, and a third of girls, enter school. A dropout rate of 20 percent and a repetition rate of 35 percent suggest high levels of inefficiency in the system. Lack of public funds constrains the supply of basic education, but there is also a limited demand for education outside the towns, particularly in the Sahelian and Sahara regions, and also for girls. Lack of demand is often a response to the poor quality of education. The primary curriculum, calendar and structure may be poorly-adapted to Chadian needs: the school calendar, for example, is based on that of France and a Monday to Saturday school week, rather than on local agricultural cycles. Curriculum includes theoretical content that cannot be covered in the time allotted and there is insufficient focus on basic literacy and numeracy skills and health. A major quality problem is that schools are often closed or teachers are not present since they are sometimes not paid. Teachers who are not well paid or paid irregularly feel obliged to look for activities to supplement their earnings or even to abandon their posts for more lucrative employment. Textbooks in rural schools and instructional materials are almost non-existent and there are inadequate desks for students.

28. The inefficiencies of the system mean that the opportunity costs of primary education are high with 9 to 10 years needed to complete the primary cycle. This appears to constrain demand for the education of both girls and boys. The opportunity cost of enrolling a girl, for instance, in primary school may be high since school attendance reduces the time available for girls to do household chores. If they stay home they can fetch firewood and water, prepare meals and baby-sit, which frees their mothers for food or revenue-generating work.

G. HEALTH

29. The health situation in Chad remains precarious despite the efforts of the Ministry of Health during the past few years. In 1993, according to the Census, life expectancy at birth was only 50 years and mortality rates, especially of pregnant women and infants, were high. The principal causes of mortality and morbidity are infectious and parasitic diseases. Tuberculosis, leprosy and poliomyelitis are still prevalent and the prevalence of HIV is increasing. An additional concern is female genital mutilation, which is widespread and which poses a risk to women's health, as its physical and psychological effects on girls and women can be traumatic and can affect their reproductive health.

30. Almost 60 percent of the local health zones now have a functional health center but only about half the population of these zones really have access to basic health services because of distance, lack of roads, etc., and only about 35 percent of the population has access to modern health services. The quality of the services provided is often mediocre or poor because of insufficient equipment, lack of water, an irregular supply of medicines, and above all, a shortage of qualified personnel. The Government has committed itself to a National Health Policy that emphasizes access to primary health care and a reduced concentration of health sector management. Its budget expenditures on health have been increasing, and reached 7.5 percent of the budget in 1996 compared to 3.9 percent in 1988. Since 1989, external aid has represented

more than three-quarters of all health expenses of the public sector. Even with external aid, total Government spending on health only reached a relatively low US$4.50 per inhabitant in 1996.

H. Rule of Law

31. The rule of law as a constraint to rural development is a theme that appears in discussions of education, rights to land, taxation of agricultural producers by local officials and traditional leaders and bribes charged to transporters. The weakness of the banking and payments system may be related to the rule of law, since it is difficult to safely transport cash and appears related to enclavement resulting from the lack of roads and telecommunication. The difficulty of making payments increases the costs of trade in agricultural goods and inputs and the weak banking system means that there is nearly no formal private credit for agriculture.

I. An Action Plan to Reduce Poverty

32. The Assessment proposes a number of feasible avenues to poverty reduction, starting with actions to increase agricultural productivity and competitiveness by reducing the costs of transport and of modern inputs. The most important measure to reduce costs could be to upgrade the road network through rehabilitation. A program of road rehabilitation and maintenance that would improve road conditions, that would open the principal enclaves and connect food surplus regions to markets, would be a win-win proposition because it would reduce agricultural prices at final markets and increase prices to producers, while improving food security.

33. Specific road construction and rehabilitation projects normally need to be justified by an economic cost-benefit analysis in which the internal rate of return reaches a minimum threshold. Traditional methods of economic cost-benefit analysis often fail to demonstrate acceptable rates of return because the road network carries very little traffic on average, so that the direct economic benefits from reduced vehicle operating costs are low. On the cost side, the absence of suitable building materials (such as laterite and gravel) in many areas of Chad and the need to haul such materials over long distances, makes construction rather expensive.

34. Nevertheless roads provide numerous benefits which are not easily captured by traditional cost-benefit methods. It is difficult to measure the extent to which new or rehabilitated roads will stimulate agricultural trade over the medium-term. Some types of roads would also provide access for most of the year to regions which are isolated by seasonal rains. Moreover, roads can be justified in terms of food security by connecting the capital to famine regions and by connecting enclaved grain producing regions to markets. Also, roads help to provide access to basic education and health services that are essential to reduce poverty. Road projects should therefore be justified through a broad and inclusive approach to estimating benefits.

35. A major step toward reducing rural poverty would be to increase the share of the world market cotton price received by the farmer through cautious liberalization of the cotton market associated with greater investment in community participation for input supply and cotton

marketing. This should be facilitated by Government fulfilling its commitment, in the Letter of Development Policy of the SAC II, to lift the legal monopoly of Cottonchad on the primary marketing of seed cotton, ginning, and fiber and cotton seed marketing.

36. Formal taxes do not appear high enough, by themselves, to significantly discourage recovery of agriculture. A qualification is that, because of difficulty in communicating the tariff code to agents, it is uncertain what tariffs are actually being imposed on imports of fertilizers, so that tariffs actually paid may be relatively high. The available evidence points the need to reduce informal taxes on transport and taxes imposed by local and traditional leaders. The establishment of law and order on transport routes and among elements that sometimes collect illegal charges on roads would contribute to the expansion of agriculture.

37. It appears that there is considerable potential to improve agricultural incomes through easing the constraints on women. Some options are increased research into food crops raised by women and preparation of female-focused extension messages. Better access to labor-saving technology for household and agricultural tasks such as fetching water and wood would increase productivity by easing time constraints. Another option is to encourage women to form affinity groups to obtain credit or save for economic activities. The most fundamental actions would be to improve basic health and education.

38. To assure that schools are open and that enrollment expands the Government would need to increase funding. The Government would probably not be able, even with the expected petroleum revenues, to sustainably fund a satisfactory increase in primary enrollment. Community participation will therefore be important to complement public funding and to assure that schools operate and that quality improves.

39. Increased funding by itself would not sustainably improve enrollment and educational achievement: that would require an improvement in the quality of education. To this end, the Government could reduce the length of the primary educational cycle, and benefit from informal or multi-class approaches so that learning can actually take place in the village. Moreover, it could harmonize the school calendar with seasonal cycles in the demand for agricultural labor. Some specific steps to increase girls' enrollment would be to provide separate latrines, assure that new school building lowers distances walked to schools, and establish better security for girls through education and supervision of teachers.

40. The Government should redevelop its education strategy, in consultation with civil society and with donors, to assure that it is using its resources efficiently. Such a strategy should propose ways to: (i) reduce the length of primary schooling; (ii) select, train, recruit, and employ teachers; (iii) increase the role of *Associations Parents-Elèves* in school and teacher management; (iv) improve the primary school curriculum and develop Chadian text books; (v) reduce adult illiteracy with large scale adult literacy interventions; (vi) improve the progression rate from primary to secondary school; and (vii) estimate the costs of a basic education program of primary and adult literacy through 2015.

41. To improve public health, the Government could pursue its policy of decentralizing authority and resources in the health system. The Government would also need to continue increasing resources devoted to the sector, although donors are likely to continue to play an important role. These actions would need to be complemented by training of more personnel and their posting in the regions. Women suffer relatively high rates of maternal mortality and this could be reduced by training of more qualified personnel, better access to ante-natal care and a reduction in adolescent pregnancy. The first step to reduce the health consequences of genital mutilation would be an education campaign among religious and civil leaders.

42. Development of petroleum resources offers Chad a unique opportunity to accelerate the implementation of a poverty reduction strategy. The Government has indicated its determination to use additional resources for poverty alleviation and in particular rural development (including infrastructure), health, and education. These public resources will be shared increasingly with decentralized entities and the execution of public expenditures will rely increasingly on these decentralized entities and on non-governmental institutions.

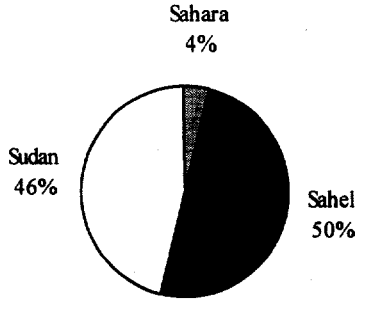
1. STATISTICAL PORTRAIT OF POVERTY IN CHAD

A. NATURAL AND HUMAN BACKGROUND

1.1 The background to poverty is the physical size of the country, which can favor the development of enclaves, and the sometimes harsh natural environment. Chad spans an expanse of 1.284 million sq. km. at the center of Africa and borders the Central African Republic to its south, Sudan to the east, Libya to the north, and Cameroon, Nigeria, and Niger to the west (Map 1.1). Chad can be divided into three principal climatic zones. The southern or Soudanian zone (prefectures of Logone Occidental, Logone Oriental, Mayo-Kebbi, Moyen-Chari, and Tandjilé) is ecologically part of the wet Congo basin; the main crop is cotton, but peanut production is also important and farmers raise food crops such as millet, sorghum, cowpeas (niébé) and taro. The dry Sahel zone lies at the middle of Chad (Chari-Baguirimi, Guéra, Kanem, Lac, Ouaddaï, and Salamat); the main activities are cattle herding and farming of cereals such as millet and *bérbéré* (a form of Sorghum). The Saharan zone lies to the north (Borkou-Ennedi-Tibesti [BET] and Biltine); the main economic activities are dates, camel herding, and transport.

Figure 1.1

Distribution of Population by Climatic Zones



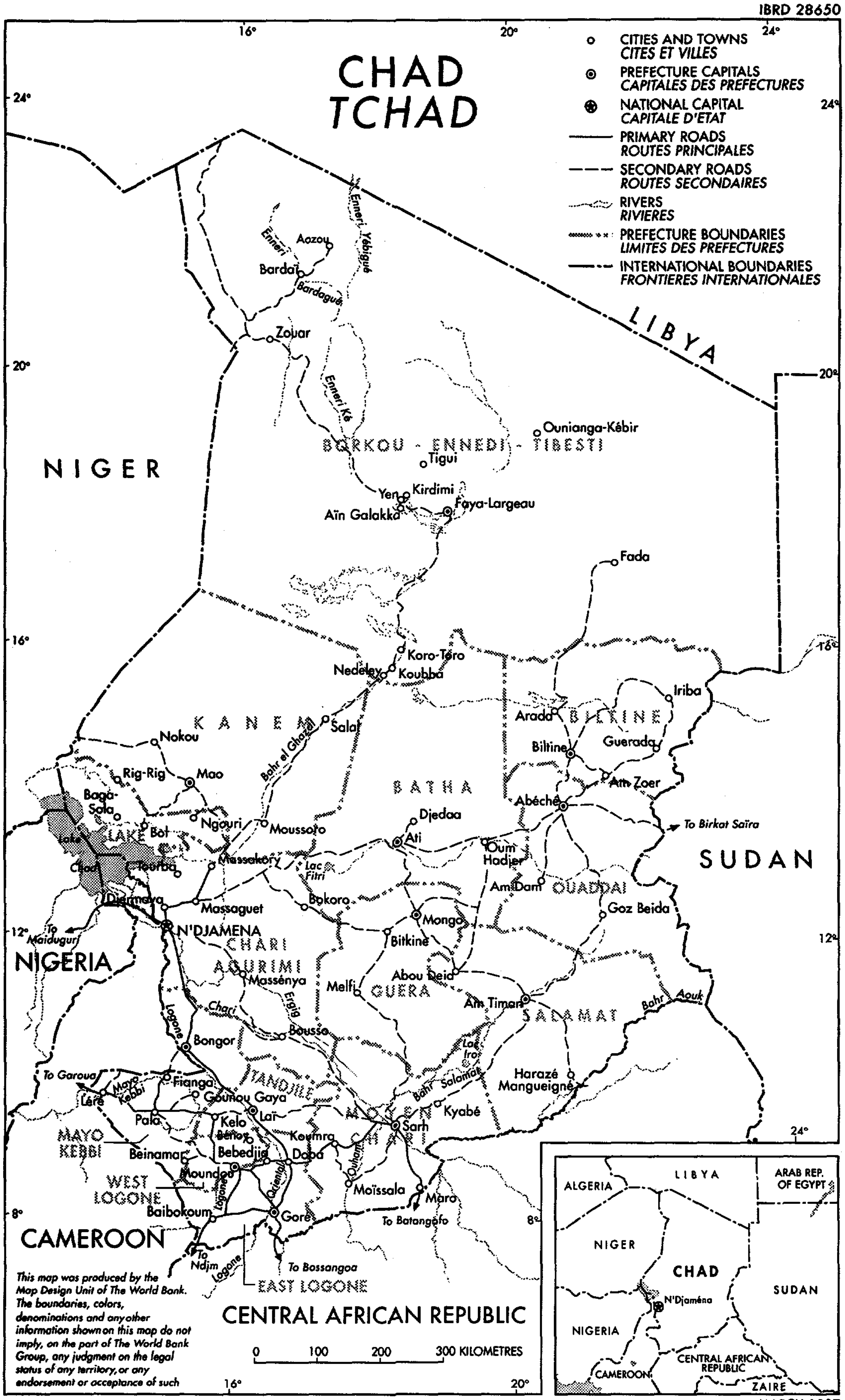
Source: 1993 Census

1.2 The current population of Chad is estimated at 6.8 million, up from the 6.3 million enumerated by the 1993 Census. In 1993, nearly half the population lived in the Soudan and half lived in the Sahel, while only 4 percent lived in the Sahara (Figure 1.1). The population is relatively young with 58 percent of the population under 20 years of age (Annex A Table 1). About 80 percent of the population live in rural areas; still, the 20 percent share of urban population is one of the highest in the Sahel. The population of the capital, N'Djaména, accounts for 40 percent of the urban population.

B. OVERVIEW OF POVERTY INDICATORS

1.3 The best available source of information on the extent and characteristics of poverty in Chad that were available during the preparation of the Assessment were the indicators of living conditions, health, education, and family structure from the 1993 Census. Information from the Census was reinforced by annual government data on education and health as well as data on rural conditions from the Ministries of Rural Development, Agriculture, and Livestock, and the *Office National de Développement Rural* (ONDR). This Assessment drew heavily on the considerable volume of studies by academicians, aid organizations, and development consultancies (Bibliography).

Map 1.1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CHAD
TCHAD
CITIES AND TOWNS
CITES ET VILLES
PREFECTURE CAPITALS
CAPITALES DES PREFECTURES
NATIONAL CAPITAL
CAPITALE D'ETAT
PRIMARY ROADS
ROUTES PRINCIPALES
SECONDARY ROADS
ROUTES SECONDAIRES
RIVERS
RIVIERES
PREFECTURE BOUNDARIES
LIMITES DES PREFECTURES
INTERNATIONAL BOUNDARIES
FRONTIERES INTERNATIONALES
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ALGERIA
ARAB REP. OF EGYPT
CHAD
N'Djaména
ZAIRE
MARCH 1997

1.4 Nevertheless, the paucity of information significantly limited the measurement of poverty in Chad. There has not been a national survey of household expenditures and there does not seem to have been a national survey of nutrition. So it was difficult to measure differences in poverty across regions and to identify groups that suffer from especially severe poverty. A household survey of expenditure and income in four large prefectures was conducted over 1995-96 in collaboration with the UNDP. The results are summarized here but are not fully analyzed, since the survey became available during the final editing of this report.

Table 1.1
Social Indicators in Chad and Selected other Developing Countries

Countries	GNP per-capita in US$	Enrollment in primary education (% of age group)		Population with access to safe water (in %)	Infant mortality rate (per 1000 live births)	Life exp. at birth in years	
		Female	Male			Males	Females
	1995	1994	1994	1994-95	1995	1995	1995
Chad	180	31	62	29	117	47	50
Ghana	390	70	83	56	73	57	61
Nigeria	266	82	105	43	80	51	54
Tanzania	120	69	71	49	82	50	52
Mozambique	80	51	69	28	113	45	48
Kenya	280	91	92	49	58	57	60
Zambia	400	99	109	47	109	45	46
Niger	220	21	35	57	119	44	49
Mali	250	24	38	44	123	48	51
India	340	91	113	63	68	62	63
Sri Lanka	700	105	106	90	16	70	74
Indonesia	980	112	116	63	51	62	66
Colombia	1910	120	118	96	26	67	73
Peru	2310	...	...	60	47	67	72
Sub-Saharan Africa	490	64	77	47	92	50	53
Latin America	3320	...	...	80	37	66	72
South Asia	350	87	110	63	75	61	62

Source: World Bank.

1.5 All the data that are available show that Chad is simply very poor, in terms of every available social and economic indicator and in every region; it is poor relative to the needs of its residents and relative to its neighbors in sub-Saharan Africa, and to other developing countries (Table 1.1). GNP per-capita, for instance was US$180 in 1995 compared to US$490 for sub-Saharan Africa and far below other developing regions such as Latin America and South Asia. The mortality of children under one year in 1995 was 117 per thousand live births compared to 92 for sub-Saharan Africa, 29 percent of the population had access to safe water compared to 47 percent for sub-Saharan Africa, and the illiteracy rate in 1993 was 90 percent, compared to 50 percent for sub-Saharan Africa.

1.6 Poverty is severe in every region if one judges from the indicators of housing quality, access to potable water, and type of toilet, but there are differences. Parts of the Sahel suffer from repeated famines and school enrollment is relatively low. Moreover the Census reports a

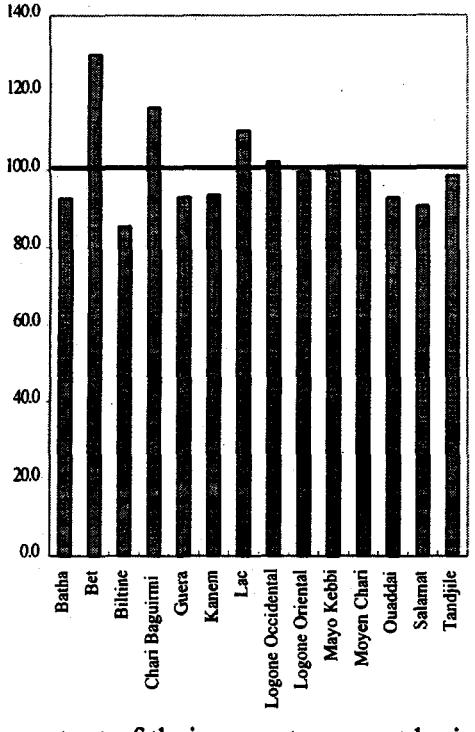
striking shortage of men in the most economically active age groups in parts of the Sahel. In the Soudan zone, school enrollment is relatively high, but several of the health indicators, and in particular survival, are relatively weak.

1.7 Women in particular suffer from poverty as indicated by extraordinary high illiteracy rates and by the health indicators. This may be linked to the loss of male income-earners, among other factors.

C. MALE-FEMALE IMBALANCE AND FEMALE-HEADED HOUSEHOLDS

1.8 The percentage of females in the population is a relatively high 51.5 percent (Annex Table 1). The imbalance is particularly pronounced among the 20 to 59 age group, and especially among cohorts that were in their late teens or early twenties during the civil conflict in the 1980s. The lowest male-female ratio, a striking 77 percent, was recorded among the cohort that was aged between 25 to 29 in 1993.

Figure 1.2
Urban Male-Female Ratio by Préfecture



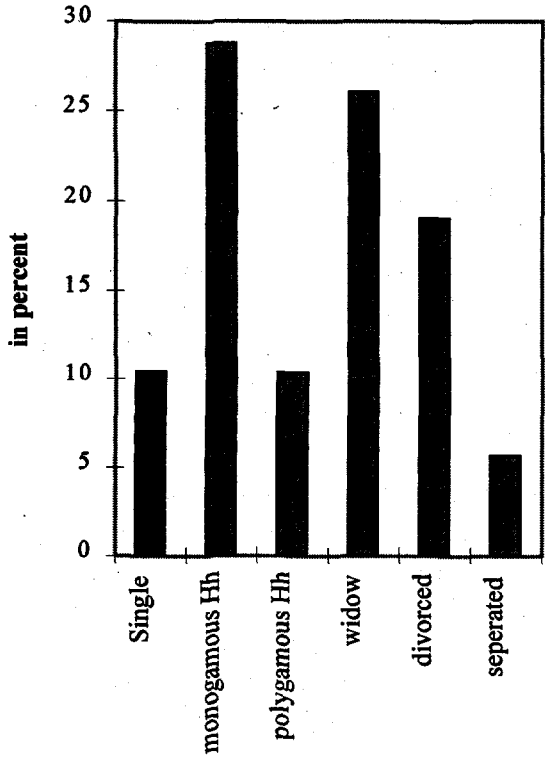
1.9 There is also significant regional variation, with low ratios in regions of the Sahel such as the Biltine, Ouaddai, Salamat, Guera, and Kanem that have been touched by famine and by conflict (Figure 1.2). There are high ratios of males relative to females in the most urbanized prefecture of Chari-Baguirmi and in the sparsely populated BET, where there are many male nomads.

1.10 The death or migration of men led to the emergence of a large number of female-headed households, amounting to 23 percent of the total in both rural and urban areas. The Census reports that more than 50 percent of the female heads of households were widowed, divorced, separated, or single so that they may have lost a male income-earner (Figure 1.3). The presence of married female heads of household may reflect traditionally separate living arrangements rather than loss of a male income-earner. There may be a concentration of poor people in female-headed households which did lose a male income-earner, but the extent of their poverty cannot be independently confirmed since no information was available on the income and expenditure, of this group.

D. LABOR MARKET

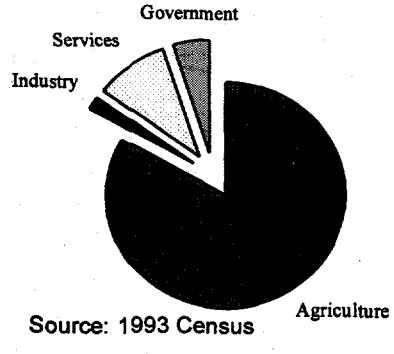
1.11 About three-quarters of the population (72 percent) over 15 is active in the economy. Because of the large proportion of children under 15, about 44 percent of the total population is economically

Figure 1.3
The Distribution of Female Headed Households by Matrimonial Situation



Source: 1993 Census

Figure 1.4
Employment by Economic Activity, 1993



Source: 1993 Census

active. Agriculture, including livestock and fishing, is by far the dominant activity, absorbing the energies of 84 percent of the active population (Figure 1.4).

1.12 Women work mainly in agriculture, where they comprise a slight majority of the labor force, and in services, especially commerce, and informal bars and restaurants; employment in the public sector is overwhelmingly male. (Figure 1.5).

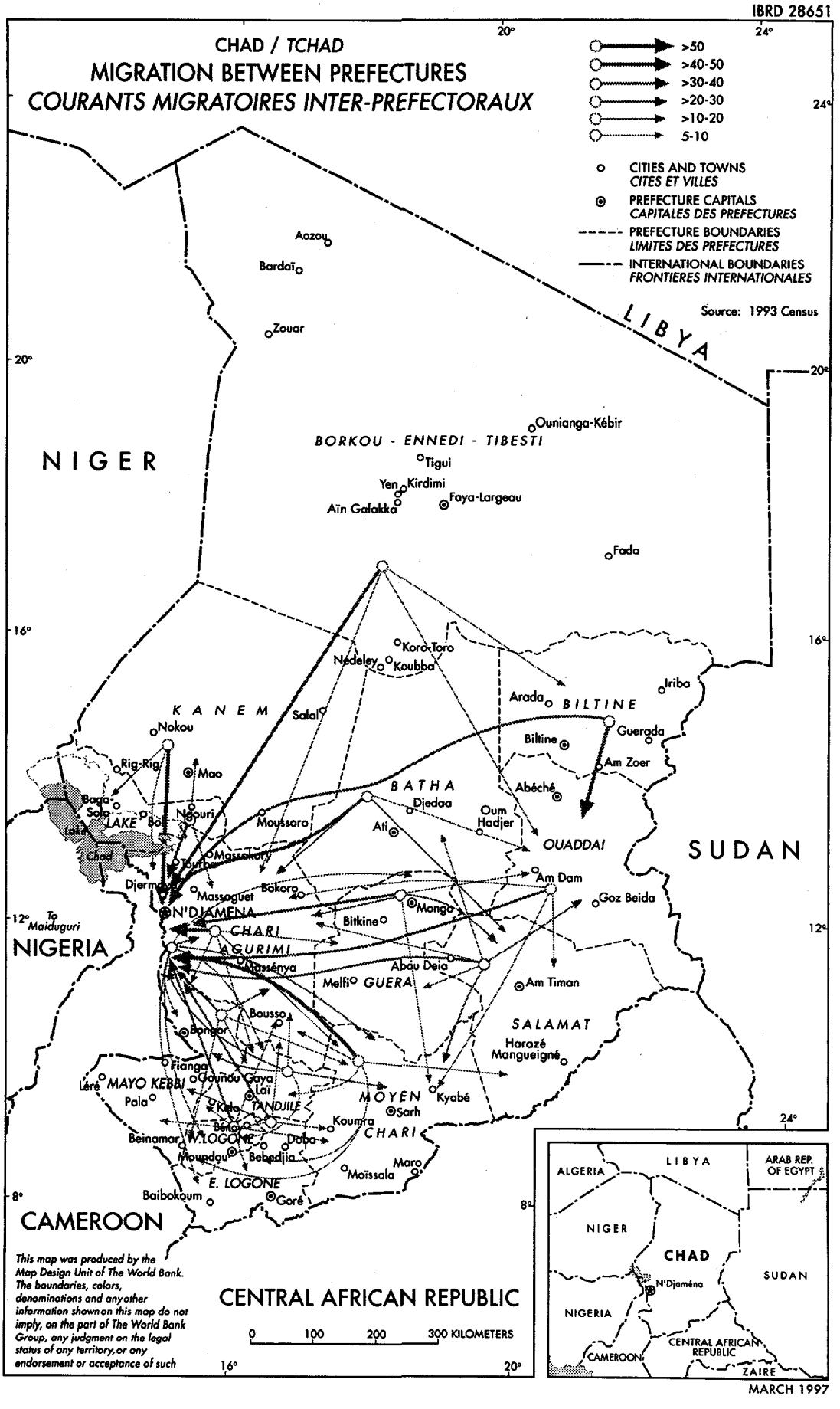
1.13 Open unemployment was very low in 1993, at about 0.7 percentage point, with only about 18,000 persons recorded as unemployed. This probably means that few Chadians have the means to support themselves during full time job-search; as would be expected for a country where the poor are occupied by the struggle for subsistence. Over three-quarters of the unemployed lived in urban areas and 80 percent of the urban unemployed were male.

1.14 The low unemployment rate does not mean that the labor market is efficient. Rather, the market is remarkably segmented by geographical region, with very low rates of migration. The 1993 Census found that the index of residential mobility was 20 percent, that is, 80 percent of the population was born in the sub-prefecture where they resided in 1993 and only 20 percent were migrants (Annex A Table 2). The index does not capture seasonal migration of cattle herders, or migrants that returned to their sub-prefecture of birth. But the index does reflect a remarkable degree of residential stability and rural isolation for a country where migration has been spurred by conflict, climate change, and economic development. Data on direction of the limited migration that did occur show the urban attraction of N'Djaména and the importance of the advance of the Sahara in driving population southward (Map 1.2).

E. HOUSEHOLD LIVING CONDITIONS

1.15 There is widespread poverty in terms of living conditions, as reflected in the indicators of housing, toilets, and water supply collected as part of the 1993 Census. The majority of houses have only one room and very few have more than two rooms (Annex A Figure 1). Most of the

Map 1.2


IBRD 28651
CHAD / TCHAD
MIGRATION BETWEEN PREFECTURES
COURANTS MIGRATOIRES INTER-PREFECTORAUX
>50
>40-50
>30-40
>20-30
>10-20
5-10
CITIES AND TOWNS
CITES ET VILLES
PREFECTURE CAPITALS
CAPITALES DES PREFECTURES
PREFECTURE BOUNDARIES
LIMITES DES PREFECTURES
INTERNATIONAL BOUNDARIES
FRONTIERES INTERNATIONALES
Source: 1993 Census
LIBYA
NIGER
NIGERIA
CAMEROON
CENTRAL AFRICAN REPUBLIC
SUDAN
BORKOU - ENNEDI - TIBESTI
KANEM
BATHA
BILTINE
OUADDAI
LAC
CHARI BAGUIRMI
GUERA
SALAMAT
MAYO KEBBI
TANDJILE
MOYEN CHARI
E. LOGONE
W. LOGONE
N'DJAMENA
Aozou
Bardaï
Zouar
Ounianga-Kébir
Tigui
Yen
Kirdimi
Aïn Galakka
Faya-Largeau
Fada
Koro Toro
Nedelev
Koubba
Iriba
Arada
Salal
Nokou
Guerada
Biltine
Am Zoer
Rig-Rig
Mao
Abéché
Baga-Sola
Djedaa
Oum Hadjer
Nouri
Moussoro
Ati
Massakory
Djermaya
Am Dam
Massaguet
Bokoro
Goz Beida
Mongo
Bitkine
To Maiduguri
Massénya
Abou Deia
Melfi
Am Timan
Bousso
Bongor
Harazé Mangueigné
Fianga
Gounou Gaya
Laï
Léré
Pala
Kyabé
Sarh
Koumra
Beinamar
Doba
Moundou
Bebedjia
Maro
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Baibokoum
Goré
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ALGERIA
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N'Djaména
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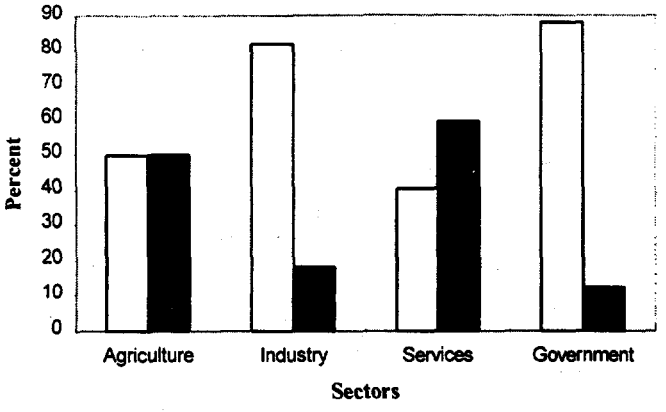
ZAIRE
MARCH 1997

Figure 1.5
Distribution of Employment by Gender and by Economic Activity



Source: 1993 Census

houses have straw roofs, a few are made of mud, and metal roofs are common only in in urban areas (Annex A Figure 2).

1.16 Access to developed pits or even to latrines is very low in all regions (Figure 1.6 and Annex A Table 3). More than 80 percent of households use the outdoors as their main toilet facility. The only, partial, exception, is the Chari-Baguirimi, which includes N'Djaména. The low use of developed toilets would suggest pollution of drinking water.

Figure 1.6

Household Access to Toilets

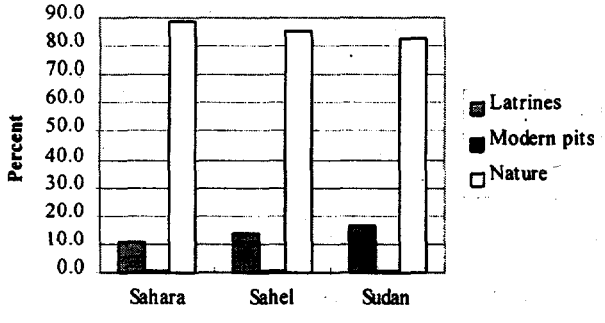
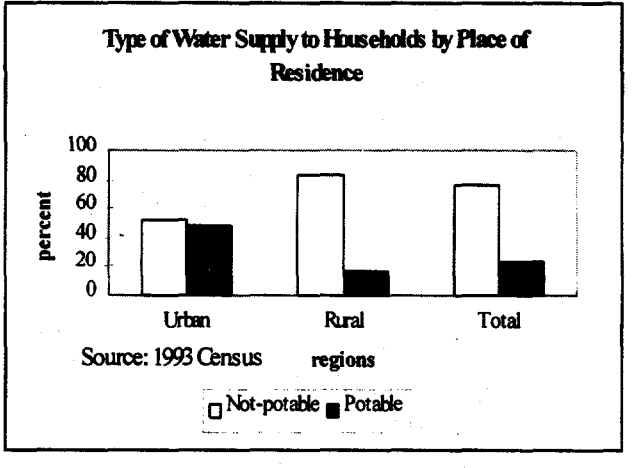


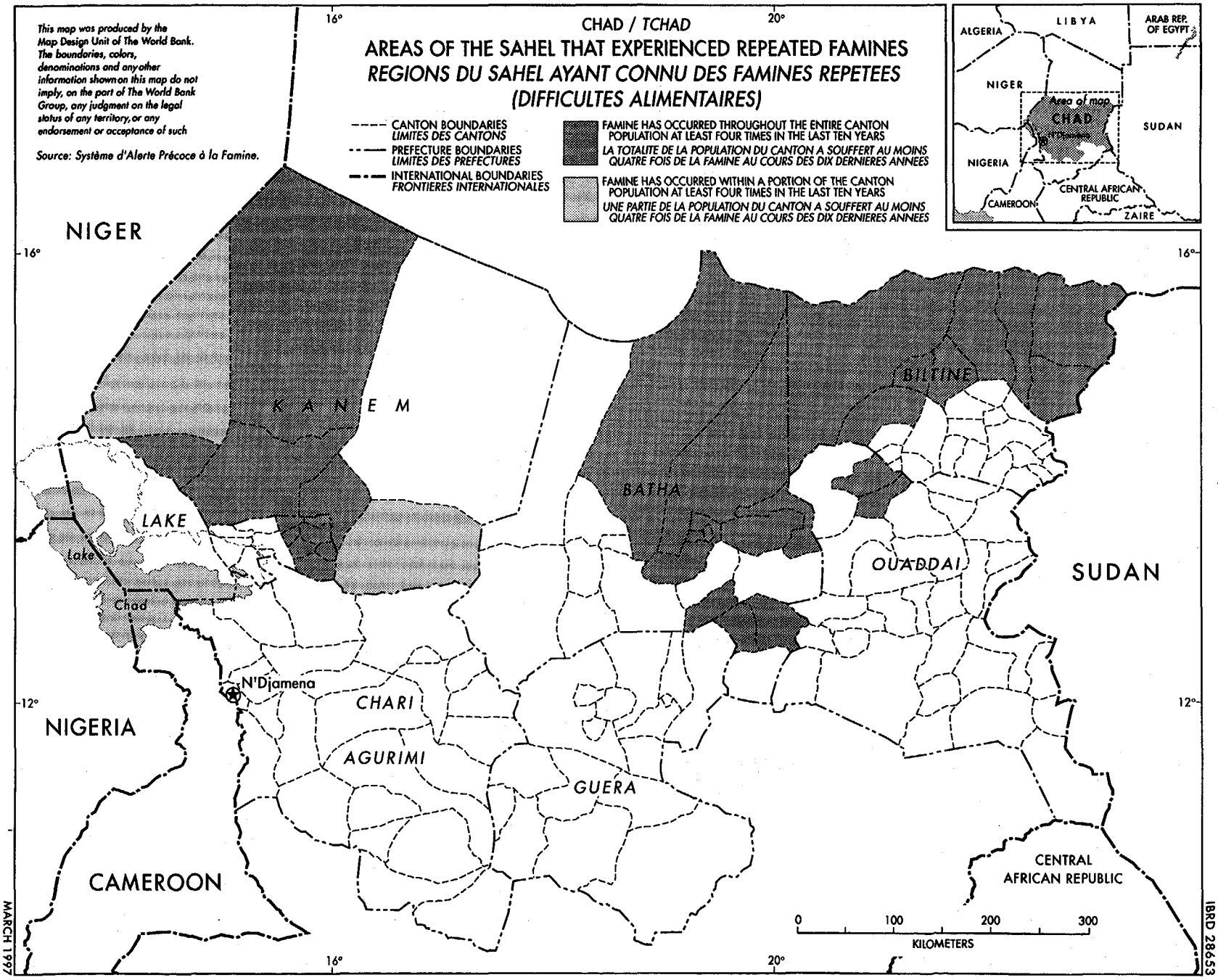
Figure 1.7



1.17 Only about 24 percent of all households had access to a potable water supply, according to the 1993 Census, where potable water is defined as modern wells, fountains, and faucets (Figure 1.7 and Annex A Table 4). Even this may exaggerate access to potable water, since this measure is not based on tests of water quality. As with toilets, access to potable water is low in every region. Even in urban areas more than 50 percent of households use surface water or traditional wells. Access to potable water is particularly low in Ouaddaï, Logone Oriental and Tandjilé.

F. Famine, Nutrition, and Health

1.18 While the data on household living conditions show severe poverty in every region, the surveys of famine and malnutrition provide dramatic evidence of poverty in the Sahel zone in the form of famine and malnutrition (Annex A Table 5). Unfortunately, no surveys of famine and nutrition are available for the Soudan zone.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Source: Système d'Alerte Précoce à la Famine.
CHAD / TCHAD
AREAS OF THE SAHEL THAT EXPERIENCED REPEATED FAMINES
REGIONS DU SAHEL AYANT CONNU DES FAMINES REPETEES
(DIFFICULTES ALIMENTAIRES)
CANTON BOUNDARIES
LIMITES DES CANTONS
PREFECTURE BOUNDARIES
LIMITES DES PREFECTURES
INTERNATIONAL BOUNDARIES
FRONTIERES INTERNATIONALES
FAMINE HAS OCCURRED THROUGHOUT THE ENTIRE CANTON POPULATION AT LEAST FOUR TIMES IN THE LAST TEN YEARS
LA TOTALITE DE LA POPULATION DU CANTON A SOUFFERT AU MOINS QUATRE FOIS DE LA FAMINE AU COURS DES DIX DERNIERES ANNEES
FAMINE HAS OCCURRED WITHIN A PORTION OF THE CANTON POPULATION AT LEAST FOUR TIMES IN THE LAST TEN YEARS
UNE PARTIE DE LA POPULATION DU CANTON A SOUFFERT AU MOINS QUATRE FOIS DE LA FAMINE AU COURS DES DIX DERNIERES ANNEES
ALGERIA
LIBYA
ARAB REP. OF EGYPT
NIGER
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CHAD
SUDAN
NIGERIA
CAMEROON
CENTRAL AFRICAN REPUBLIC
ZAIRE
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16°
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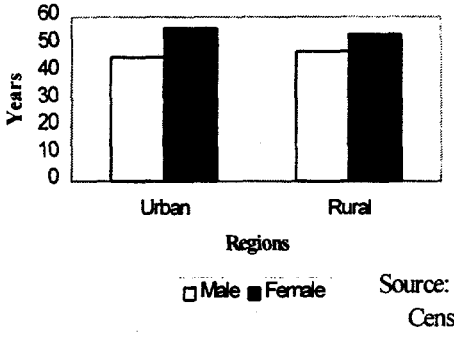
BATHA
LAKE
Lake
Chad
OUADDAI
SUDAN
N'Djamena
CHARI
AGURIMI
GUERA
NIGERIA
CAMEROON
CENTRAL AFRICAN REPUBLIC
0
100
200
300
KILOMETERS
MARCH 1997
IBRD 28653

Map 1.3

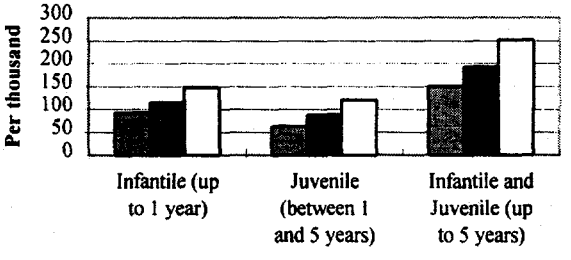
1.19 The most important survey is the monthly survey of 189 cantons in the Sahel zone conducted by the famine early warning system, known as the *Système d'Alerte Précoce* (SAP). The SAP aims at detecting impending famine and on guiding donors' emergency relief efforts; it is conducted by the Ministry of Rural Development with support from the European Community. The survey reports on indicators of famine such as rainfall, the condition of cereal crops, pastures and livestock, food prices and volumes at village markets, population movements, as well as changes in eating habits and nutrition, in each rural district. The frequency of famines predicted by the SAP is a measure of the vulnerability to famine, and thus of lasting poverty. Map 1.3 shows the sub-prefectures where more than four famines *(dificultés alimentaires)* were predicted over 1986-96. The map shows two large pockets of vulnerability: in the Kanem, and in an area that extends over the north of the Biltine and the north and center of Batha.

Figure 1.8
LifeExpectancy at Birth, 1993



Source: 1993 Census

Figure 1.9
Infant Mortality



1.20 The health indicators of poverty are consistent with those suggested by the evidence on nutrition, housing, water supply, and toilets. According to the Census in 1993, life expectancy at birth was 50 years for females and 46 for males, among the lowest in the world (Figure 1.8). The first year infant mortality rate was a relatively high 132 per thousand in 1993 (Figure 1.9). The Soudanian zone has the highest rate of mortality in both the under one and under five year categories. Among the prefectures, Tandjilé has an extraordinarily high rate (Annex A Table 6).

1.21 Infant and child mortality rates are high, in part because of the diseases such as respiratory infections, malaria, and diarrhea that occur frequently in other low-income developing countries (Annex A Table 7). Another reason for the relatively high mortality rates are the relatively low vaccination coverage rates (Annex A Table 8). Chapter 5 presents further information on the health indicators, the health budget, and on health policy.

G. N'DJAMÉNA HOUSEHOLD EXPENDITURE SURVEY OF 1991

1.22 The health, nutrition, and living conditions indicators provide insight into the extent of poverty, but adequate measurement of poverty in economic terms requires a survey of household expenditures. A household expenditure survey for N'Djaména was conducted by Department of Statistics, in the Ministry of Planning in 1991, with support from the World Bank (Roné 1995 and 1996). The survey of 781 households is somewhat out-of-date; moreover, there is some

uncertainty about results which could not be resolved at the World Bank for lack of the necessary electronic files. However the published results are consistent with the social indicators for N'Djaména, and appear internally consistent.

1.23 The survey information on the composition of expenditures is useful in evaluating the impact of tax and transfer policies on the poor. About 44 percent of the average household budget was spent on food, 12 percent on clothing, and 11 percent on housing; only about 3 percent went to health and 1 percent to education. The largest items in food expenditures were cereals (41 percent), meat and fish (18 percent), and drinks and tobacco (10 percent).

1.24 The survey reported a relatively unequal distribution of expenditures. The estimated Gini coefficient, for example, was 0.41 compared to a low-income country average of 0.31. (The coefficient measures inequality on a scale of 0 to 1, with zero representing a perfectly equal distribution). The poorest quarter of all households spent only 6.9 percent of all expenditures and the poorest three-quarters spent 43.8 percent, so that the richest quarter spent 56.2%. So taxes or subsidies on food will have the greatest direct impact on consumption of the poor.

Table 1.2

Poverty Rates by Socio-Economic Group: N'Djaména, 1991

Occupation of head of household	Poverty rate (P0) in % points	Share of poor households in total in % points
Producers: Informal [a/]	80.5	15.7
Traders: Informal sector [b/]	81.9	20.4
Proprietors: Modern formal sector [c/]	63.2	2.4
Professionals [d/]	52.2	3.1
Salary earners: Private sector [e/]	75.5	12.5
Salary earners: Public sector [e/]	72.5	14
Economically inactive persons	80.6	31.9
Total	77.8	100

a/ farmers, herders, and small producers
b/ small suppliers and small traders;
c/ heads of industrial and commercial businesses and senior managers
d/ independent professionals
e/ Mid-level managers, employees, wage earners, service workers, salary earners in agriculture.

Source: Roné (1996).

1.25 The survey reports a poverty rate of a bit over three-quarters in N'Djaména, which the social indicators from the Census suggest is one of the richest parts of the country. An extrapolation would then suggest that about 61,000 households in N'Djaména fell below the poverty line. The line of 67,525 FCFA per month for a family of five is a rough estimate of the budget for biologically necessary basic foods, as well as minimum supplies of clothing, and housing, water, and energy. This definition is inevitably somewhat arbitrary, as are other definitions of the poverty line. But it does appear reasonable and comparable to those used in other studies: the line is equivalent to US$1.48 per day per person in 1991 prices, which may not be far from the US$1 per person day in 1987 purchasing power parity prices that have been used in international comparisons. It was not possible to calculate poverty rates using a lower poverty line because the electronic files were not available, although this may have revealed greater variation in poverty.

1.26 According to the survey, the highest poverty rates, of over 80 percent, were found among households headed by producers and traders in the informal sector and by economically inactive persons, that is, persons that are unemployed or are not searching for employment (Table 1.2). These three groups comprised 68 percent of all households and about 71 percent of the poor. The lowest poverty rates were found among professionals and proprietors of formal businesses. The survey also reported that the poverty rate was highest in the fifth arrondissment, and lowest in the first (Table 1.3).

Table 1.3
Poverty Rates by Arrondissement: N'Djaména, 1991

Arrondissement	Poverty rate (P0) in % points	Average monthly expenditure per household (in FCFA)
1	57.1	119,138
2	78.3	121,510
3	66.7	118,517
4	74.1	94,205
5	84.2	88,757
Total	**72.08**	**108,425**

Source: Roné (1996)

1.27 The survey included questions on education and on health alongside those on expenditure and revenues. The rate of school enrollment was 55.5 percent in N'Djaména in 1991, with 50.7 percent of girls and 59.8 percent of boys. The lowest rates were observed among producers and traders in the informal sector (36.3 and 37.5 percent). Strangely, the net rate of primary school enrollment was higher among the poor (66.7 percent) than among the non-poor (50.7 percent).

1.28 Turning to health, the monthly incidence of disease was 15.5 percent: the most effected groups were households headed by inactive persons (17.8 percent) and private sector salary earners (16.9 percent). Moreover women suffered an incidence of 16.7 percent, compared to 14.4 per cent among men; this tendency was most marked for the 25-49 year old group where women suffered an incidence of disease of 21.3 percent compared to 15.4 percent for the men.

H. Assets, Incomes, and Expenditures of Rural Households in the Cotton Zone

1.29 Poverty can be defined in terms of lack of assets, as well in terms of income and expenditure.. Data from the ONDR show that farmers in the Soudan are indeed very poor in terms of agricultural implements. A survey found that only about 30 percent of households in the cotton zone had plows. In another study, the ONDR measured poverty in the cotton zone based on ownership of draft animal units and animal traction equipment, typically an ox and a plow (CIRAD, 1996). With less than 1 animal unit and without a plow, a farmer was considered extremely poor, with 1 to 5 units, a farmer was considered poor. Under these standards, 60 percent of farmers were extremely poor and 15 percent were poor.

1.30 A survey of villages in the cotton zone in 1994-95 showed a very low level of cash incomes --in the zero to US$280 range (Annex A Table 9). The survey also showed that cash incomes and expenditures were higher for farmers that grew cotton and had animal traction. Another survey, that focused on expenditures, also shows the importance of cotton and animal traction (Annex A Table 10).

I. THE ECOSIT SURVEY OF URBAN AND RURAL AREAS

1.31 A household expenditure survey, the *Enquête sur la Consommation des Ménages et le Secteur Informel au Tchad* (ECOSIT), was conducted from June 1995 to June 1996 by the Chad Department of Statistics and the UNDP The survey was of 2,699 households in the four largest cities, N'Djaména, Moundou, Sarh, and Abéché, and in the entire rural area of the prefectures where the cities are located: Chari-Baguirmi, Logone Occidental, Moyen Chari, and Ouaddai. The results for urban areas are more reliable because 2,311 of the sample were urban households and only 387 were rural.

1.32 One of the most significant insights provided by the ECOSIT is the size and nature of the informal system of social security (through transfers made out of family and community solidarity) Transfers excluding borrowing are about a quarter of revenues excluding transfers in urban areas and almost a fifth in rural areas

Table 1.4
ECOSIT: AVERAGE HOUSEHOLD REVENUES AND EXPENDITURES IN 1995/96
(CFAF per person per year)

	Chad	Rural	Urban
TOTAL REVENUES	98,193	72,762	187,897
Current revenues excluding transfers	78,992	61,348	141,228
Agriculture (monetary)	21,057	25,159	6,588
Salaries	10,288	623	44,378
Non-monetary revenues (incl. non-comm. agr.)	15,385	18,268	5,215
Revenues from property	4,430	1,111	16,137
Revenues from the informal sector	27,832	16,186	68,910
Transfers received, excluding borrowing	14,886	8,694	36,728
Borrowing	4,315	2,720	9,941
TOTAL EXPENDITURES	98,670	75,662	179,825
Current expenditures excluding transfers	91,184	69,902	166,254
Food	58,297	49,402	89,673
Non-food, *of which*	32,887	20,500	76,581
Health	4.323	2,834	9,576
Hygiene	5,312	3,649	11,178
Education	810	358	2401
Transfers excluding loans	4,506	3,347	8,593
Loans and reimbursement	2,980	2,413	4,978
Savings	-1,812	-3,207	3,109

Sources: Chad Department of Statistics and UNDP.

Table 1.5
ECOSIT: AVERAGE EXPENDITURES BY REGION
(Weighted average CFAF per person per year)

Regions	Expenditures
Rural Chari-Baguirmi	99,209
N'Djaména	220,909
Rural Logone Occidental	67,099
Moundou	134,425
Rural Moyen Chari	62,774
Sarh	128,538
Rural Ouaddai	86,919
Abéché	162,011

Sources: Chad Dept. of Statistics and UNDP.
Note: Prefectures of Chari-Baguirmi, Logone Occidental, Moyen Chari, and Ouaddai.

(Table 1.4 and Annex Table 11). Transfers received as revenues are much higher than those recorded as expenditures, indicating that most of the transfers are from Chadian migrants abroad, who are mostly in the Arabian Peninsula. The detailed revenue tables show that the transfers are usually made on traditional occasions such as weddings and funerals (Annex Table 12). Expenditures on health and hygiene are relatively strong, and are much higher in urban areas, but expenditures on education ore relatively modest.

Table 1.6
ECOSIT: DISTRIBUTION OF HOUSEHOLD REVENUES BY QUINTILES
(Average CFAF per person per year, from poorest to richest quintile)

	Chad	Rural	Urban
Quintiles (groups of 20% of the pop.)			
First	67,513	45,779	111,473
Second	93,313	75,226	129,813
Third	100,374	65,420	171,071
Fourth	171,925	113,617	289,861
Fifth	309,372	194,125	542,474

Sources: Chad Department of Statistics and UNDP.

1.33 Table 1.5 summarizes the regional differences in expenditure. Chari-Baguirmi, where N'Djaména is located, is relatively rich while the Logone Occidental and Moyen-Chari are relatively poor. Table 1.6 summarizes the distributing of income in the sample. The ratio of the income of the highest quintile of the population (group of 20% of the population) to that of the lowest group is 4.9 in urban and 4.2 in rural areas. Annex Tables 13 and 14 show the region breakdwon of the distribution of revenues and of expenditures.

Table 1.7
ECOSIT: PRELIMINARY ESTIMATE OF THE FOOD POVERTY RATE
(percent of the population)

Total sample	64
Rural	67
Urban	63
Rural Chari-Baguirmi	59
N'Djaména	64
Rural Logone Occidental	80
Moundou	63
Rural Moyen Chari	66
Sarh	81
Rural Ouaddai	70
Abéché	40
Note: Total non-food poverty rate	25
Rural	35
Urban	22

Sources: Chad Dept. of Statistics and UNDP.
Note: Prefectures of Chari-Baguirmi, Logone Occidental, Moyen Chari, and Ouaddai.

1.34 The Department of Statistics and the UNDP made an estimate of the rate of poverty that should be considered preliminary (Table 1.7). The rate of food poverty is the percentage of the population whose expenditures on food are below the amount necessary to purchase a biologically necessary number of calories. This figure was estimated as 63,120FCAF per person per year in 1995-96. The food poverty rate is about two-thirds, and is only slightly higher in rural than urban areas (Annex Table 14). This is inconsistent with other indicators of urban-rural poverty and calls into question whether the sample size for rural areas was adequate. The Department of Statistics and UNDP also made a rough estimate of the minimum required non-food expenditures (16, 315FCAF per person per year). A quarter of the population is poor by this standard and rural poverty is significantly higher in urban areas.

2. CONSTRAINTS TO AGRICULTURAL INCOMES

A. AGRICULTURAL ACTIVITIES AND INCOMES: NATIONAL OVERVIEW

2.1 Any strategy to reduce the poverty documented in the previous chapter must consider constraints to agricultural growth to take effective actions that will benefit the poor. The reason is that agriculture and livestock production are the primary engines of growth in Chad. They employ more than four-fifths of the labor force and contribute about one-third to nearly one-half of national income, depending upon the degree to which food and agriculture-related industry and services are included.

2.2 The value-added of broadly-defined agriculture was over 45 percent of GDP in 1995, according to preliminary estimates from a Department of Statistics project supported by the UNDP. Food crops accounted for about 15 percent of Chad's GDP, industrial crop production (cotton, gum Arabic, tobacco, and sugarcane) for 4 percent, and livestock for 16 percent. The contribution of broad agriculture is calculated by adding closely linked activities such as cotton lint, oil and soap, sugar, animal slaughter, tobacco, and beverages.

2.3 Cotton crops and cotton lint have only a 10 percent share in the broad definition of agricultural GDP. Yet the importance of cotton cannot be denied: cotton contributed 50 percent to the value of exports and 25 percent to government revenues. The cotton sub-sector helps sustain some 345,000 farm households and more than 2,000 salaried workers at Cottonchad. More important, perhaps, cotton is the major contributor to farm cash income because it remains the main commercial crop in Chad.

2.4 Nonetheless, a poverty reduction strategy must consider other crops and livestock as well. Cotton is produced only in the cotton zone of the Soudan, and even in the zone, only about one-third of the planted area is in cotton. ONDR surveys in the zone indicate that on average, cotton accounted for about two-fifths of gross farm revenue in 1995, while sorghum, groundnuts and peanuts contributed almost half of the total. During the 1992/93 farming season, peanuts alone surpassed cotton production as a contributor to agricultural incomes as farmers shifted from cotton to peanut production because of low producer prices and difficulties in collecting payment during the previous season.

2.5 Livestock is a very significant source of income, of recorded exports, and of dynamic growth in agriculture --especially since the devaluation of the CFAF. Livestock also comprise the largest asset in agriculture, and are sometimes treated as a store of wealth rather than of ready cash, except for small ruminants, milk, and poultry products. This Assessment does not fully analyze this important industry because of a lack of data, especially of the size of herds and of unrecorded exports.

2.6 Moreover, much of the statistical information on cotton, and other crops required for analysis of agricultural incomes and expenditures in Chad is not available. Therefore, this chapter draws on finding from existing data sources, field visits, interviews, and on a review of the literature. There is nevertheless some information on the significant regional diversity of agricultural activities.

B. AGRICULTURAL ACTIVITIES AND INCOMES: THE SAHEL AND SOUDAN REGIONS

2.7 Ecological conditions dictate the make up of the main agricultural activities across regions.[1] As in other countries of the Sahel, rainfall and the availability of irrigation dominate agriculture: in Chad millet grow under 100-300 mm rainfall; sorghum and cow peas under 300-800 mm rainfall; and cotton, rice, and tuber crops under 800-1200 mm rainfall.

2.8 Chad is different from other Sahel countries in that there are vast seasonally flooded areas and a special micro-climate around Lake Chad --one of the largest lakes in Africa. Irrigation and receding water in flooded areas allow *bérbéré* (a traditional sorghum), rice, and vegetable production in the Sahel; and *bérbéré* and rice production in the Soudan zone.

2.9 Lake Chad has been shrinking over the last twenty years because of recurrent droughts. This has had world-wide consequences for the climate and for fauna, since the lake is a stopping point for certain migrating birds, such as storks. While this has hurt local fisheries, it has opened opportunities for diversified crop and vegetable production. On the rich, loamy soils uncovered by the seasonal retreat of the Lake's waters, farmers now grow abundant sweet potatoes, maize, and confectionery sugarcane, which are marketed in N'Djaména. This provides Chadian farmers with a way of coping with drought with little capital investment (Hecht et al, 1993).

2.10 The Commission of the Lake Chad Basin (CBLT) has developed a plan to address the problems of the lake. This includes action through a Global Environment Fund project with World Bank co-financing, an integrated development project financed by the Islamic Bank, and a project financed by the German Trust Fund for underground water. An older project that aims at directing part of the waters of the Oubangui in the Central African Republic to feeding Lake Chad is being relaunched.

2.11 The main crops in the Sahel zone in 1995/96, in metric tons (mt), were sweet potatoes (576,000 mt), sorghum (150,000 mt), manioc (148,000 mt), and millet (142,000 mt, Annex A Table 16). The Sahel is traditionally the livestock production region *par excellence*, though traditional herding involves considerable migration to the Soudan zone. With persistent and recurrent droughts, more and more livestock production has shifted from the north to the south. The main food crops in the Soudan were sorghum (287,000 mt), peanuts (206,000 mt), and millet (101,000 mt). Production of the main industrial crop, seed-cotton was 160,000 mt.

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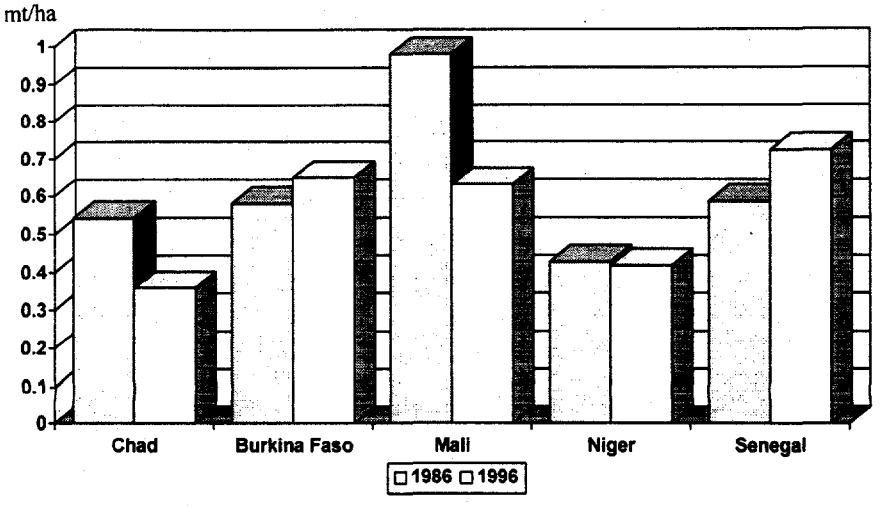
[1] In ecological terms, the Sahel and Soudan zones traverse administrative borders. For example, the northern parts of the Kanem, Batha, and Biltine belong to the ecological Sahara; the north of the Mayo Kebbi to the ecological Sahel; and south of the Salamat to the ecological Soudan

Figure 2.1

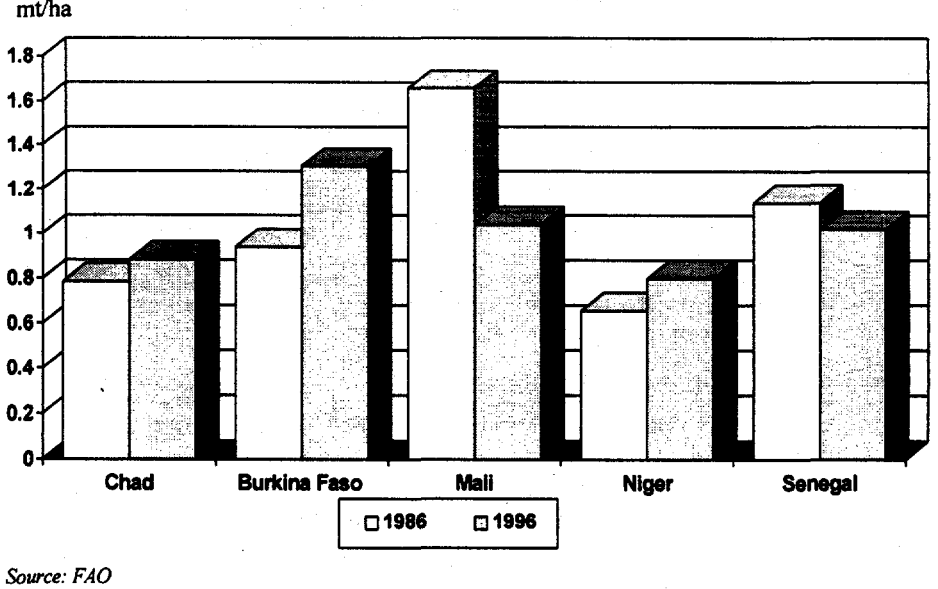
Millet Yields in Chad are Low



Source: FAO

2.12 With regard to crops, one of the most fundamental facts is that yields are low in both the Sahel and Soudan zones, even when compared to similar parts of Sub-Saharan Africa (Figures 2.1 and 2.2) For example, the 1994 millet yield was 668 kg per ha in Mali's Sahel Region, and 862 kg per ha in its Soudan region, compared with Chad's 305 kg per ha and 581 kg per ha in similar regions. However, maize yields in Chad on the rich recession soils of Lake Chad without fertilizer are close to that of Mali in the Soudan region with use of modern inputs (respectively 1,200 kg per ha and 1,400 kg per ha). Cotton yields have remained stagnant at 700 kg per ha in Chad, while they reach over one ton per ha in Cameroon, Mali, and Benin. The best yields of

Figure 2.2
Maize Yields in Chad are Low



Source: FAO

irrigated rice, as opposed to rice grown on flood plains, average about 3 tons per ha, while they are over 4 tons in Mali's *Office du Niger.*

2.13 Livestock production data are unreliable because the number of head is calculated along a constant trend line. Based on 1976 and 1980 estimates, the Ministry of Livestock assumes an average annual growth rate of 2.4 percent for cattle, 3 percent for small ruminants, and 5 percent for hogs (CIRAD, 1996). According to official estimates, the Soudan zone, with 10 percent of the land area, has 18 percent of the cattle (Annex A Table 17) A recent study in the Moyen Chari suggests that cattle herds are also increasing in the Soudan zone, as herds grew by 36 percent from 1972 to 1993 (CIRAD, 1996).

C. ROADS

2.14 Chad is a land-locked country more than twice the size of France with poorly maintained roads. Physical isolation, or enclaves, is one of the causes of the high transport costs and the wide gap between producer and final consumer prices. Chad has many agricultural enclaves: the Salamat area has high agricultural potential and could potentially serve a number of urban markets to the northwest (N'Djaména), the northeast (Abéché) and the south (Sarh, Moundou, and Guelendeng). Without improved transport infrastructure and equipment, transport costs will probably not be brought low enough to improve the commercialization of agricultural products from these regions.

Box 2.1

Rural roads in Chad and Selected African countries.

Rural roads in Chad comprise 77 percent of the total road network, whereas in 1991 the proportion was 58 percent in Nigeria, 53 percent in Malawi, 52 percent in Kenya, 39 percent in Senegal, 35 percent in Cameroon, and 32 percent in Tanzania (Riverson et. al. 1991).

Assuming that all 24,000 km of roads are in the Sahel and Soudan region, the density of rural roads in Chad is about 34 m per km., still below that of 50 m per sq. km. in Cameroon, 59 m per sq. km. in Malawi and 85 m per sq. km. in Kenya. Even those higher densities are considered far from full coverage.

2.15 Chad's road network is sub-par compared to several Sub-Saharan countries (Box 2.1). Furthermore, because of the rainy season, there are pockets of surplus production, where foodstuffs sit in storage because they cannot be sent to consumption centers, and there are pockets of deficit production, where food cannot be delivered for months. Several studies link poor road infrastructure to high transport costs, and the high transport costs to high consumer prices and low producer prices. For example, Herman et al. (1994) find that transport charges accounted for 60 to 75 percent of explicit marketing costs.

2.16 Transport charges of millet and sorghum in 1996 represented between 30 percent and 80 percent of the gross margin between rural prices and prices in the N'Djaména consumer market (Table 2.1). For the higher-valued gum Arabic transported from Dourbali to N'Djaména, transport

cost represented about 10 percent of the price spread between the producer and export price (Annex A Table 18). Local transport from field to farm is also expensive. Farmers pay CFAF 2,500 to 3,500 per cart load (400 kg) to transport cotton from the field to the farm usually, a distance of less than 5 km, and CFAF 1,500 from the farm to the cotton purchasing center, regardless of the distance.

2.17 Chad's road infrastructure consists of about 7,300 km of 'classified' roads, of which about 4,700 constitute the priority network, most of which are unpaved and in poor condition, and 24,000 km of 'unclassified' rural tracks. Classified roads are the responsibility of the central government, while unclassified rural tracks are left to local governments and authorities to maintain. In 1996, of the classified roads, the Chadian Government and donors identified 3,769 km

Table 2.1
Transport Cost as Percent of Gross Margin in the Supply of Food Crops to N'Djaména, 1995 -96
(in CFAF)

1995

Product	Wholesale Supply Market	Producer Price At Market	Transport To N'Djaména	Consumer Price	Gross Margin	Transport % of margin
Bérbéré	Am Timam	34	25	87	53	47.17%
Millet	Bokoro	62	10	101	39	25.64%
Rice	Kelo	155	25	259	104	24.04%
Sorghum	Benoye	54	35	96	42	83.33%
Maize	Dibinintchi	77	15	95	18	83.33%

1996

Product	Wholesale Supply Market	Producer Price At Market	Transport To N'Djaména	Consumer Price	Gross Margin	Transport % of margin
Bérbéré	Am Timam	71	25	137	66	37.88%
Millet	Bokoro	128	10	156	28	35.71%
Rice	Kelo	239	25	301	62	40.32%
Sorghum	Benoye	54	35	96	42	83.33%
Maize	Dibinintchi	141	15	161	20	75.00%

Source: *Annuaire statistique des prix des cereales et legumes.*

as main-priority roads and 899 km as second-priority roads. The main-priority road network is defined as the minimum needed to adequately link N'Djaména with major domestic centers, while the second-priority road network is meant to link regional or local centers. Some 1,821 km of the main-priority road network are in the Soudan zone, 1,287 km in the East Sahelian zone and 226 km in the Lac-Kanem zone (BIEP, 1994). The balance is in the Chari-Baguirmi, which includes N'Djaména. The 24,000 km of unclassified track include some 5,700 km of feeder roads in the cotton producing area. Cottonchad, the vertically-integrated cotton para-statal, has a mandate to maintain 5,250 km of these tracks.

2.18 The devastating 1972-82 civil war left Chad with only 30 km of paved roads in 1986. Since then, successive road rehabilitation projects have improved the road network, but much

remains to be done. Today, Chad still has only 263 km of paved roads, which represent 7 percent of the main-priority road network. Another 37 percent of the main-priority road network is in good condition and consists of laterite or gravel roads. That is, more than half of the main-priority road network (56 percent) consists of earth roads, which are highly susceptible to damage through heavy vehicles during rains. Out of the 899 km of second-priority road network, only one road is in laterite (Annex A Table 19). A new paved road is being built between Guelendeng and Kelo, still leaving the Kelo - Moundou section unpaved. A major producer of grains and known as the potential breadbasket of Chad, the Salamat is largely unreachable for 6 to 8 months of the year because of poor roads and the isolating effects of the high rainfall. The Abou Deia - Am Timan road presently under construction is likely to improve this situation.

2.19 Many of Chad's unpaved roads are in poor condition. Road condition, and the speed with which roads deteriorate, are closely related to the road's soil sub-base, unless the road is reinforced with foreign material. In Chad, the road sub-base often favors road deterioration since most of western and southern Chad is a large depression through which the Chari and Logone rivers drain into Lake Chad. East of the Chari lies a vast lowland, a large part of which retains rainwater some time after the end of the rainy season. In the south, the Chari and Logone rivers regularly flood the large expanse of land that they border. These flooded areas are mostly loamy-clay and sandy soils that make the road sub-base's highly susceptible to rains. Even in the dry season, it takes 8 hours for a four-wheel drive vehicle, the only type possible, to travel the 350 km between N'Djaména to Bol. On the other hand, gravel and laterite soil formations to the southwest and northeast of the depression make good road foundations. For example, the laterite road from Sarh and Moundou to Cameroon border road compares favorably with any other sub-Saharan African road of similar type (DAI, 1993). Indeed, it is truly the only unpaved road open without restrictions to freight traffic all year around.

2.20 Godo Godo (literally porridge), a village 23 km from N'Djaména on the road to Dourbali, used to be a testimony to the poor condition of Chad's roads during the rainy season. Rains turn most earth roads, particularly those built on foundations of loamy-clay soils, into mud traps where heavy trucks are stuck for hours or even days. Very often, roads are cut by ravines, and bridges are destroyed. In the ouaddis, vehicles run the risk of being swept away by flash floods. Overloaded trucks further damage the roads.

2.21 To limit the deterioration of unpaved roads during periods of rain, the authorities impose traffic restrictions for vehicles with a weight over 3.5 tons from May 1 until the end of the rainy season. Rain barriers are set up on all unpaved roads; vehicles may not circulate during rains and during a waiting period after the rain. Waiting periods vary according to road types and conditions, and type of vehicles. On earth roads, it may take 2 to 3 days before trucks are allowed back on the road; on laterite roads, it may take as little as 6 hours. In 1994, a total of 276 rain barriers were installed on Chad's road network (BIEP, 1993). Only the road from Sarh and Moundou to Cameroon and the road from Sarh and Lasido to the Central African Republic are open to heavy trucks throughout the year. Including paved roads, Chad must function with only 26 percent of the main and second priority road network during the rainy season. Unfortunately, these mitigating measures are often violated by transporters and individual vehicle users. Some of them willingly bribe officials for passage, perhaps the most telling

indicator of the value placed on the lost time and lost perishable goods. Consequently, roads are further damaged and transport costs escalate.

2.22 The Second Transport Sector Program (PST 2) calls for the Government to assure 100 percent of all routine maintenance, and 5 percent of periodic maintenance. Routine maintenance consists of filling holes and scraping the road surface, without any major foreign material brought to strengthen the road. Periodic maintenance involves works which are designed to reestablish the road according to its original specifications. The Government has contracted with the semi-public *Société Nationale de l'Entretien Routier* (SNER) for routine maintenance of 50 percent of the road network, including all paved roads and 669 km of second-priority roads. Four private companies share the balance of the routine maintenance. Revenue for road maintenance comes from user fees (tolls on ferries and bridges, freight taxes collected by BNF), contribution from taxes on petroleum products, and budget allocations. The *Compte Autonome d'Entretien Routier* (CAER) was created to manage these resources.

2.23 About 91 percent of the laterite roads and only 32 percent of earth road of the main-priority road network are currently scheduled for periodic maintenance. The Transport Sector Adjustment Project [PASET] rehabilitated 2,800 km of the 3,800 km of the main priority road network. The second project 1994-98 calls for an extension of the main priority road network to 4,725 km by including some rural roads for agricultural purposes.

2.24 Cottonchad and cotton producers have agreed to share the cost of maintaining cotton feeder roads. Cottonchad is to maintain bridges, and the producers to maintain tracks. During field visits, farmers reported constraints in transporting gravel to repair major potholes. They also complained, along with local transporters, that Cottonchad has not lived up to its agreement. Transporters and travelers report that one of the priority roads linking Lere, Pala, Fianga, and Bongor has been left to deteriorate since the mid 1970's. Even in the dry season, it takes three hours to travel the 72 km from Pala to Fianga, on the second priority road network.

2.25 The country's transport fleet which consists of about 1,000 heavy trucks, is 15 years old on average and is also in a poor state (BCEOM, 1996). Except perhaps in foreign-managed transport companies, transport vehicles are bought second hand, imported from Nigeria, Cameroon, Libya, or Belgium. Short haul (150 km radius) freight is carried by pick-up trucks of less than 3.5 ton capacity; long distance freight (above 150 km) is carried by heavy trucks above 7 ton capacity. In the sandy north, trucks above 5-ton capacity are rare. On feeder roads and rural tracks to market, ox and horse cart can haul up to one ton, while camels carry up to 0.2 to 0.4 ton and donkeys up to 0.1 or 0.2 ton. The country's transport fleet is concentrated in the Chari-Baguirmi (83 percent), Mayo-Kebbi (6.5 percent), West Logone (4.1 percent), and the Kanem (0.3 percent) according to BIEP (1991). Poor road conditions contribute to breakdowns which sometimes require expensive parts. Thus road conditions worsen the condition of the transport fleet and increase transport costs.

2.26 Field visits also identified cases demonstrating the benefits and returns to infrastructure improvements. For example, interviews in the Karal area in the Chari-Baguirmi showed that improved market access brought by the newly paved road has increased agricultural incomes

from sale of sweet potatoes, maize, cowpeas, and vegetables. The increased incomes have significantly contributed to a better quality of life in the village. Producers have been able to make down payments for the construction of a school, a dispensary, and a producer group warehouse and meeting house. In addition, producers have contributed to the supply of potable water by improving and maintaining six fountains in the village. Casual observation shows that housing has improved in Karal, from thatch huts to mud brick houses, with even the advent of some cement-brick houses.

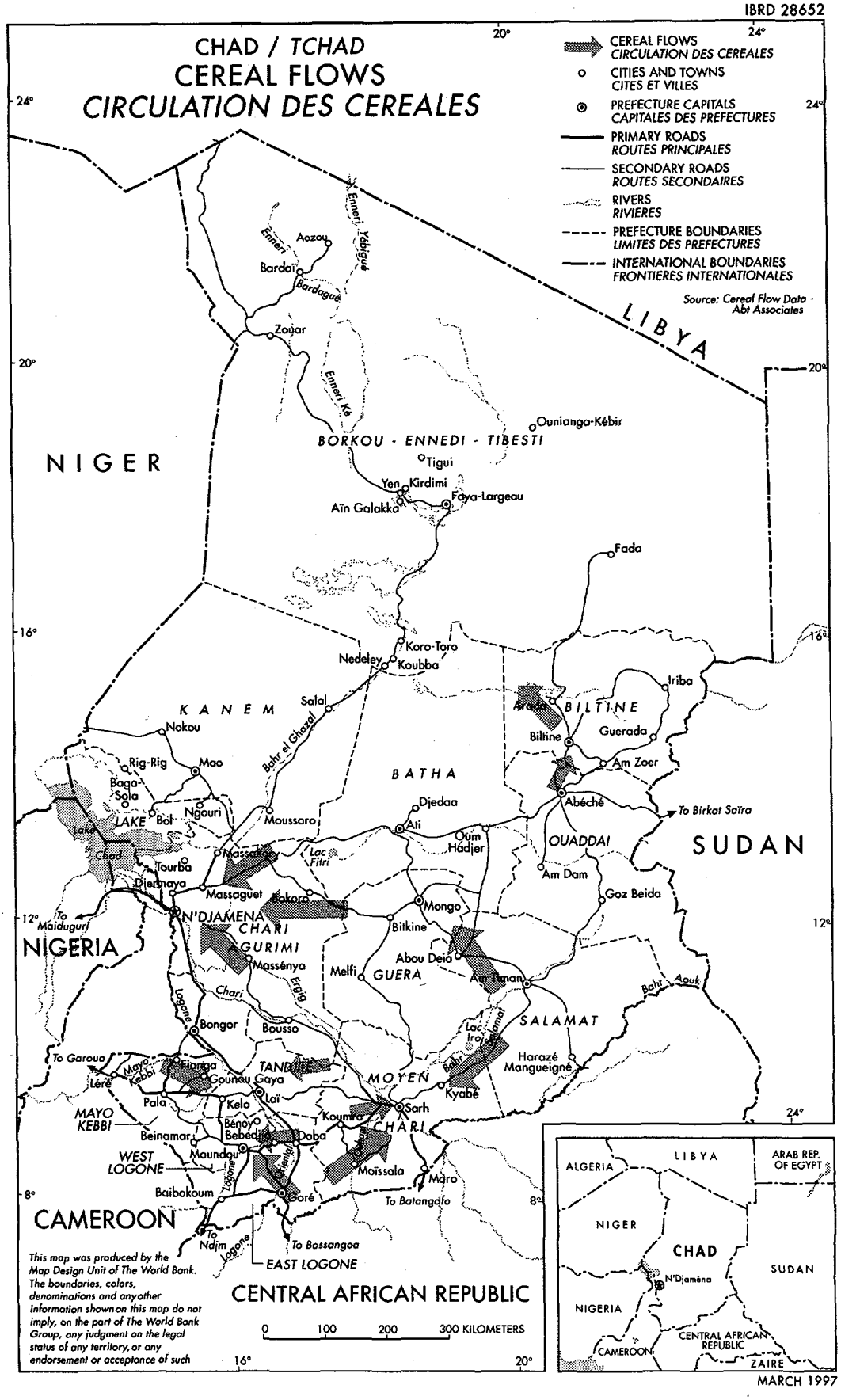
2.27 While there is widespread agreement on the benefit of roads projects, specific road construction and rehabilitation projects normally need to be justified by an economic cost-benefit analysis in which the Internal Rate of Return reaches a minimum threshold level --often in the 10 to 12 percent range. Project costs include the costs of rehabilitation and subsequent routine and periodic maintenance. The benefits include the expected reduction in vehicle operating costs for existing and induced traffic, and the expected increase in agricultural value-added production in the road's area of influence.

2.28 If one considers Chad's vast land surface and the very low average population density, it is not surprising that large part of Chad's road network has very little traffic, often in the range between 5 and 15 vehicles per day in average. As a result, if only few vehicles benefit from better roads, the overall economic benefits from reduced vehicle operating costs are also rather low. Also, agricultural productivity is generally low, mainly due to lack of farm capital, and climatic and soil conditions, so that agricultural benefits also limited. On the cost side, the absence of suitable building materials such as laterite and gravel in many areas, and the need to haul such materials over long distances, makes construction expensive. It is therefore not surprising that the traditional methods of economic cost-benefit analysis for roads fail to demonstrate acceptable Rates of Return for many road projects in Chad.

2.29 Nevertheless, roads are still being built in Chad, even in isolated areas, because there is widespread agreement that more and better roads are absolutely necessary to solve many of Chad's economic and social problems. Roads provide numerous benefits which are not easily captured by traditional cost-benefit analysis methods. It is difficult to measure the extent to which new or rehabilitated roads will stimulate agricultural trade over the medium term, as occurred, for instance, in Karal. Some types of roads would also provide access for most of the year to regions which are isolated by seasonal rains. Moreover, roads can be justified in terms of food security in a country, such as Chad, which suffers from recurrent droughts and famine. Roads may enhance food security by connecting the capital to famine regions and by connecting enclaved grain producing regions to markets (Map 2.1). Also, roads help to provide access to basic education and health services that are essential to reduce poverty.

2.30 There are valid reasons to believe that more and better roads, especially in low-density areas, are necessary to achieve the overarching objective of poverty reduction. Road projects should therefore by justified through a broad approach to estimating their benefits. For these reasons, Chad is now in the process of defining the most appropriate transport strategy for the next decade, by which it would implement the most cost-effective transport investment program for all modes to better and more effectively respond to the actual and foreseen transport demand.

Map 2.1


IBRD 28652
CHAD / TCHAD
CEREAL FLOWS
CIRCULATION DES CEREALES
CEREAL FLOWS
CIRCULATION DES CEREALES
CITIES AND TOWNS
CITES ET VILLES
PREFECTURE CAPITALS
CAPITALES DES PREFECTURES
PRIMARY ROADS
ROUTES PRINCIPALES
SECONDARY ROADS
ROUTES SECONDAIRES
RIVERS
RIVIERES
PREFECTURE BOUNDARIES
LIMITES DES PREFECTURES
INTERNATIONAL BOUNDARIES
FRONTIERES INTERNATIONALES
Source: Cereal Flow Data - Abt Associates
LIBYA
NIGER
NIGERIA
CAMEROON
CENTRAL AFRICAN REPUBLIC
SUDAN
BORKOU - ENNEDI - TIBESTI
KANEM
BATHA
BILTINE
OUADDAI
LAKE
CHARI
GURIMI
GUERA
SALAMAT
MOYEN
TANDJILE
MAYO KEBBI
WEST LOGONE
EAST LOGONE
N'DJAMENA
Aozou
Bardai
Zouar
Ounianga-Kébir
Tigui
Yen
Kirdimi
Faya-Largeau
Aïn Galakka
Fada
Koro-Toro
Nedeley
Koubba
Salal
Nokou
Rig-Rig
Mao
Baga-Sola
Bol
Ngouri
Moussoro
Djedaa
Ati
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Abéché
Iriba
Arada
Biltine
Guerada
Am Zoer
To Birkat Saïra
Am Dam
Goz Beida
Nassere
Tourba
Djermaya
Massaguet
Bokoro
Mongo
Bitkine
Abou Deia
Am Timan
Melfi
Massénya
Bongor
Bousso
Gounou Gaya
Laï
Sarh
Kyabé
Harazé Mangueigné
Pala
Kelo
Koumra
Bénoy
Bebedjia
Doba
Beinamar
Moundou
Baibokoum
Goré
Moïssala
Maro
To Batangafo
To Garoua
To Maiduguri
To Ndjm
To Bossangoa
Lake Chad
Lac Fitri
Lac Iro
Chari
Logone
Ergig
Bahr el Ghazal
Bahr Aouk
Ennedi
Ennedi Yébigué
Bardagué
Ennedi Ké
Tandjile
Mayo Kebbi
Lére
0 100 200 300 KILOMETERS
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ALGERIA
LIBYA
ARAB REP. OF EGYPT
NIGER
CHAD
SUDAN
N'Djaména
NIGERIA
CAMEROON
CENTRAL AFRICAN REPUBLIC
ZAIRE
MARCH 1997

D. WATER

2.31 As in other drought-stricken. Sahelian countries, water is a major constraint in Chad. It is needed for human and animal consumption and for irrigation to supplement the shortage and unreliability of rainfall.

2.32 In the Sahel, livestock movements often start when surface water (river, ponds, etc.) becomes shallow or dries up. A cattle herd of over 100 head cannot be sustained from water drawn manually by a family. Over the years, the *Office National de l'Hydraulique Pastorale et Villageoise* bored 266 wells, but most have become non-functional for lack of maintenance. Herders now tend to leave for the south much earlier, which sometimes damages unharvested crops, and return from deeper in the south at the start of the rainy season, trampling some seeds on their way back to the Sahel. At the same time, the high concentration of animals and people around the few wells in the Sahel contributes to water-born diseases.

2.33 There is little control of water for irrigation in Chad. Chadians take advantage of the receding waters around Lake Chad, in flood plains, and in low-lands to grow *bérbéré*, rice, and even vegetables, as in Karal. However, producers have little control over the receding water and they lack farm equipment to tap the shallow water table in the plains for irrigation. Observers note that irrigation pumps used on the Cameroonian side of the river compete for water, as well as supplying Chadian markets with Cameroonian-grown irrigated produce. The vast potential for irrigation, as estimated in the mid-1980's by ONDR and CILSS, includes 200,400 ha in the Sahel and 134,600 ha in the Soudan zone. There were then only 1,050 ha in the Sahel and 63,625 ha in the Soudan under irrigation development projects (SAID/ADO, 1985).

2.34 In the cotton zone, there is a general lack of water. Shortages are acute in north Kelo and north Moundou. Wells are becoming deeper as the groundwater table is drying up. To colonize new areas, farmers need access to water. Boring a well also attracts herders and may spur conflict (CIRAD, 1996).

E. CHARGES ON AGRICULTURAL PRODUCERS: OVERVIEW

2.35 The concept of a charge to farmers and herders used here is broad. Some of the charges are legal, others are extra-legal in that they are not authorized by law; and still others are illegal and do not accrue to the Government. Charges are imposed by the central and local governments, traditional chiefs, civil servants, various military personnel, and renegades as well. Together, these charges drive a wedge between the price retained by farmers and herders and the price paid by the final buyer. The result is to reduce final consumption of Chadian agricultural products and to discourage production and investment in agriculture and to harm farmers by lowering their incomes and consumption

2.36 Past studies documented the deleterious effects of export taxes, import taxes, and illegal payments at official as well as unofficial road blocks. Some progress has been made in eliminating or reducing the burden of official taxes and in raising awareness about the undesirability of illegal taxes and barriers. It has sometimes proved difficult to enforce tax laws

and prevent official and unofficial abuses because of limited public access to legal recourse. Excellent advances were made in reducing and eliminating some of the most onerous taxes on agricultural imports and exports. However, these measures often remain unenforced and often are unknown by the general public.

F. OFFICIAL TAXES ON THE AGRICULTURAL SECTOR

2.37 Several studies show the negative impact on agricultural production of official taxes on agriculture before 1994. Taxes on some agricultural inputs reached 75 percent (Leroy, 1994). Concerted efforts of Chadian business and donors community during 1993-1995 led to lighter official taxes on agriculture. The main sets of official taxes and fees on agriculture are:

- UDEAC tariffs on imports of agricultural inputs such as fertilizers and tools;
- the Statistical Fee (known now as the *Redevance Statistique*);
- the Complimentary Tax (*Taxe Complémentaire*) for agricultural equipment and diesel vehicles,
- the Rural Investment Fund Tax (*Fonds d'Investissement Rural*, FIR); and
- the Research Tax (*Taxe de Recherche)*, etc.

2.38 Discussion of taxes during 1993-1995 focused on the negative effect of heavy export taxes and inconsistent imposition of the taxes on exports from Chad. Export taxes on raw agricultural produce then varied from 5 percent to 20 percent. Another problem was the inconsistent base to which tax rates were applied: in one example, the official tax rate on sacks of exported peanuts used a per-sack value of CFAF 30,000 in Sarh, compared to CFAF 10,000 for sacks leaving through Moundou. The actual market price per sack in the market at the time was between CFAF 4,000 and 6,500. The negative effects of these taxes on income and on GNP is demonstrated in Leroy (1994) and Gianni (1994). On the advice of the Chadian business community, donors, and government officials, the *Loi des Finances 1995* completely eliminated export taxes on all crops. The only exceptions were a CFAF 5 fee per sack for the Gum Arabic Fund and the maintenance of the FIR and the *Redevance Statistique* taxes. Export taxes on livestock were greatly reduced in 1994 and the *Caisse Autonome d'Amortissement* Tax (CAA) was entirely suppressed for livestock. Customs no longer levies export taxes on gum arabic, as was verified with exporters and officials.

2.39 The *Union Douanière et Economique de l'Afrique Centrale* (UDEAC) consists of 6 member nations including Chad and strives to develop a uniform set of customs and duties regulations for use by all member nations. The code of tariffs was established formally in 1991 and is the subject of on-going negotiations. In 1993-1995, the Chadian delegation to UDEAC lobbied successfully for several changes that would reduce taxation of Chad's agricultural input imports. However many of these tariff schedule reductions cannot be unilaterally decided by Chad but must be approved by the UDEAC member countries. Several of the tariffs are being reduced or eliminated gradually: for example, the Preferential Tariff (*Tarif Préferentiel Généralisé or TPG*) is scheduled to be eliminated in several years. The *Taxe sur le Chiffre d'Affaires* (TCA) is being restructured in different way; it was initially intended to be levied on major companies only, although the process by which a company is determined to be subject to this tax is unclear (Table 2.2).

Table 2.2 Taxes and Tariffs Affecting Agriculture

Tax or Tariff Name	Pre-1993 Rate	1995 Rate[1]	1996 Rate[2]	Fertilizer and Agricultural implements
Tarif Extérieur Commun (TEC) This tariff was created in 1994-95, comprising a number of separate tariffs, among them the:		Category I: 5% Category II: 10% Category III: 20% Category IV: 30%	Category I: 5% Category II: 10% Category III: 20% Category IV: 30%	The TEC (still noted as the DD in the Code Tariffaire) on all fertilizers is Category I: 5%.
(1) *Droit du Douane* (DD), (2) *Droit d'Entrée* (DE)	30% 40%		(No change relative to 1995)	Most animal traction implements are in TEC Category II (DD 10%), with a TCA of 0% (exonerated). Hand tools are inconsistently written in the tariff schedule as TEC Category I (DD 5%), but show a percentage of 20%, which corresponds with Category III.
	[note: 1993 rate] Category I: 5% Category II: 15% Category III: 35% Category IV: 70%			
Tarif Préférentiel Généralisé (TPG) This reduced rate tariff applies to UDEAC-origin goods and products only. It is calculated as a percentage of the TEC, which it replaces.	40% to 50% of the above TEC.	20% of the above TEC (*Droits de Douane*)	10% of the above TEC (*Droits de Douane*)	Applied as above, depending on the TEC Category of goods.
Taxe sur le Chiffre d'Affaires (TCA) This tax now has two ranges plus a category for exonerated goods. The TCA is added to the DD or TEC. The following two taxes were replaced by the TCA in 1995: (1) *Taxe sur le Chiffre d'Affaire à l'Importation* (TCAI): (2) *Impot sur le Chiffre d'Affaire Intérieur* (ICAI)	10% Various rates	*Taux Normal* (TN): 15% *Taux Réduit* (TR): 5% (Applied to c.i.f. +DD. The TCA is then added to the DD)	*Taux Normal* (TN): 15% *Taux Réduit* (TR): 6% (Applied to c.i.f. +DD. The TCA is then added to the DD)	Fertilizers: some are completely exonerated from the TCA; a number are subjected to the TN. The TCA is zero (exonerated) on urea and binary fertilizer with 15% on most others, particularly NPK. Agricultural Tools: Most are subject to the TN.
Redevance Statistique (added to DD and TCA)	1%	1%	2%	Applied to all agricultural exports.

Sources: Republique du Tchad (Janvier 1995): Tarif des Douanes Applicables au Tchad ; [1] *Loi des Finances 1995*; [2] *Loi des Finances 1996*; and interviews with officials at the Ministry of Finance. Note: For 1997, only one TCA rate of 15% will apply to all goods that are subjected to the TCA, according to two officials at the *Direction des Impots* interviewed January 19, 1997.

2.40 The main tax reduction occurred over 1993-1995 period when the number of tariff rates (known as the *Tarif Extérieur Commun* or TEC) imposed on products from outside of the UDEAC was reduced to four rates with the Customs Tax and Entry Tax rolled into one. From a high of 30 percent for such imports as pesticides and fertilizers, as well as agricultural tools, these items were negotiated down to 5 percent for fertilizers and 10 percent for tools. Certain kinds of transport vehicles were moved from category IV, where luxury or tourist vehicles are now taxed at 30 percent, to Category II which is taxed at 10 percent.

2.41 The Preferential Tariff (*Tarif Préferentiel Généralisé or TPG*) is a special tariff rate on inputs from within the UDEAC. The tax rate is zero for raw animal, vegetable and mineral products, and 10 percent of the TEC rate levied on other finished goods from within UDEAC. During the same period, the sales tax (*Taxe sur le chiffre d'affaires, TCA*) was reduced to a three-rate tax with a standard rate (*Taux Normal, TN)* on regular goods, a reduced rate for primary necessity goods (*Taux réduit, TR*), and a zero rate on raw agricultural products and some fertilizers and agricultural tools. Based on interviews with two senior Customs officials, it appears that the *Loi des Finances 1997* will eliminate the TR and apply only the TN at 15 percent, which would constitute an overall increase in the sales tax.

2.42 One of the key problems is that implementation of tax policy generally lags behind changes in policy. Two hundred copies of the revised *Code Tariffaire* were distributed in 1995 to customs agents as well as private sector organizations such as the Chamber of Commerce, various trade associations, and some exporters. But no known analyses have been conducted to determine the extent to which the revised tariff structure is being accurately applied.

G. COTTONCHAD'S PURCHASE PRICE OF SEED-COTTON AS A CHARGE ON PRODUCERS

2.43 On of the heavy charges on farmers is the transfer that results from the operation of Cottonchad. This is a majority state-owned company that also has a private share-holder, the CFDT, that manages much of the company under contract. Cottonchad is a monopsony that has the exclusive legal right to buy (unprocessed) Chadian seed-cotton from producers, mostly poor small-farmers. Cottonchad buys at a price fixed in advance of the growing season, offering in effect a price guarantee, and also provides fertilizer and pesticides on credit. The company is a vertically integrated monopsony that gins and then markets the (processed) cotton lint through its own network.

2.44 Cottonchad believes that its legal monopsony and vertical integration allow it to get the best CIF price. The company may carry excessive costs in management, procurement, and marketing, and is a major borrower from the banking system. Interest payments to the banks may also support excessive costs there. These issues will be assessed in separate sector work. The issue of direct concern for the Poverty Assessment is the extent to which Cottonchad transfers resources from the small producers to its owners and managers by paying a price for seed-cotton that is below the competitive market price.

2.45 There is unfortunately no reference price for the competitive price of seed-cotton in southern Chad. It is difficult to estimate the competitive price because detailed data on cost of

production are not available. However a comparison of fluctuations in the price of seed-cotton and cotton lint suggests that Cottonchad has not passed most of the benefit of the devaluation of the CFAF on to farmers (Table 2.3). From the 1992/93 to the 1995/96 season, the price paid to farmers rose by 22.3 percent, but the FOB sale price at Douala more than doubled, rising by 52.5 percent. 2.48 Cottonchad reports prices for second and third quality seed cotton, yet for three years running it has refused to buy anything but the first grade. The official monopsony of Cottonchad may dissuade potential buyers because there is little demand for the second grade, producers sometimes discard it. Some second grade cotton however is sold to Nigerian or other foreign traders. The ONDR estimates that the second grade amounts to about 3 percent of the 200,000 tons of first grade sold by farmers. At CFAF 60 per kg for the official price of the second grade, producers would lose some CFAF 360 million. This would be over half the marketing bonus (*ristourne*) paid to Village Associations (VA) for handling cotton at the *centres d'achat.*

Table 2.3
Producer Prices, Export Prices and Transport Costs of Cotton
(in CFAF per kg)

Items	92/93	93/94	94/95	95/96	1992/93 - 1995/96 Avg. annual % change
Average Cottonchad producer price	77	89	119.8	139.9	22.3%
FOB price of lint in Douala	302	706	940	852	52.5%
Transport to Douala	54	7	101	107	26.6%

Source: Cottonchad cited by Yacoub, personal communication.

2.46 The mission heard reports that village associations sometimes pay about CFAF 20,000 to have Cottonchad's containers delivered to pick up cotton. Producers were sometimes asked for tea and other gifts when requesting help from the extension service (CIRAD, 1996). As a response to producers' complaints about cotton grading once performed by Cottonchad agents, government mandated agents *assermentés*, or certified agents perform the task. Apparently some grading agents *assermentés* exact illegal payments from farmers to accept their cotton as first grade.

Table 2.4
Indices of Cotton Operating Margin and Cost of a Plow

Indices	1980	1983	1990	1995
Operating margin /ha (CFAF 21,000 in 1980)	100	243	266	309
Cost of a plow (CFAF 8,000 in 1980)	100	100	513	847

Source: G. Raymond cited by CIRAD, 1996

2.47 For three years running, there have been reports from farmers that Cottonchad has supplied farmers with inputs without telling them the cost until late into the growing season. In some cases, Cottonchad supplied farmers with inputs in December 1995, but only told them the price of the inputs in June, 1996. Some farmers also report that Cottonchad forces them to buy batteries for use in spraying of pesticides that cost more than in local markets. Farmers interviewed said they were given no information as to why input prices have risen.

2.48 Other issues in pricing of inputs are the limited access to farm equipment and high charges by the extension service for their acquisition. Increasingly, animal traction equipment is moving out of cotton farmers' reach. The ONDR calculates that whereas farm operating margins, after payment for inputs, went up three-fold from 1980 to 1995, the cost of a plow multiplied by more than eight (Table 2.4). In 1996, a plow costing CFAF 67,000 was worth 479 kg of first grade seed cotton and a cart of CFAF 266,000 was worth 1,900 kg of first grade seed cotton.

2.49 Furthermore, users of imported urea bear a lower tax burden than users of the imported compound NPK/SB (Sulphur and Boron) --which is more widely used. While the import tax (*droit de douane*) was 5 percent for both chemicals, urea was exempt from the TCA, while imported NPK/SB bore the TCA *Taux Normal* rate of 15 percent. Changes made for 1997, and discussed above, would imply an increase in the overall tax rate on imported fertilizers.

2.50 Despite below competitive market producer prices and high inputs prices, the cultivation of cotton appears profitable for small farmers. Cottonchad has increased producer prices enough to ensure profitability, perhaps in reaction to previous poor harvests. When the price of cotton was kept low prior to the devaluation and producers lost money, and many shifted towards peanut production, often using Cottonchad-provided fertilizer and inputs. Indeed, a large surge in peanut production occurred in the year following the six to eight-month late payment for the cotton made by Cottonchad during 1992-1993.

2.51 Costs of production in cotton calculated by PRISAS researchers from survey data show a positive net margin in recent years (Annex A Table 20). PRISAS's estimates are synthetic as they are concerned with a model farmer using the recommended package of inputs rather than the actual farmer who may not, as his demand for inputs is only partially met by Cottonchad. Because of this, the average farmer is likely to spread his inputs, including pesticides, on a larger area resulting in lower yields, yet higher costs of soil preparation.

H. LOCAL LEGAL AND EXTRA-LEGAL TAXES ON AGRICULTURAL PRODUCERS

2.52 Despite the central government's efforts, local governments still continue to levy taxes on producers and traders of agricultural products, though the magnitude is reportedly less than in the past. For example, a taxation issue that received considerable attention in 1992 was the tax generally charged by prefecture-level officials, for movement of cereals and sometimes other produce from one prefecture or even one market to another. Generally this was in the neighborhood of CFAF 100 to 300 per sack. In 1993, however, the Minister of the Interior announced an official *note circulaire* that instructed all prefects and territorial administrative officers to stop any such collection of taxes on agricultural products moving from one region to another. In spite of repeated instructions in 1993 and again in 1994 and public announcements via radio and press that this illegal procedure would not be tolerated, such charges continue to be imposed.

2.53 Furthermore, local traditional and civil authorities also collect informally imposed 'taxes' that have never been officially approved nor disapproved, yet are being used now to complement salaries, fill social service needs, assist in funding campaign and election activities, or on occasion,

for personal uses. The population appears to accept taxation by traditional authorities (*chef de canton* or Sultan), but to a point. One reason for the presence of local taxes is that the central government provides meager salaries to local heads of government that are sometimes as low as CFAF 20,000 per month, mostly CFAF 40,000 to 60,000 and rarely CFAF 100,000. So, these local authorities generally resort to taxation of citizens as compensation. The Sultan (traditional political figure), the *chef de terre* (spiritual traditional leader), and sometimes the Prefect are reported to levy various taxes. For example, the sultan of Dourbali levies a fee of CFAF 6,500 on each gum Arabic plantation. The case of Karal illustrates the full burden of taxes imposed by local governments and officials (Box 2.2). Many Chadian producers interviewed in Karal, view the *chef de canton's* or sultan's taxation as abusive. They argue that the Muslim *zhaka* is the individual duty to give for charitable purposes and not a tax to be paid to the Sultan. Some Karal farmers report that the Prefect supported local taxation that the Ministry of Interior had declared illegal.

2.54 Forestry agents are known to levy an 'environment' tax for the degradation of the environment stemming from the poles used by animal owners to build fences, but the agents do always provide receipts. For example, CIRAD (1996) reports that farmers in the south complain that once an agent taxes an animal owner, other agents will show up to levy similar taxes. They must pay CFAF 2,000 to 2,500 for a 10-head herd and CFAF 15,000 CFAF for a 100-head herd.

2.55 Also gum Arabic traders mention that the *Direction des Eaux-et-Forêts* has issued exploitation permits for gum Arabic. The intent of the Forestry department was to compel traders

Box 2.2
Local Extra-Legal Taxation at Karal

Each cereal producer is required to give 10 percent of his production as Zhaka to the sultan. At sowing, a cereal producer pays CFAF 500 per plot to the *Chef de terre*. At Tabaski, which occurs 40 days after the end of Ramadan, he gives CFAF 500 per plot to the Sultan. When selling produce for shipment to N'Djaména, the producer must pay CFAF 100 per bag of cereal, CFAF 100 francs per box of tomato, CFAF 100 per bag of gumbo, CFAF 250 per bag of 250 kg of potato, and CFAF 100 per bundle of sugarcane. Only cowpeas are not taxed at the market, but then the forestry and custom agents each collect CFAF 300 per bag. (The shipment fee applies only when goods are sold for shipment to N'Djaména). Even boat owners that help producers harvest sugarcane when water has not receded must pay CFAF 500 per trip.

To illustrate, the table below shows the local taxes paid annually by an average family with one plot of corn producing 30 bags and selling 10 bags at CFAF 1,000 per bag; selling 320 bags of potatoes, and 125 bundles of sugarcane. Total local taxes would then exceed the price of a wheel barrow (CFAF 35,000):

Crops	Sowing	Tabaski	Zhaka	Shipment	Total
	CFAF				
Corn	500	500	3,000	1,000	5,000
Sweet Potato	----	----	------	32,000	32,000
Sugar Cane	----	----	------	12,000	12,000
Total	500	500	3,000	45,000	49,000

Source: Abt Associates.

of gum Arabic to let Forestry field agents register the quantities of gum. This seems to have strengthened the hand of Forestry agents asking for illegal payment. Some wholesalers in N'Djaména took advantage of the situation to sell photocopies of the free permit to unsuspecting collectors of gum Arabic.

2.56 Other legal taxes or service fees that have remained include sanitary fees: a *certificat zoosanitaire* (CFAF 2,500 per herd) and an earmark tax of CFAF 2,100 per cattle (small ruminants are not subject to earmark fee). For cereals and other crops, extra-legal or illegal taxes are still being levied against livestock exporters. For example, the transaction tax levied at market places by both local official representatives and *Chef de canton* remains. The *Chef de canton* may also impose a guarantor in each market: cattle owners pay CFAF 1,000 per head of cattle and CFAF 500 per small ruminant. This guarantor is suppose to guarantee ownership of the animal being sold. There are also market intermediaries, who though they render valuable services have managed to impose their services at the market place. The intermediary (the lodger) houses the seller and protect his animals in the village and guarantees the legitimacy of the transaction (Bonfiglioli, 1993). In addition, forestry agents levy "environment taxes" against herders that park animals inside fences. Occasional conflict between herders and crop growers adds another layer of expenses, when herders pay officials for protection or damages.

2.57 Livestock merchants exporting to Nigeria face considerable market risk and uncertainty. Merchants selling animals in Nigeria must go through a local broker (or lodger). The waiting period necessary for the broker to find large enough buyers may take several months. More importantly, Nigerians pay Chadians in widely-fluctuating Naira currency, which Chadians cannot exchange in CFAF or other hard currency either country. Unless Chadian exporters go to the black market, they are forced to buy Nigerian goods for resale in Chad. Some liken this pattern of transaction to barter trade, as they observe Chadian traders going to Nigeria with animals and coming back with Nigerian goods and no money (Abdel Salam et al. 1994). Other major concerns of livestock exporters are charges on the roads to Nigeria, Cameroon, and Central African Republic.

I. Illegal Charges on Agricultural Producers.

2.58 Several studies have focused on the roll of illegal road charges, or bribes, on raising transport costs within Chad. Abdlewahid (1994) estimates that illegal charges at road barriers increased transport charges by about 10 percent. Kent (1993) argues that these illegal charges at road barriers were mostly born by producers rather than consumers. Traders and transporters interviewed during the rapid appraisal confirmed that illegal charges on transporters are incorporated in the transport charges, or '*frais de route.*'

2.59 Several private transporters interviewed at Dourbali and Moundou noted that the reported *frais de route* are not entirely meant for illegal payments. Their original purpose was to cover legitimate business expenses of the driver and apprentices. But those questioned reported that, as a rule of thumb, half of the *frais de route* goes for legitimate business expenses, and half for payments at borders or at roadblocks. One study estimates that *frais de route* represent 13 percent and taxes 12 percent for trucks above 20 tons, and 3 percent and 19 percent respectively for 6 ton trucks (BCEOM, 1995).

2.60 In recent years, the Chadian government and donors have joined forces in an effort to stamp out illegal payments and harassment of passengers and transporters at internal road barriers. A *"Conférence Nationale Souveraine"* was held on January 15, 1993 during which speakers denounced illegal charges exacted by police and paramilitary forces at official and unofficial barriers. Following the conference, the President issued a decree signed June 8, 1993, banning road barriers and illegal searches of passengers and transporters throughout the territory. From October 1994 to March 1995, the Government and donors sponsored seminars to raise public awareness about the deleterious effects of illegal payments and export taxes; for example, those levied against cereals, gum Arabic and sesame. In April and May, 1995, the Minister of Defense and the Minister of Internal Affairs jointly toured the country for the express purpose of dismantling road barriers. The President, at his recent inauguration in September 1996, spoke strongly against road barriers and illegal payments, and ordered them destroyed on his way to Moundou.

2.61 There is now an increased awareness of illegal payments by producers, traders, and transporters. Transporters acknowledge that the situation has markedly improved, for example as was assessed first hand between N'Djaména to Dourbali, between N'Djaména to Moundou, and N'Djaména to Karal. Also from N'Djaména to Dourbali, it is no longer necessary to have an escort by regular soldiers. Transporters noted in December 1996, following the President's action, that because of the reduced number of road barriers, they pay about half of what they used to pay in bribes to pass barriers.

2.62 Illegal charges have two root causes that show no sign of disappearing: one is that low-paid paramilitary forces find in illegal payment a convenient means to supplement income, or provide their main income. The second is that the victims, transporters, often themselves initiate bribes to avoid paying heavier fines for such violations as lack of proper transport documents, unsafe vehicles, desire for quick release at rain barriers and smuggling. A private Chadian transporter interviewed in Moundou admits that there are hardly any private Chadian transporters that would pass a lawful inspection of their documents and vehicles. In part, however, transporters must resort to bribes because they lack the means to comply with all the heavy taxes imposed by Government. In part also, transporters lack financial resources to renew their fleet or maintain existing ones and comply with all safety regulations.

2.63 Another illegal charge is imposed by civil strife. For instance, rebels in the south have been reported to prevent farmers from growing cotton (CIRAD, 1996). Furthermore, rebels and renegades engage in banditry and pillaging of farmers' crops and assets: carts have been chopped into fire wood, cattle slaughtered, and granaries looted; large transport trucks have been held up at gun point and looted or burned. The consequent physical insecurity has affected producers' behavior. Producers sometimes prefer to sell off agricultural products as soon as possible: cash is easier to conceal than granaries and other signs of wealth. Crop producers also tend to restrict agricultural activities to the immediate village surroundings, which is better protected but less fertile, at the expense of far away fields, which are more fertile but insecure.

J. LAND TENURE AND PRODUCTIVITY

2.64 Lack of secure access to land is another way in with the rule of law and legal arrangements can constrain agriculture. Producers for instance are unlikely to develop long-lasting land improvement practices without secure land tenure. Tree tenure would motivate increased investment in gum Arabic production and forest management for fuel-wood production. Land tenure in Chad is a complex, often confusing combination of four different basic land tenure systems (Box 2.3).

2.65 The central government has not established a land tenure system that is satisfactory to all parties, although it attempted to design a rural code in 1990 and made another attempt in 1995 in relation to the Desertification Convention. The challenge for the Government is to find a system that will promote investment in agriculture while balancing the interests of farmers and herders.

2.66 Changing economic and ecological conditions are reshaping land tenure systems. In the cotton zone, commercial farming, increased population density, and low access to agricultural inputs are creating a class of landless producers who rent land and offer their labor for hire. Forty percent of the farmers cultivate 20 percent of the land, while the top 20 percent cultivate 40 percent of the land (ONDR, June 1992).

2.67 Strains are developing in the traditional land tenure system in the Soudan region. The secular village leader, more than the *chef de terre*, is increasingly called upon to mediate conflicts and allocate land. It is often unclear whether the civil or traditional authority is primary. Despite an emerging land rental market, no rural land is being offered for sale yet, or if

Box 2.3
Four Basic Land Tenure Systems in Chad

1. In several regions, the traditional system among sedentary farmers is that land belongs to the family (lineage) of the first individual who cleared the land, and thus recognizes collective rather than individual ownership rights. The spiritual leader, *Chef de terre*, rather than the political leader, Sultan or village chief, gives individuals user rights, which may be passed to their male descendants (a few ethnic groups allow inheritance through females). Rights are maintained by cultivating the land regularly and a fee is paid to the clan authority (Bonfiglioli, 1993). However, with more than 200 ethnic groups in Chad, there are many variations on this general system. In the non-sedentary group, pastoralists consider transhumance routes as free range.

2. In certain areas, tradition centralizes land ownership in the hands of the Sultan, including oases, access to rivers and water holes. The sultan of Ouaddai, for instance, has rights over the land and all river beds.

3. The colonial land tenure system introduced private individual ownership at the same time as it decreed state ownership over all so-called vacant land, including forests and fallow land.

4. The modern Chadian system is an uneasy combination of parts of the colonial system, and the various traditional and Islamic systems. For example, natural forests are considered state property and basic tree tenure is denied to users who have planted or protected trees on fallow land. At the same time, the modern state tendency in developing new systems of land tenure is to favor individual ownership through purchase (CIRAD, 1996).

offered for sale, proprietorship is not guaranteed through cadastral policies or formal surveys.

2.68 In the Sahel zone, conflicts have developed over control of wild plantations of gum Arabic, between migrating herders who have used gum Arabic from specific trees for generations for their own consumption and sale, and the indigenous people who have only recently learned of the commercial value of these trees. Often, the conflicts are among members of the same family who dispute ownership of the tree or the land upon which the tree is located; the number of fatalities relating to gum Arabic tree *(Acacia senegal)* disputes have increased markedly. Finally, both herders and farmers are encroaching on each other's traditional ground: as herders abandon drought-stricken areas in the north, they encroach on crop lands in the south. In turn, as population and insecurity increase, shifting cultivators encroach on traditional grazing areas and livestock corridors.

K. Technology and Extension as a Constraint to Agricultural Productivity

2.69 Given rights to land and rainfall, agricultural productivity depends on inputs such as fertilizer, pesticides, vaccines, and farm implements as well as on technical knowledge. The application of yield-improving technologies depends on their availability, that is on agricultural research, and on the ability of farmers to invest in equipment, labor, and material inputs needed to apply the technology.

2.70 In the Sahel region in 1993, only 0.3 percent of farmers had any animal traction equipment. In contrast, all across the West African Sahel, donkey traction is now a common fixture of rural life, particularly in farm transport and also for seeding. There is little use of fertilizer and pesticides except on cotton and rice. Since cotton must be treated against pests, farmers must dilute the chemicals to cover the entire area planted. This could breed more resistant pests and ultimately reduce cotton production in the Soudan. The ONDR estimates that in 1996, after about 70 years of cotton production in the south, close to a quarter of cotton farmers still use no inputs to improve the soil.

2.71 Chadian farmers make little use of alternative fertility enhancing practices such as manure, compost, and green manure even in the fields surrounding the compounds, which is common practice in West Africa. In the Soudan zone, Kachiang and Fajveau (1995) estimate the fertility of 175,000 ha or about 1.5 of the area cultivated can be significantly improved with green manure. However, alternative fertility enhancing practices can be demonstrated through extension service to farmers.

2.72 With regard to animal manure, the integration of agriculture and livestock management in Chad is constrained because it appears to be limited to the use of draft oxen. The reasons for the limited use of organic fertilizer are that few farmers have been exposed to the use of manure, especially in the Soudan. Given the lack of extension services, farmers fear that the use of manure will spread striga (a weed) in their fields. Moreover, often farmers do not have enough animals to produce manure. In many cases, there are no contracts between farmers and herders as is observed in West Africa. In such a contract, a farmer allows herders' cattle to feed on millet and sorghum stalks and thus produce manure to fertilize their fields. Also, the use of fertilizer

requires a cart to transport it to the field, and few can afford carts, and hard work to handle the compost.

2.73 Since the 1996/97 season, the Agricultural and Pastoral Services Project (*PSAP*) has addressed some of these needs by promoting the integration of farming and livestock, especially in the Soudan zone. The project promotes agricultural extension in the areas of animal feed, the production and use of organic materials in cereals farming and especially in cotton. The project also launched operations to provide credit for agricultural equipment such as carts necessary for the transport of animal manure and of harvests. Some innovative methods for management of natural resources, such as pasture, were launched in the National Livestock Project (PNE) and are being expanded as part of the PSAP (Box 2.4).

Box 2.4
Pilot Project for the Management of Natural Resources

The national livestock project (PNE) launched a pilot project for management of the pastoral environment in July 1994 in the villages of Fadje and Djikine, which are about 100 km north of N'Djaména. The objective of the pilot is to put in place and improve the participative and holistic approach to rational management of natural resources by the users.

To assure cooperation, meetings were held between villagers and external users such as neighboring villages and livestock traders before the start of activities. The pilot then organized and trained the agro-pastoralists from each village in two groups, focusing on training of the two assistants for the environment in each group. The pilot also co-financed the construction of two wells for livestock. It made a tripartite agreement with the local authorities, the using communities (including nomads) and the Ministry of Livestock. This led to the establishment and execution of a plan for action on social and natural issues.

The results pleased the villagers because pasture land was regenerated in quantity and quality and because of the socio-economic impact. These were the reduction of the period of transhumance from 5 to 2 months, the construction of buildings in more stable material (earth bricks and metal roofs), the diversification of productive activities (for example, the purchase and sale of livestock by men and of milk by women), and the resolution of conflicts between sedentary and seasonally migrating agro-pastoralists. Because of these results the pilot activities are now being extended as part of the PSAP.

2.74 Historically, Chad had limited capacity for agricultural research, and that limited capacity was largely destroyed by civil strife in the late 1970's and early 1980's. The only major research station in Chad, at Bebedjia, was funded by the former *Institut de Recherche sur le Coton et le Textile* (IRCT). Only recently, since 1988, has the station expanded its scope from its focus on cotton to include research on food crops. With minimal research and extension on food crops, most are traditional low yielding varieties. Recessional sorghum varieties are not a major focus of international research either. As a result, yields are low in both the Sahel and Soudan zones compared to similar parts of Sub-Saharan Africa, even though yields in most of these countries are low by world standards.

L. Other Potential Constraints to Agriculture

2.75 This chapter has argued that the most powerful constraints to agricultural incomes, judging from the limited available evidence, are the road system and the cumulative burden of the various charges on farms: legal, extra-legal, and illegal. There are several other potential constraints which may prove important, but which are poorly understood.

2.76 The most apparent of these has been the rule of law. This theme has reappeared in discussions of rights to land, taxation of agricultural producers by local officials and traditional leaders, and bribes charged to transporters. The weakness of the banking and payments system may be related, since it is difficult to safely transport cash, and also appears related to enclavement resulting from the lack of roads and telecommunication. The difficulty of making payments increases the costs of trade in agricultural goods and inputs, and the weak banking system means that there is nearly no private credit for agriculture.

2.77 The underlying constraint to agricultural incomes resulting from the status of women, who provide a majority of labor in agriculture, and of education, and in particular the education of girls, will be assessed in the chapters that follow.

3. CONSTRAINTS TO WOMEN'S CONTRIBUTION TO AGRICULTURE

A. OVERVIEW OF THE CONSTRAINTS TO WOMEN IN AGRICULTURE

3.1 In rural Chad constraints on women reduce household incomes from agricultural production and marketing. The total loss of incomes arising from the constraints may be cumulatively large, but the relative importance of each constraint is poorly understood because of a lack of data and of research, but some basic observations can be made.

3.2 Because of their traditional primary role as mother and spouse, women are usually confined to the private sphere and to home-based economic activities. In many local traditions, there are women's crops as well as women's tasks. These constraints on women's activities mean that women may not make the most productive use of their time, given their talents and local opportunities. Moreover, the traditional allocation of activities by gender results in a constraint on time. Women work longer hours than men and have less control of their time and this may crowd out time spent in agriculture and lowers women's productivity.

3.3 Limits on women's right to inherit land and to consume the product of the land may further constrain women's productivity. This may discourage women's investment in working capital, land improvement, agricultural equipment, and livestock. It may also lead to inefficient decisions about which land to work, and what agricultural methods to use. Another constraint is limited access to credit, which limits investment, and the lack of access to extension.

3.4 It is difficult to judge whether these are more significant than the indirect constraints of relatively poor women's health and education. Women's general capacity for productive labor may be constrained by a combination of recurrent intestinal disease and malaria, poor nutrition, tightly spaced childbirths, and female genital mutilation. Unfortunately, little is known however about how women's general health is linked to their productivity in agriculture. The female disadvantage in education, as measured by school enrollment and literacy rates, more clearly constrains women's productivity. Several econometric studies document the link between female education and productivity in agriculture (Quisumbing, 1994, and Moock and Addour 1993).

3.5 These constraints may have been worsened by the socio-political events over the past 15 to 18 years and the consequent loss of men to war and migration. As a result many women have assumed increased responsibility to provide for their families. At the same time, several writers observe that attitudes towards women seem to have evolved, as men are becoming increasingly aware of the importance of women's contributions to household income. Gender roles in agriculture are evolving in parallel ways in other parts of Africa (Box 3.1).

Box 3.1
Traditional Farming Patterns in Sub-Saharan Africa Are Changing

The gender-specific nature of farming is disappearing because: (1) traditional agriculture cannot feed the rapidly growing population; and because of (b) perceived higher returns and employment opportunities in urban areas, mines and plantations. Therefore, more men are now turning to off-farm work and their wives, remaining on the farms, are becoming the de facto farm managers.

This is breaking down the gender division of labor and consequently women are undertaking tasks previously done by men. In Kenya, for example, the distribution of labor for maize, by type of activity, shows that 87% of women work regularly in planting, weeding, and harvesting compared to 54% of men. In Burkina Faso, for example, these changes in farming labor are also resulting in changes in the gender distinctions of crops. Women in Burkina Faso are devoting more time to their individual plots and planting a larger proportion of their plots with basic foodstuffs such as millet and sorghum at the expense of crops traditionally planted by women, such as peanuts. These changes are having a significant impact on the agricultural productivity of the region.

Source: Saito, Katrine., 1994.

B. Women's Crops and Tasks

3.6 There has not been, however, a fundamental change in traditional ways of life in rural areas in Chad. In the Sahel zone, women traditionally work in the family millet, sorghum, or wheat fields. They also tend their own fields of peanuts, sesame, eggplant, and manioc and of okra, tomatoes, cucumbers, sorrel, onions, garlic, and peppers, while others collect gum arabic. Herder women tend small animals (chicken, goats, sheep), dry and smoke meat (*charmoute*), milk cows and make butter, cheese and yogurt to sell, along with milk, in markets. Women in the Ouaddai and Guera also weave rugs and blankets for sale and fishermen's wives around Lake Chad, and the along Chari and Logone rivers, dry and smoke fish for sale.

3.7 In the Soudan women work on family sorghum or cotton plots, on rice in the southwest, and sugar cane around Sarh. They also cultivate collective gardens of peanuts, beans, manioc, and condiments, raise small stock, and make traditional beer (*bili bili*). Women constitute one-third of itinerant merchants who buy cereals in weekly rural markets and sell them in urban trading areas. Women peanut farmers in the south organize truckloads to destinations like Brazzaville. In the Sahara, women cultivate dates, olives, figs, wheat and vegetables and tend small animals. Some sell surplus garden produce, dates from their own trees, eggs and manufactured imports, such as macaroni and canned goods.

3.8 The limited data that are available on the income of rural women demonstrates the importance of women's crops and of marketing in supplementing family income and nutrition. The Chad Child Survival Baseline Survey in the Moyen-Chari in the Soudan zone focused on mothers age 45 and under. Among the women interviewed, 43 percent had their own grain fields and 10 percent had their own cash crop fields, typically cotton, peanuts, vodanzeia, or sesame. Traditional beer production and small commerce were the main sources of their income that was spent on household expenses. The survey found that 79 percent of rural women were only

earning just enough or slightly more than the minimum need for cash to feed their families, defined as CFAF 5,000 per month (DEVRES, Inc., 1992). Women also use cash earnings to cover civil and social obligations such as assistance to parents, friends, religious contributions, and funerals.

3.9 A study of women in agricultural marketing in rural areas around Abéché, Moundou and Sarh found that 70 percent of the sample were married, but nevertheless 32 percent said they were the head-of-household and 35 percent were the sole source of family income (Brown 1994). In Abéché, which was particularly touched by civil conflict and migration, 55 percent of the women sampled were the head-of-household and 77 percent were the family's sole source of income. The rural women's source of start-up capital was likely to be small, and from a female family member or from sale of jewelry. About 61 percent of rural women and 47 percent of urban women interviewed began with less than CFAF 5,000 in capital. Overall, 47 percent of rural market women earned less than CFAF 2,000 per day and 25 percent between CFAF 2,000 and 5,000. However, there were wide variations: 71 percent of Abéché respondents earned less than CFAF 2,000 per day, 52 percent in Sarh, and 18 percent in Moundou.

C. TIME CONSTRAINTS

3.10 The time constraint arises because rural women are traditionally responsible for household chores and maintenance, the preparation of food, transport of fuel wood and water, for much farming, the education of children, and family health care. The only available survey of time worked by rural women was conducted by the *Bureau interministériel d'Etudes* (BIEP, 1989). Unfortunately, the survey gathered information about ranges of time worked so that it is not possible to estimate the uses of an average workday.

3.11 In the BIEP survey, more that more than 80 percent of women in the Chari-Baguirmi and more than 63 percent in 5 other prefectures spent between 2 to 8 hours per day working in the cereal fields, clearing and tilling land, seeding and weeding. Harvesting was even more time consuming: more than 83 percent of women in Chari-Baguirmi and more than 97 percent in the south spent 2 to 8 or more hours per day threshing, winnowing and transporting cereals. During both planting and harvesting periods, about half of those interviewed walked 5 to 25 kms per day to and from their fields. Nearly three-quarters of the herder women surveyed spent 2 to 8 or more hours per day seeking grazing land and more than 64 percent spent 0.5 to 2 hours per day finding water and veterinary treatment for small stock and milking cows.

3.12 Moreover, the study found that a majority of women surveyed spent 2 to 8 hours per day searching for fuel wood and walked 5 to 25 kilometers to find wood. Women walk greater distances to find firewood as deserts advance in the Sahelian zone and deforestation spreads in the Soudan. Furthermore, women walk longer distances to fetch water as water supplies become scarce. Three-quarters of the women surveyed spent 0.5 to 2 hours per day transporting water and more than 90 percent walked 1 to 5 kms per day to fetch it. Moreover, water from traditional or improved wells must be laboriously hauled up by rope.

3.13 Marketing, food preparation and child care are also time-consuming for women. The majority of women interviewed in the BIEP time study spent 2 to 8 hours per day walking 5 to 25 kms to and from markets to sell or buy food and household products. More than 68 percent of respondents spent 2 to 8 hours per day preparing food. Child care in the home accounted for less than 2 hours per day. A majority of the respondents who took their child (or children) for treatment at a health center spent 2 to 8 hours, with more than 40 percent walking 1 to 5 kms.

3.14 Poor transport contributes to the time constraint. Most women transport water, fuel wood and other goods on their head or shoulders and walk everywhere. In the rainy season, already poor roads are frequently washed out, curtailing access to markets and public services. Moreover, transport in rural areas is scarce and costly, and commercial trucks are usually overloaded with goods and passengers.

3.15 Several technical improvements would help ease the time constraint on women and also enhance their productivity. One example would be a shift from traditional means of threshing and hulling grain. Women could benefit from time-saving capital such as wells, animal-drawn plows and wagons, push-carts, seeders, manual water pumps, improved earth ovens, millet threshers, motorized rice and peanut hullers and grain mills, and from training in maintenance.

D. INHERITANCE AND LAND OWNERSHIP

3.16 National law is progressive and respects the rights of women. For example, article 161 of the Constitution prohibits customs which discriminate among citizens. It also states that traditional laws governing marriage and inheritance can be applied only by consent of those concerned. If there is no marriage contract, matrimony is based upon joint ownership of property under national law. Most women, however, are not aware of the law, and in practice may be deprived of rights upon death of a spouse or divorce. The basic tension is in the duality of a legal system with both legislated and traditional law.

3.17 Among many ethnic groups in the Soudan zone, traditional law prevails and inheritance passes from male to male. Under the law that often prevails in the Sahel zone, women have the right to inherit property, but sons inherit twice as much as daughters. In practice, some Sahelian women lose their inheritance when their brothers divide property. In some areas, when a husband dies, a brother or cousin traditionally inherits his possessions, including the widow and children. In some other areas, even if a woman has an individual plot, when her husband dies and there are no children, his parents take her land.

E. CREDIT TO RURAL WOMEN AND NGO SUPPORT FOR CREDIT

3.18 Rural women rarely have access to formal cash credit, but may have access to informal sources of credit and to credit in kind. During the *soudure* (hungry season) some women borrow millet and after the harvest and reimburse as much as two *koro* for each one borrowed. To accumulate cash savings, women sometimes organize into informal savings associations. Women may use this money to increase cereal stocks, finance family needs such as school fees, clothes, and medicine, purchase equipment and reimburse supplier loans. Several NGOs observe

that rural women can mobilize significant amounts of cash savings through *tontines*, while urban women organize the *azoumas* and *pari-ventes*.

3.19 The *azouma* is a type of social gathering hosted, in rotation, by group members to collect funds and presents. Participants spend a half or full day with the host who serves them meals. Around 5 PM money gifts are collected by a group member, who is a *griot*, or spokesperson. The amount is not fixed and donations to the host (the beneficiary) vary from CFAF 500 to 500,000 and the amount is left to the discretion of the participants. The *griot* then announces the names of participants and the amounts of their contributions and records this information in a book. At the next *azouma* the beneficiary (the former host) reimburses the donations with interest at a rate which is not pre-determined. The beneficiary is expected to reimburse more than the amount received; reimbursing the exact amount signals unhappiness with the new host. The total amount collected by each member varies between CFAF 100,000 to 4,000,000 and is sometimes used for the purchase of a house or for working capital.

3.20 The *pari-vente* is a club meeting that may include 10 to 30 members. Each member contributes an amount fixed by the club, which is collected during a social gathering and given to one member, on a rotating basis. The club is led by a president who designates the beneficiary of the collected funds. The amount of the contribution can vary between CFAF 5,000 and 500,000. The host provides food and music, and may also sell beverages. There are two types of *pari-vente*: the *'Djougournouma'* for which the collection of funds is organized between 10 AM and 6 PM and the big *pari-vente* for which funds are collected from 6 PM to dawn. The most widespread form of mutual assistance among women are *tontines*, which are called *paré* in Chad. As a rotating saving group, a *tontine* provides its members with the opportunity to save a fixed amount each day, week, or month --in contrast to the *azouma* or *pari-vente*. The amount is collected at the end of the term fixed by the group by one member, and equal shares are then distributed to each member.

3.21 When these informal arrangements are insufficient, people often organize themselves to qualify for assistance from the exterior. The ONDR extends credit to women in village associations (AVs) in the cotton zone in the form of inputs and equipment for processing and transport of cotton. However, women are not well represented in the AVs (only 9 percent in the Moyen-Chari) and their participation is not strong, and men often dominate meetings.

3.22 Several NGOs extend credit for revenue-generating activities to ensure food security when women form a group (of 8 to 30 persons) and establish a cash reserve and a record of monthly contributions (200 to 1000 FCFA each) for 1 to 2 years. The credit finances activities such as community gardens, collective management of motorized cereal or peanut mills, oil presses, animal-drawn carts, plows, construction of grain storage and small commerce. There are no national statistics on the number and growth of women's groups which began to form in the 1980s and have increased, becoming more prevalent in the south. The ONDR reports there are 562 female groups in both Logones and the NGO, SECADEV, reported 360 in 1995 in its operations in 7 prefectures. Since herder families are nomadic, NGOs find it difficult to group

Box 3.2
The Promotion of Rural Initiatives and Development Enterprises (PRIDE), Kenya

The PRIDE financial scheme in Kenya, is one of the promising credit programs that has been implemented in Sub-Saharan Africa. Its key features are:

- Members choose each other from people they know through other activities. This effectively uses geography/kinship, group liabilities and peer-monitoring mechanisms. Members must have businesses, preferably small informal ones.
- PRIDE groups are arranged in two levels. The lowest is the Enterprise Group (EG), a set of five people, usually from the same community or market center. Each loan application by one member of an EG must be guaranteed by all five. Ten EGs form a higher level, the Market Enterprise Group (MEG), which shares responsibility for repaying loans.
- The annual membership fee is 100 Ksh and 50 Ksh is paid weekly into a Loan Insurance Fund (LIF). The LIF is a forced saving element that reduces the risk of default and lowers transaction costs. Through the LIF, PRIDE can reimburse itself in case of default.
- Sixteen week of instruction are given before the first loan is made.
- First loans are limited to US$200, with each subsequent loan increasing by $200 up to a maximum of $1000. Interest is charged at 14.5 percent straight or 27 percent on a declining balance, compared to a commercial bank rate of 15.5 percent.
- Loans are guaranteed for one year with weekly payments of principal and interest. Transaction costs are 11 percent.
- Branches are expected to cover all recurrent costs after 18 months of operation, and capitalize loans through client savings after five years.

Source: Saito, Katrine, 1994.

female herders. The NGOs report that expansion of their credit services is limited by inadequate roads, and insecurity in some zones

3.23 The results of NGO work with women have been mixed. A weakness in some NGO operations is that women are under-represented in decision-making levels and that there are not enough personnel for supervision. Moreover, some women fear that obtaining credit would upset the social balance, since husbands often resist their wives' efforts to join groups. There have been reports that the security situation has also discouraged groups from reconstituting savings after funds were stolen by armed bandits. Chadian NGOs may wish to consider rural credit schemes that have worked well elsewhere in Africa (Box 3.2).

F. TRAINING AND EXTENSION

3.24 In the Soudanian zone rural women increasingly ask mosques, churches and national agricultural training centers (CFPA) to provide basic literacy and management training in Arabic or local languages (Brown, 1994). This provides some evidence that women believe that lack of education limits their ability to take better control of their lives, make more informed decisions and understand technology. They may also wish to avoid dependence upon men who keep their sales accounts, to avoid fraud, and want to read their children's school reports. Women in the Mayo-Kebbi expressed strong demand for commercial credit and agricultural equipment, while food processing technology was a priority request by women in Guera, Batha and Ouaddai.

3.25 Technical training and extension has sometimes failed to benefit women because the training was not designed for them and because of the scarcity of female extension workers. For example, the ONDR has not provided extension technology for agricultural activities where women predominate, in particular, food crops, and the processing and preservation of fish, meat and dairy products. The Government has tried, through the World Bank financed *PSAP*, to improve this situation by testing participative financing of food-processing equipment such as mills and presses. The project also attempts to train male extension agents to work with women and to recruit the few female graduates of agricultural schools.

3.26 Several NGOs offer extension as part of broader projects but few provide instruction in food processing and 'female' crops. However, training on themes linked to agricultural production is also provided in the 30 CFPAs in 7 prefectures. Sites may be far from villages and the quality of instruction varies, but female participation in CFPA courses in the two Logones and Tandjile was, nevertheless, 47 percent in 1994.

G. Policy Options for Improving Women's Contribution to Agriculture

3.27 It should be no surprise that no single policy message arises from this review, since women's productivity in Chad is a little studied subject. But it would not be possible to improve agricultural productivity in Chad without the participation of women who provide up to three-quarters of agricultural labor. It does appear that research into food crops raised by women and preparation of female-focused extension messages would help increase women's productivity. Better access to labor-saving technology for household and agricultural tasks such as fetching

Box 3.3
Female Extension Agents - the Women in Agriculture (WIA) program of Nigeria

The Women in Agriculture (WIA) program was initiated in Nigeria to improve the national extension system that had failed to recognize the importance of women farmers and was ineffective in helping them. Through this program, many of the 4, 500 home economists (HE), who had detailed knowledge of rural women and were farmers in their spare time, were transferred to an initially separate (now unified) extension service and given intensive training in agriculture and extension methodology. These WIA agents give agricultural advice to women, explain women's farming activities to male agents, and resume their traditional HE programs during the non-growing season. The target is to have an administrator and a training at state headquarters, and training in each zone, and an agent in each block (and cell, if possible). The WIA agents work more with women's groups than male agents, but male agents also have a target of 20 to 30 percent of female contact farmers. A WIA agent's time is split into 70 percent field production and 30 percent postharvest and home economics.

The WIA program, which is now fully integrated into the agricultural extension service, provides a broad spectrum of support for women farmers including:

- Skill Development Centers where tools and equipment are demonstrated
- Small Plot Adoption Techniques (test plots) targeted for the fields of all women contact farmers
- Skills and techniques to establish wood lots, and alley crops
- Promotion of small livestock keeping and such crops as soybeans to improve family nutrition

Source: Saito, Katrine, 1994.

water and wood would increase productivity by easing labor and time constraints. Another option is to encourage women to form affinity groups to obtain credit or save for economic activities, as this approach has been successful in Asia and elsewhere in Africa (Box 3.3). In may be that the most fundamental actions would be to improve basic health and education, the subjects of the next chapters.

4. EDUCATION AND DEVELOPMENT IN CHAD

A. THE CONTRIBUTION OF EDUCATION TO DEVELOPMENT

4.1 Education, being an investment in human capital, is a major instrument for economic and social development. This is especially the case with basic education. Most immediately, and obviously, education works to raise individual productivity, be it in the agricultural or market sector. But, education, and especially education for girls, has some very important secondary benefits. Women who have received even a few years of formal education are generally better informed about basic nutrition and health needs and so tend to have healthier, better nourished children; are less likely to suffer maternal mortality because they are more likely to plan and space their families and seek pre- and post natal care; are more receptive to adopting new technologies which improve natural resource use and have positive environmental benefits; and, are more likely to be active participants in the informal or formal economies. In all these ways, education works directly to address poverty. Education has further benefits: it contributes to the strengthening of the institutions of civil society, to national capacity building, and to good governance, all of which are increasingly recognized to be critical elements in the effective implementation of sound economic and social policies (Box 4.1).

Box 4.1
Education and Poverty Reduction

The low earnings of the poor are largely the result of their relatively low human capital endowments. Education can therefore make a significant contribution to the reduction of poverty. It confers skills, knowledge, and attitudes that increase the productivity of the labor of the poor by increasing their output as farmers and their access to jobs in both the formal and informal sectors. Studies have found that a farmer with four years of completed schooling has much higher productivity that one with no education. Education also makes workers in industry more productive. The creation of human capital is the creation and distribution of new wealth. It contributes to the reduction of both absolute and relative poverty, but it can take a whole generation to have an effect --in contrast to the more rapid effects of redistributing existing capital, through, for example, tax reform and land reform. Resources invested today in education may lead to less poverty only after several years, when the poor whose human capital has been enhanced start to benefit from increased earnings, greater ability in self-employment, and improved efficiency in the use of household resources.

Source: Priorities and Strategies for Education: A World Bank Review. World Bank 1995.

4.2 For a country such as Chad, it is important to note that the highest returns to education are derived from investments in primary or basic education. Estimates of the social and private rates of return are considerably higher for primary education than for secondary and higher education. In the low- and middle-income sub-Saharan countries, for instance, the social returns

to primary education are estimated to be over 24 percent, considerably more than the 18 percent return to secondary education and the 11 percent to higher education. This implies that African countries (including Chad) concerned with accelerating their economic growth, should consider concentrating the bulk of their education spending on the primary education level. Indeed, this has been the approach followed by developing countries, including the "Asian Tigers" which are now experiencing very high economic growth rates.

B. Provision of Education in Chad

4.3 Chad's education system is rooted in the traditional French education system which is based on the three "classical" subjects, language, reading and arithmetic. Pedagogic methods are largely didactic and teacher-driven, and instruction at all education levels is in French, not the local mother tongue. The system consists of two cycles, a primary cycle of 6 years duration and a secondary cycle of 7 years duration.

4.4 Chad is keenly aware of the need to improve coverage and quality in education provision. In the early 1990s, it developed an official education strategy, with the assistance of UNESCO, with the aim of addressing recognized shortfalls in the sector. This Strategy, known as the Education-Training-Employment Strategy, establishes both quantitative and qualitative targets for the sector. Further strategic thinking is needed in the sector to tackle some of the major constraints to the provision of mass basic education. What policies will reduce the actual length of the cycle, encourage community initiatives, build on the success of Koranic education, and promote various informal alternatives?

Table 4.1. Education Indicators and Expenditures in 9 African Countries

Country	*GNP/Capita $US*	*Adult Illiteracy Rate*		*Primary Gross Enrollment Ratio*		*Expenditure % of*		
		Male	*Female*	*Male*	*Female*	*GNP*	*Govt. Exp*	*(YR)*
Tanzania	120	21	43	71	69	5	11.4	90
Burundi	160	52	72	76	63	3.8	12.2	92
Malawi	170	28	58	84	77	3.3	10.3	90
Chad	180	87	95	63	32	2.2	n/a	94
Niger	220	79	93	35	21	3.1	10.8	91
Uganda	240	26	50	99	83	1.9	15	91
Mali	250	61	77	38	24	2.1	13.2	93
Nigeria	266	33	53	105	82	1.3	7.3	93
Togo	310	33	63	122	81	6.1	21.6	92

Sources: World Development Indicators, 1997; UNESCO Statistical Yearbook, 1996. Data on Chad is from MOE sources (1995/96) and the 1993 census.

Note: n/a - not available

C. Financing of Education

4.5 Chad allocated around 2.2 percent of its GNP to the education sector in 1994. This is somewhat lower than allocations in other African countries with comparable per capita GNP

levels. Burundi, Niger and Malawi, for instance, allocated over 3 percent to education. Interestingly, though, Chad's allocation is above those of several other countries whose primary Gross Enrollment Rates (GERs) are high (Table 4.1). Uganda for example, allocates only 1.9 percent of GNP to education but has primary GERs of 99 percent for boys and 83 percent for girls. These differences suggest there might be considerable scope for bringing about significant improvements in coverage within Chad's existing resource envelope, though additional resources would help push such efforts further (Box 4.2).

Box 4.2
Is there an Education Quantity/Quality Tradeoff?

In many countries, education projects and programs have focused on the supply side of education: education is a "production function" which takes teachers, training, books, etc. as its inputs to produce educated students as its output. While this view has been helpful to a point, it has encouraged many governments to feel that they face a tradeoff between "quantity" and "quality": whether to educate fewer children using more resources per child, or more children using less per child. However, recent experiences in several developing countries show that this view is misleading. Increasing the quality of education can increase demand for education. Put another way, by changing the way resources are used and by encouraging parental input, it may be possible to improve quality and so attract many more students at roughly the same total cost. The cost-effectiveness of expenditures on education could thus be improved. Government policy aimed solely at increasing the supply of inputs is therefore unlikely to succeed in increasing coverage unless demand factors -- parental perceptions and requirements of the system -- are addressed at the same time. Parental demand for education is essentially "latent"; it will only manifest itself when the education system fulfills their expectations of it.

Source: Adapted from "Pakistan. Improving Basic Education: Community Participation, System Accountability and Efficiency". World Bank. 1996.

4.6 Education finances in Chad come from three sources -- the public budget, donor financing, and private contributions. The proportion of finances derived from public sources is relatively modest, although some increase in public spending is evident over the past few years. Most of this increase has supported investment budgets which grew from 13 percent of Total Investment Budgets in 1993 to 23 percent in 1996 (Table 4.2). Current budgets have remained more or less steady, with close to 90 percent of these budgets being allocated to wages. Apparently, very little of the current public budget is spent on those factors most closely linked with education quality (textbooks, curriculum development, teacher training, etc.)

4.7 As public revenues expand in response to the oil windfall, there is a real prospect of increased revenues for the education sector and, possibly, an increase in the proportion of total public revenues allocated to education. To secure these resources, the sector will need to move quickly to develop, and build support for, a sound strategy based on a more efficient and equitable deployment of resources. This will improve the sector's ability to negotiate a share of the increased public resources, and will improve its ability to absorb and utilize these resources in ways that will increase education access and education outcomes.

Table 4.2. Public Budget for Education: 1993-96
(billions of CFAF)

	1993	1994	1995	1996
Education Budget	17.9	19.2	23.4	28.5
Current budget	6.9	8.9	9.2	10.1
Wage	6.4	7.7	7.7	8.7
Non-wage	0.5	1.2	1.5	1.4
Investment budget	11.0	10.3	14.2	18.2
Education current / Total current	14%	15%	15%	14%
Education investment / Total investment	13%	16%	20%	23%

Source: *Lois des Finances.*

Box 4.3
Involvement of NGOs in Education: The BRAC Story

In diversifying the supply of education in Bangladesh, the government recognized the contribution that non-governmental organizations (NGOs) can make to efforts to expand access and improve the quality of education for the country's children. NGOs now play a national role in Bangladesh's health and population programs.

The Bangladesh Rural Advancement Committee (BRAC), the largest NGO in Bangladesh, is well known for its rural development, credit, and health programs. In 1985, in response to requests from participants in its rural development programs, BRAC started the non-formal primary education (NFPE) program for 8-to-10 year-olds in twenty-two villages. Girls were given special emphasis. By late 1991, 6,003 schools, serving 11-to-16 year-olds as well as the NFPE age group, had been established. The program is free to students, except for school construction.

By 1992 more than 8,000 schools were operating, and plans were made to expand the NFPE program to 50,000 schools nationwide by 1995. Throughout, BRAC has been able to balance its expansion program with its quality goals.

Internationally, BRAC is a model for the non-governmental sector in educational expansion. It also illustrates how a combination of targeting, reduction in the length of the primary school cycle, and follow-through can dramatically increase girls' primary-school participation rates. While national education systems everywhere have the formal mandate to provide quality education to their populaces, such NGOs as BRAC, which have greater flexibility than government bureaucracies, may sometimes be able to reach target groups more effectively. Furthermore, BRAC's expansion program illustrates that NGOs need not necessarily be limited to small pilot projects but can also carry out larger-scale delivery programs.

Source: Priorities and Strategies for Education: A World Bank Review. World Bank 1995.

4.8 Donors finance almost all the non-salary recurrent budgets for education and all the public investment expenditures. Almost 40 percent of donor resources for education are used to finance school feeding programs. It is clear that long-term commitments are required from the different donor agencies, as the system, even with its low enrollment rates, is unsustainable with only local resources.

4.9 Private contributions are an important source of financing for the sector. Local communities pay the salaries of more that half the primary level teachers, albeit at derisory salary levels of around 10 percent of what a teacher earns in the civil service. Probably around 10 percent of total system costs are financed by parent groups. Ways should be found to encourage these efforts, for example, through subsidies of the salaries of qualified teachers employed by parent groups The increased involvement of Non-Governmental Organizations (NGOs)in the sector may however be a viable means of expanding access and improving quality, as Box 4.3 illustrates, although NGO capacity in Chad is currently very limited (Box 4.3).

Box 4.4
Guidelines for Allocating Education Resources

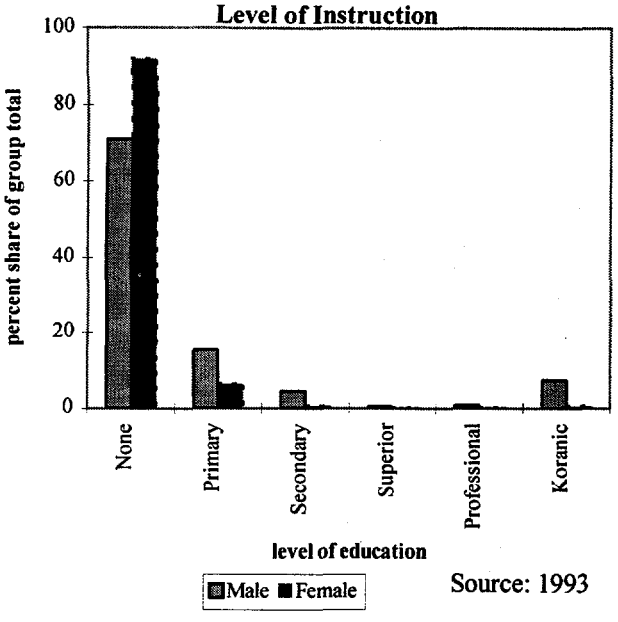
To achieve efficiency, education resources should be concentrated in a cost-effective manner where the returns to investment are highest. To achieve equity, governments need to ensure that no qualified student is denied access to education because of inability to pay. At the same time, and because the gap between the private and social returns is larger for higher education than for basic education, advantage should be taken of any willingness to pay for higher education by sharing its costs with students and their parents. Governments can also intervene. By bearing some of the risk, they can help correct the capital market failures that preclude financial institutions from lending for higher education. Combining these principals would result in a policy package of fees and efficient expenditure in the public sector. The elements of this package-which would have to be adapted to particular country circumstances-would usually be:

- The lowest possible fees for public basic education, combined with targeted stipends for households that cannot afford to enroll their children and with other forms of cost-sharing with communities.
- Charging of fees for upper-secondary education, again combined with targeted scholarships.
- Fees for all public higher education combined with loan, tax and other schemes so that students who cannot afford to pay the fees out of their own or their parents' current income may defer payment until they have income themselves. This fee system could be accompanied by a targeted scholarship scheme to overcome the reluctance of the poor to accumulate debt against future earnings of which they are not yet confident.
- A goal of quality primary education for all children as the priority for public spending on education in all countries.
- Efficient spending at the school and institution levels in the public sector.

Korea is an example of a country that follows most of these polices. Fees (including Parent-Teacher Association dues) account for only 2 percent of recurrent costs at the primary level but for 41 percent at the middle school level and 73 percent at the high school level. Overall, the private costs of education account for about 50 percent of recurrent costs for the entire education system. Public expenditure is heavily concentrated on basic education: 44 percent for primary education, 34 percent for middle and high school education, and 7 percent for higher education.

Source: Priorities and Strategies for Education: A World Bank Review. World Bank 1995.

Figure 4.1
Structure of the Population Aged 15 or More by Level of Instruction



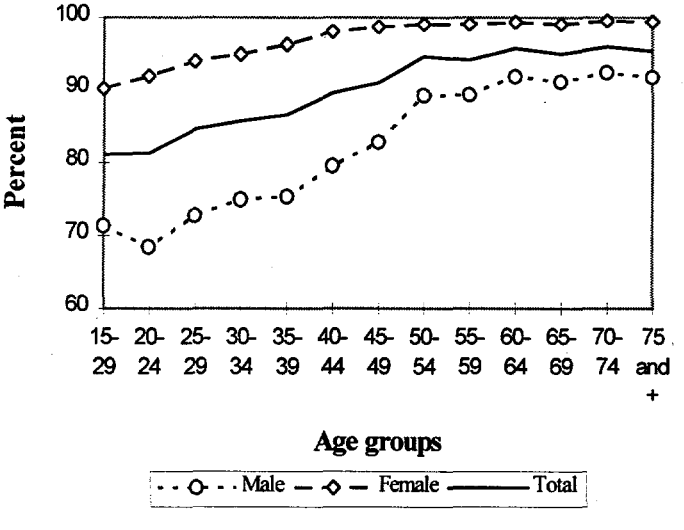
Source: 1993

4.10 There is also a need to look carefully at the allocation of public education resources across the board, at all levels, to ensure that they are allocated primarily to those levels which yield the highest social returns and which have the most immediate effects on poverty reduction (Box 4.4). In Chad, approximately half (FCAF 10.1 billion) of the public resources (current budget) is allocated to the primary level. Allocations to the secondary level are high at FCAF 3 billion while FCAF 2.5 billion is allocated to higher education, administration, and 'other' purposes.

D. Coverage and Performance of the Education System

4.11 As Figure 4.1 illustrates, education coverage in the past has been extremely low in Chad. Over 70 percent of the male population and over 95 percent of the female population over 15 years of age has received no formal education at all. Considerably less than 20 percent of the population over 15 years have received primary education and the proportion of the population with more than primary education is extremely low, being almost zero in the case of women.

Figure 4.2
Illiteracy by age and gender



4.12 Recent Gross Enrollment Rates (GER) data however, indicate that progress has been made over the past decade in improving coverage. But, this progress has not been systematic, as Table 4.3 indicates In recent years GERs for girls and boys have been rising, but they are still lower than those for 1990/91, especially, given that public expenditures on education have increased over this period. Another aspect of the trends in GERs that warrants attention is the disparity between coverage of boys and girls. The boys' primary GER of 63 percent is significantly higher than the 32 percent

Table 4.3
Primary School Gross Enrollment Rates

School year	Total	Girls	Boys
1990-91	59.3	36.4	82.7
1991-92	58.8	37.3	80.7
1992-93 a/	NA	NA	NA
1993-94 b/	46.1	30.2	61.6
1994-95	46.6	30.6	62.1
1995-96	47.9	32.0	63.4

a/ No statistics were published for 1992-3; b/ The apparent fall in enrollment rates in 1993/94 is due to the use of the new 1993 Census data.
Source: Ministry of Education.

Figure 4.3
Primary School Enrollment Rates, 1994/95

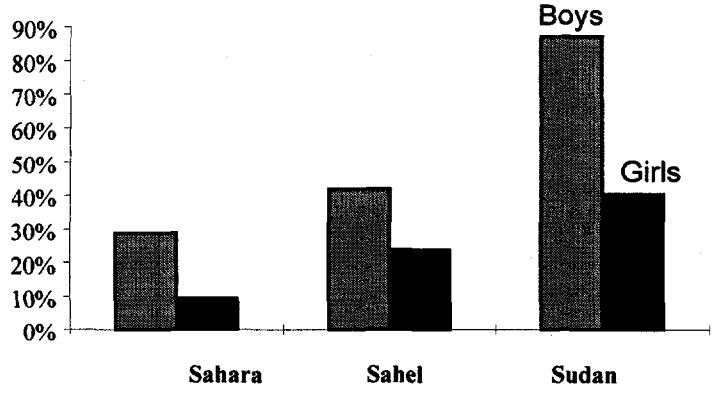
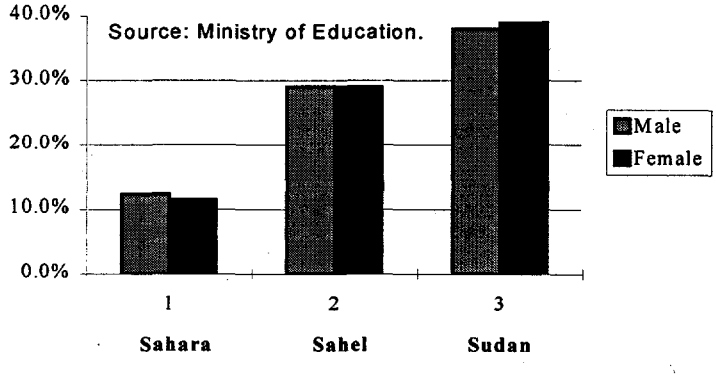


Figure 4.4
Primary School Repeat Rates, 1994/95



rate for girls. Also, these GERs compare unfavorably with GERs of other African countries with similar per capita GNP. While the primary GER for boys is above those for Mali and Niger, it is below those reported in many other comparator countries.

4.13 The history of limited educational access, in addition to low system efficiency, have left a legacy of high illiteracy among the adult (+15 year old) population. Information from the 1993 Census shows that the illiteracy rate for this population group is over 90 percent, being 87 percent for men and 95 percent for women. Even among the younger age groups, the illiteracy rate is over 90 percent. Figure 4.2 again makes it apparent that any achievements made in reducing illiteracy rates have been largely for men. Indeed, it appears that the gender gap in illiteracy rates is actually increasing rather than decreasing. It will be almost impossible to reduce poverty with such extraordinary illiteracy rates, and thus the development and launching of massive literacy programs for women as much as for men must be one of the highest priority actions over the coming decade. Such program

must be combined with the creation of village reading centers and other ways to maintain literacy skills. A literate farmer is considerably more productive than an illiterate; a literate parent is more likely to send her child to school.

4.14 Access to education is extremely uneven across geographic zones as Figure 4.3 illustrates. Primary enrollment rates are considerably higher, both for boys and girls, in the Soudan area but are far below the national average in the Sahara and Sahel regions.

4.15 Repetition and completion rates indicate that the sector's efficiency is low. Primary school repetition rates, for instance, are around 35 percent, amongst the highest of any country in the world. Interestingly, repetition rates differ sharply across the country's 3 geographic zones. Rates are considerably higher in the Soudan where enrollments are higher (around 35 percent) than in the Sahara (slightly more than 10 percent). It appears that a number of factors contribute to raise repetition rates, including an under-qualified and unmotivated teaching staff, the near-absence of textbooks and curriculum materials in many schools, prolonged and, prior to the 1995-96 school year, frequent teacher strikes (a consequence of non-payment of salaries) which disrupt student learning, and the requirement that all education be provided through the French or the classical Arabic medium which is not the mother tongue. Repetition is extremely costly and a major drain on any country's education resources. High repetition rates mean that the amount spent on getting one student through the education cycle is considerably higher than it should, or could, be. It also means that the few students who do manage to get into the system absorb a large amount of available education resources. Reducing the repetition rate would clearly help free up spaces in the system for children currently without access.

4.16 Little hard information exists on other important indicators of system efficiency. What is available, however, supports assumptions that efficiency is low. Primary education completion rates in 1995, for instance, were estimated to be around 22 percent. And, it is reported that a large proportion of children who manage to complete the primary cycle are not functionally literate.

E. Gender Equity of the Education System

4.17 Chad's education system evidently provides different groups with very disparate opportunities, both in terms of access and in terms of quality. The most marked inequities appear to be between genders and between groups living in different geographic regions/zones. Addressing inequities in education is important for several reasons, but principally because inequities tend to afflict the poor most gravely, so ultimately working to perpetuate poverty (Box 4.5).

Box 4.5
Improving Equity

Government typically has two fundamental concerns regarding equity. The first is to ensure that everyone has a basic education-the basic competencies necessary to function effectively in society. The second is to ensure that qualified potential students are not denied access to institutions because they are poor or female, are from ethnic minorities, live in geographically remote regions, or have special education needs.

Increased attention to equity will also increase efficiency. Considerable evidence now exists that improving the educational status of the poor, of women, and of indigenous people increases economic growth and reduces poverty. Investing in the education of girls from poor backgrounds sets off a process of inter-generational poverty reduction: educated women are more likely to send their own children to school.

Achieving equity and the first level of schooling is a matter of both increasing the demand for education and meeting that demand through financing and special measures. Financing is important at all levels for those who cannot afford to go to school-either because they and their parents cannot pay the associated costs or because the household cannot afford to lose their labor services. Special measures tend to be concentrated on the lower levels of education. They include recruiting more female teachers to provide role models for girls, making special education available, providing bilingual education in countries with linguistic diversity, and conducting health and nutrition programs. Taken together, these measures amount to providing universal access to learning (not just universal school attendance) at the primary level, which opens the way to equity at all levels of the education system.

Source: Priorities and Strategies for Education: A World Bank Review. World Bank 1995.

4.18 From Figure 4.3 it can be seen that regional differences in enrollment rates are extreme, and that gender inequalities are also severe in Chad's education sector. While it is true that access is certainly low for both genders (the GER in 1995/96 was about 48 percent), girl's GER is substantially below boys'. The primary GER for girls in 1995/96 was a mere 32 percent, compared with boys' 63 percent.

4.19 It could be difficult for an illiterate parent to have a clear idea of what the potential benefit might be by sending their daughters to school. Nevertheless, low demand could stem from parents making rational decisions about the economic costs and returns to girls' education. Although cultural norms and values definitely do influence parents' decisions towards girls' education, it appears that economic considerations are probably paramount. An ISSED survey of 675 parents revealed that parents, in general, were not strongly opposed to girls attending school. They were, however, not convinced of the benefits of school to girls, given the need for early marriage of girls (and receipt of the dowry), the high opportunity cost of girls' time in the household where they perform important domestic chores, and the low quality of education provided in the school system. And, almost 40 percent of parents reported that education had little value because there were no work opportunities for girls.

4.20 Poverty underlies low parental demand for girls' education and low enrollments. Families which are poor can only afford to educate a few of their children, and they typically choose to educate the boys since girls "marry out" of the family, have very limited prospects for employment, and are typically responsible for important household chores (looking after siblings, fetching water, cooking, cleaning, etc.) which raises the opportunity costs of their time well above boys. A study of the socio-economic factors influencing girls education was carried out with the assistance of UNESCO in four prefectures (Baatha, Kanem, Mayo-Kebbi and Tandjile) in 1994. Interviews indicated that that girls spend substantially more time before and after school on chores than boys. Girls reported that 80 percent of their time before school and 73 percent of the their time after school was spent on domestic chores. By contrast, boys reported spending 39 percent of their time before school and 50 percent after school on domestic chores and animal herding.

4.21 In most countries where education quality is low, it tends to affect girls' enrollment and retention more than boys. Again, this is because of the high opportunity costs of girls' time. Quality is very likely a factor affecting girls enrollment rates in Chad - teacher attendance is poor, repetition rates high, and textbooks and other learning materials very scarce.

4.22 Early marriage and the desire to realize a dowry also appears to constrain girls' education in Chad, particularly at the upper primary and secondary levels. Eighty five percent of teachers surveyed in the ISSED study reported that early marriage is the principle reason why girls drop out in the early years of secondary school. Sixty nine percent of fathers responding to the survey stated they would like to marry their daughters by age 15 in order to obtain a dowry to compensate them for the cost of marrying the girls' mothers.

4.23 The high level of system inefficiency, especially in rural areas mean that the few children who complete primary school take nine or more years to do so. With girls not entering school until the age of six or seven, by the time a girl graduates she will be beyond the age of puberty and be of a marriageable age. If girls are to be attracted to school, the length of schooling must be reduced, as was done in the BRAC case --probably no longer than four years (Box 4.3). It is also essential to organize any education program for girls in their own village, to further reduce the opportunity costs of schooling, and to increase girls safety and security. This will involve considerable changes in the approaches used and place greater emphasis on informal and multi-grade approaches.

4.24 Geographic imbalances in education coverage are of importance in Chad. As Figure 4.3 shows, coverage in the Soudan zone is substantially higher than elsewhere, with around 85 percent of boys and slightly less than 40 percent of girls being enrolled. This contrasts sharply with coverage in the Sahara zone where about 30 percent of boys and less than 10 percent of girls have access. Even within the Soudan zone, however, coverage is uneven: about 50 percent of the primary level enrollments are in 3 of the 14 prefectures (Char-Baguirmi, Moyen-Chari, and Mayo-Kebbi).

Box 4.6

NGOs can be effective vehicles for increasing girls' enrollment and education outcomes
The Cambridge Female Education Trust (Camfed) in Zimbabwe

Camfed was established in 1991 to provide financial support to girls in primary and secondary schools in rural Zimbabwe. All costs of the girls' education are covered by Camfed, which also provides some material needs of the schools by linking them with schools abroad. Sewing cooperatives are part of the program to provide employment and income-generating opportunities for girls leaving school.

Girls who want to continue their education, but whose families do not have the resources to support them, are identified by Camfed village committees, whose members include parents, community workers, head teachers, teachers at local primary and secondary schools, district education officials and Camfed staff.

The design and evolution of the Camfed scheme is based on continuous research and consultation with the communities involved. Teachers, parents and the community are actively involved in administering and developing all aspects of the scheme. Dialogue with parents, school staff and Camfed seeks to enhance the social environment in which girls can grow and learn. Balanced enrollment between boys and girls is one of the objectives and field workers talk to parents about the need to provide time and opportunity for girls to do their homework.

Attendance of the girls has been excellent and participants are achieving good academic results. Parental support to the scheme is growing; no parents have turned down the offer of support for their daughters. Additionally, parents feel more comfortable about their daughters' physical safety in school, believe they have greater input into what is taught in school, and are seeing possible future income opportunities for girls following their schooling.

Source: Girls and Schools in Sub-Saharan Africa: From Analysis to Action. A. Odaga and W. Heneveld. World Bank. 1995.

4.25 Addressing these inequities - gender and geographic - will, in the longer term, go a long way towards tackling poverty in Chad. The Ministry of Education has a group devoted to increasing the enrollment of girls. They have had some success with public relations and labor-savings projects, but it is too early to reach conclusions about the approach. The question, however, is how to reach these hard-to-serve groups given public budget constraints. Improved system efficiency, adoption of more creative financing options (including possibly scholarships, and block grants), and encouragement of non-profit NGO involvement in education provision are actions warranting further consideration (Box 4.6).

5. HEALTH

A. HEALTH AND NUTRITION CONDITIONS

5.1 The health situation in Chad remains precarious despite the efforts of the Ministry of Health during the past few years. In 1993, according to the Census Bureau, life expectancy at birth was only 50 years and mortality rates, especially of pregnant women and infants, were high (Table 5.1). The principal causes of mortality and morbidity were infectious and parasitic diseases (including most of the tropical diseases), pregnancy-related conditions, and malnutrition. Fever, usually an indication of infections or diseases, cough, muscular and articular pains, traumas, and diarrhea continue to be the principal reasons for consultations in health facilities (Table 5.2 and Annex A Table 7).

Table 5.1
Health and fertility Indicators: 1993

Indicators	Chad 1/	Sub-Saharan Africa 2/
Life expectancy at birth (years)	50	52
Mortality rate (per thousand)	16.3	15
Infant mortality (per thousand)	132	93
Child mortality (per thousand)	222	172
Maternal mortality (per 100 thousand)	800	n.a.
Fertility rate (per thousand)	41	44
Natural demographic growth (%)	2.47	2.9
Fertility rate (% of women)	5.6	6.2
Modern contraceptive rate (%)	0.56	n.a.

1/ Census, 1993; 2/ World Bank.

5.2 In addition, tuberculosis, leprosy, and poliomyelitis are still prevalent. Sexually transmitted diseases are highly prevalent and about 3 to 4 percent of blood donors at the National Reference Hospital had syphilis in 1993, but the program of STD control is not very developed. With regard to AIDS, data from four sentinel sites indicate that the prevalence of HIV is increasing. The number of new cases registered annually increased from 10 in 1989 to 1010 in

Table 5.2
Health Problems: 1994
(Number of new cases per 1,000 inhabitants and by age at health centers)

Health problems	0-11 months	1-4 years	> 5 years	Total
1. Acute respiratory infections (all cases)	246	86	---	---
2. Diarrhea	175	57	8	21
3. Malaria (all cases)	190	86	35	47
4. Conjunctivitis	76	23	8	13
5. Dysentery	26	22	8	10
6. Cough <15 days	24	8	5	6
7. Measles	18	12	1	3
8. Urinary tract infections (all types)	---	---	12	---

Source: *Annuaires de Statistiques sanitaires du Tchad, Année 1995*

1993. Among the new cases, 52 percent were in the 20 to 39 years of age group, 98.5 percent of transmission was heterosexual and 1.5 percent from mother to child. In 1995, 88 percent of registered cases were in N'Djaména and Moundou. The prevalence rate among women is about 3 percent, consequently, with a fertility rate of 41 per 1000, about 8,000 pregnant women are seropositive, of whom 30 to 40 percent will transmit HIV to their child. Among blood donors, HIV prevalence has increased from 2.6 to 3.7 percent in N'Djaména and from 3.1 to 7.9 percent in Moundou. Projections made on the basis of available data show that HIV prevalence among adults 16 years and older will increase from 2.9 percent in 1994 to 5 percent in 1999.

5.3 Preventive activities, such as vaccination and prenatal care, reach only a small portion of the population. Some progress is being observed in areas such as anti-tetanus vaccination of pregnant women, as about half of the pregnant women were immunized during pregnancy in 1995, Infant vaccination coverage remains low although it increased from 6 percent in 1992 to 13.3 percent in 1995. In sum, the overall health situation is alarming.

5.4 Nutrition-related problems are frequent. Vitamin A and iron deficiencies are widespread throughout the country, affecting a significant number of adults and children. In particular, iron deficiency is highly prevalent among pregnant women with the rate at the National Reference Hospital reaching 70 percent. Malnutrition is attributable to household food insecurity and to conditions that can be readily targeted, including poor weaning practices, lack of clean water, and poor sanitation and hygiene. Among children 0-5 years old, malnutrition (less than 80 percent weight for height) is highly prevalent especially during the rainy season prior to the harvest. Rates of severe malnutrition of 5 to 10 percent are routinely recorded in some rural areas during years of "normal" rainfall, increasing to 15 percent and higher in years of drought or conflict, such as 1984-85 and 1991. Although there is little data to support this conclusion, the prevalence of chronic, as opposed to severe malnutrition, among children is also believed to be high and by no means limited to rural areas. In N'Djaména it is estimated that about 10 percent of children between the age of 6 months and 5 years are malnourished. The available studies of malnutrition cover N'Djaména and the Kanem and are consistent with the hypothesis of widespread chronic malnutrition (Annex A Table 5).

B. National Health Policy

5.5 The Government of Chad has responded to these poor health conditions by developing a National Health Policy based on the concept of primary health care adopted by the Alma-Ata World conference in 1978. The objective is to improve primary health care coverage by:

1. Reducing the concentration and centralization of management of the health sector by putting in place the three-tier system adopted in 1988 and delegating more responsibility for the implementation of health policies to the health districts. The regional level, where national policies are adapted to the regions, supports the districts in technical matters. The central level retains the responsibility of policy formulation, monitoring, supervision, and evaluation and makes decisions regarding investment and functions in the sector;

2. Strengthening community participation in the management of the health system. To ensure accessibility to health care and to information on health improvement, beneficiaries are to be

associated with the administration of health services at the operational level (districts and responsibility zones);

3. Introducing a Public health Coverage Plan *(Plan de Couverture sanitaire)* which includes facilities managed by NGOs, denominational groups and cooperatives; and

4. Adopting an essential drug policy based on the use of generic drugs, developing an essential drug list, reorganizing the pharmaceutical sector and instituting cost recovery in health facilities.

5.6 This strategy was prepared from 1990 to 1993 in collaboration with the country's development partners, who committed themselves to support it at the January 1993 Sectoral Round Table. The Ministry of Public Health (MOPH) has taken steps to implement this policy. The Ministry underwent a major reorganization in 1991 allowing it to better support decentralized and integrated health, nutritional and family planning services. Moreover, the plan seeks to: (i) increase accessibility and utilization rates of existing facilities, (ii) improve the quality of services; (iii) set up health committees which are to ensure basic health care for their communities, provided that these communities share the responsibility for meeting operating costs of their health facilities; and (iv) increase the health budget at the national level. However, despite the transfer of responsibility that gives more autonomy to the prefectoral health delegations, resources remain mostly centralized. For fiscal year 1997, credits are to be delegated to the prefectures but the mechanisms for the transfer of financial resources were not in place as of mid-May 1997. The lack of resources at the regional level often causes delays and weaknesses in supervision, and sometimes prevents the execution of activities.

5.7 The reduced concentration of health sector management is underpinned by a referral system which calls for each health facility to provide a well defined packaged of activities, the complexity of which increases with the level of service delivery. At the periphery, a health district that covers a population of 100,000 to 250,000 has two levels: the first level provides the services included in the Minimum Package of Activities (MPA) to a population of about 10,000 who reside in a well defined "*zone de responsabilité*"[1]. The second level is the district hospital which is responsible for the supervision of health centers and the provision of services included in the Complementary Package of Activities (CPA, Table 5.3).

5.8 At the regional (intermediate) level, the Regional Medical Officer (*Délégué préfectoral*) is responsible for implementing the national policies and programs and overseeing the planning, management, and supervision of all health activities in the region. The region also has a prefectoral reference hospital which provides more specialized services than the district hospital. The central level, which has the only national reference hospital, has a normative role: it prescribes the standards and develops health policies, chooses strategies to implement them, allocates resources and

[1] There are 633 *zones de responsabilité,* of which 373 have a health center. There are 48 health districts, 28 of which are functional according to the definition used by the *Division du Système d'Informaiton sanitaire* (DSIS), i. e. have at least one physician, a reference hospital which functions, and a regular supply of essential drugs. Finally, there are 14 regions that correspond to the administrative regions, i.e. the *Préfectures.*

coordinates training. It has primarily a role of coordination and supervision of health activities and of control and monitoring and evaluation of programs. Finally, it is responsible for mobilizing fiscal revenue at home and resources from donors for the financing of quality health care, accessible to all.

Table 5.3
Minimum and Complementary Packages of Medical Services

Services included in the minimum package of activities delivered in health centers (first peripheral level)	Services included in the complementary package of activities delivered in district hospitals (second peripheral level)
- Basic curative consultations - Infant consultation (including vaccination and nutritional screening) - Maternal consultations (including prenatal consultations, deliveries and family planning) - treatment of chronic diseases (including tuberculosis, leprosy and malnutrition) - health education and social mobilization - Community activities - Reference to the district hospital	- Emergencies (medical and surgical) - High risk deliveries and deliveries with complications referred from the first level - Hospitalization - Laboratory tests for diagnostic purpose - X-rays for diagnostic purpose - Reference to the second level of care

5.9 The 59 percent of the *zones de responsabilité* that now have a functional health center reach 65 percent of the population (Table 5.4). However, only about half of the population of the these health zones really have access to basic health services (because of distances, lack of roads, etc.), consequently only about 35 percent of the Chadian population is covered by modern health services. It should be added that the quality of services provided is often mediocre or poor because of several factors: insufficient equipment, lack of water, irregular supply of drugs, and above all, shortage of qualified health personnel.

Table 5.4
Health infrastructures in Chad in 1993

- 1 national reference hospital
- 13 prefectoral hospitals (12 of which are functional)
- 25 district hospitals (16 of which are functional)
- 373 health centers for 633 *zones de responsabilité*

5.10 The shortage of qualified health personnel, in particular, of para-medical personnel, is particularly acute in Chad. As shown in Table 5.5 below, the ratios found in Chad are greatly inferior to the WHO's norms: there are about one-third of the recommended number of physicians, fewer that one-tenth of the registered nurses, and one-fourth of the registered midwives. This shortage arises because: (i) no new personnel have entered the system for the last four years because the school for para-medical training has been closed; (ii) the system is concentrated in the capital; and (iii) personnel, buildings and money are distributed unequally

throughout the country[2]. At present, the MOPH itself classifies 35 percent of its personnel as "non qualified" and some health centers, in rural areas, are operated by personnel that have no formal health training. In addition, the quality of training has been poor in the past and many personnel, although trained, are not providing good quality services.

Table 5.5
Health Personnel

Number of each category of personnel	Ratios	Average in Sub-Saharan Africa	WHO's norms
214 Physicians	29,000/inhabitants	9,000/ inhabitants	5-10,000/ inhabitants
239 Registered nurses	26,000/ inhabitants	2,000/inhabitants	3,000/ inhabitants
130 Registered mid-wives	11,125 women 15-49 of age	n.a.	3,000/women 15-49 of age

C. FINANCING OF THE HEALTH SYSTEM

5.11 Budget expenditures for health have been increasing, although not as rapidly as hoped by the Government. In 1996, health budget expenditures represented 7.5 percent of the national budget and committed health expenses accounted for 7.4 percent of the national budget, up from, respectively 3.9 percent and 2.5 percent in 1988 (Table 5.6 and Annex A Table 21). Salary expenditures have been decreasing as a share of the health budget. They represented 92 percent of health expenditures in 1986, but accounted only for 52 percent of health expenditures in 1996. Despite this substantial effort, Chad does not meet the basic needs of its population. The Government is fully aware of its lack of resources and recognizes that it must rely on external donors to meet a substantial portion of its health system funding needs. Since 1989, external aid has represented more than 75 percent of all health expenses of the public sector (Table 5.7).[3] In 1996, the Government spent about US $1.30 per inhabitant; external aid,

Table 5.6
Evolution of the Health Budget

Year	Health budget/Govt budget	Committed health expenses/ Govt budget	% Personnel expenses of MOPH	% Operating expenses MOPH
1986	3.0	3.8	91.9	8.1
1987	2.9	2.9	87.2	12.8
1988	3.9	2.5	88.5	11.5
1989	4.2	3.0	88.1	11.9
1990	4.3	3.8	74.2	25.8
1991	5.1	5.3	71.4	28.6
1992	6.0	4.2	72.3	27.7
1993	7.7	5.8	74.8	25.1
1994	4.6	3.3	60.0	40.0
1995	6.1	4.3	65.0	35.0
1996	7.5	7.4	52.4	47.6

Source: Ministère de la Santé publique, Division des Ressources financières, May 1997

2 The ratios for the following three types of health personnel vary greatly from one pefecture to another: from 32,510 to 440,342 inhabitants per physician, from 14,121 to 92,291 inhabitants per registered nurse (*infirmier diplômé d'Etat*) and from 82749 to 440,342 inhabitants per registered mid-wife.

3 If private health expenses are added to expeses for the public sector, external aide represented only 60% of all health expenses in 1996.

which was about 70 percent grants and 30 percent loans, represented about US $3.20 per inhabitant. The total expenditures were about US $ 4.5 per inhabitant, which is relatively low (Ministère de la Santé publique, 1996). An analysis done by the World Bank (*Better Health in Africa*) indicates that the cost of a basic health system such as Chad wants to establish totals about US $10 to 14 per person per year. Apart from investment support to build, renovate and equip health facilities, donors are financing essential drugs, training, and a large portion of operating costs. Some are also providing assistance in the management and operation of health facilities. Given the serious resource constraints and the unmet demand for services, donors are expected to play a major role in the health sector for the foreseeable future.

Table 5.7
Public and private health expenses by financing source

	Public expenses		Private health expenses		Total expenses	
	CFAF	percent	CFAF	percent	CFAF	percent
MOPH budget	3.397.748	25	0	0	3.397.748	18
Private financing	0	0	4.000.000	80	4.000.000	22
External Aid	9.950.483	75	970.566	20	10.921.049	60
Total	**13.348.231**	**100**	**4.970.566**	**100**	**18.318.797**	**100**

Source: *Aide Extérieure à la Santé, 1996*, Ministère de la Santé publique, Direction de la Planification, (Project TED/95/005-PNUD-OMS

D. WOMEN'S HEALTH

5.12 In addition to health problems that are common to the whole population, women encounter special problems linked to pregnancy and child birth. Maternal mortality is the main cause of death among women of reproductive age. The rate in Chad is one of the highest in the world at more than 800 per 100,000 live births. In 1993, a study at the National Reference Hospital indicated that, among the direct causes of maternal deaths were eclampsia (31.5 percent), post-partum and post-abortum infections (respectively 21.1 percent and 10.4 percent), hemorrhage (10.4 percent), hepatitis during the pregnancy (21.4 percent) and renal and vascular problems (5.2 percent).

5.13 Many indirect causes contribute to maternal mortality: (i) adolescent pregnancy: more than 5.5 percent of pregnant women are less than 15 years old; (ii) difficult access to antenatal, obstetric and postnatal care, since only about 30 percent of pregnant women have antenatal care, less than 15 percent of deliveries are attended by qualified personnel and postnatal care is almost non-existent; (iii) lack of child spacing (modern prevalence rate is 0.56 percent); (iv) clandestine abortions: although data are not available, anecdotal evidence shows that a large number of pregnancies, both within and outside of marital union, are unintended; (v) lack of hygiene; and (vi) low literacy among women. In addition, during their pregnancy , women encounter numerous health and nutritional problems and other health problems such as infections and parasites. Malaria for instance is more serious for pregnant women because it contributes to anemia and can cause miscarriages. Prophylactic treatment of pregnant women is a recommendation of the malaria program, but few women can practice it. Urinary infections, hepatitis and hypertension are also frequent among pregnant women.

E. Female Genital Mutilation

5.14 An additional concern is female genital mutilation (FGM), which poses a risk to women's health, as its physical and psychological effects on girls and women can be traumatic and affect their sexual and reproductive health. Nevertheless, this practice is widespread in both the southern and northern regions of Chad. The issue of FGM and its consequences are still shrouded in a veil of silence and often officially ignored in Chad.

5.15 In Chadian communities, the types of FGM practiced are clitoridectomy, which involves the partial removal (practiced by the Sara population) or total removal (practiced by the Moslem population) of the clitoris. Generally called 'excision,' this is often linked to the initiation of girls into adulthood and more importantly into the status of a woman of acceptable morals and dignity. Excision is practiced on girls between 6 to 14 years old, and girls are grouped by age once a year to undergo this initiation practice outside the village, where they remain for a few days to receive instruction on endurance and womanhood. The procedure is generally performed by traditional practitioners belonging to a special group. FGM is practiced among both educated and illiterate, and rural and urban women.

5.16 According to a 1991 survey, excision is widely practiced in seven prefectures, Moyen Chari, Logone Occidental, Chari-Baguirmi, Biltine, Salamat, Ouaddai, and Guera (Map 5.1). The practice is strongly supported and performed by the victims themselves, women and girls, while the majority of men are opposed to it. About 68 percent of women in the south, 85 percent of women in the central area and 62 percent of women in N'Djaména favored excision; whereas 85 percent of men opposed the practice. In the opinion of many women, the practice is an act of honor and the 'uncircumcised' are stigmatized by their peers who consider them of a lower status and exclude them from important rites, such as funerals, which can be attended only by those who are initiated. As a result, some uncircumcised girls, despite parental disapproval, secretly join their peers to undergo the procedure. Furthermore, some adult women under peer pressure accept the risks of undergoing the procedure.

5.17 A service fee is charged for the procedure and circumcisers often derive significant income from the operation. The amount of the fees varies among Islamic to Christian societies and can be paid in cash or in kind. The treatment of the wound can result in high expenses in the case of complications such as hemorrhaging and blood poisoning caused by unsanitary conditions. After recovery, a costly ceremony to celebrate the end of the initiation period is organized where relatives and friends of the circumcised are invited to eat, drink, and dance. For Moslems, the passage to womanhood is the time when circumcisees adopt the clothing of women (veil and *abaya*, or long robe), an additional expense.

5.18 The relationship between FGM and health is not obvious to many women, yet this practice often causes a risk to women's health and sometimes life. After the operation, the wound is often sprinkled with herbs and other substances which provide an excellent environment for bacterial growth and infection. Complications and health hazards of clitoridectomy are: (i) clitoral tumors (neuroma) that can lead to primary infertility, painful

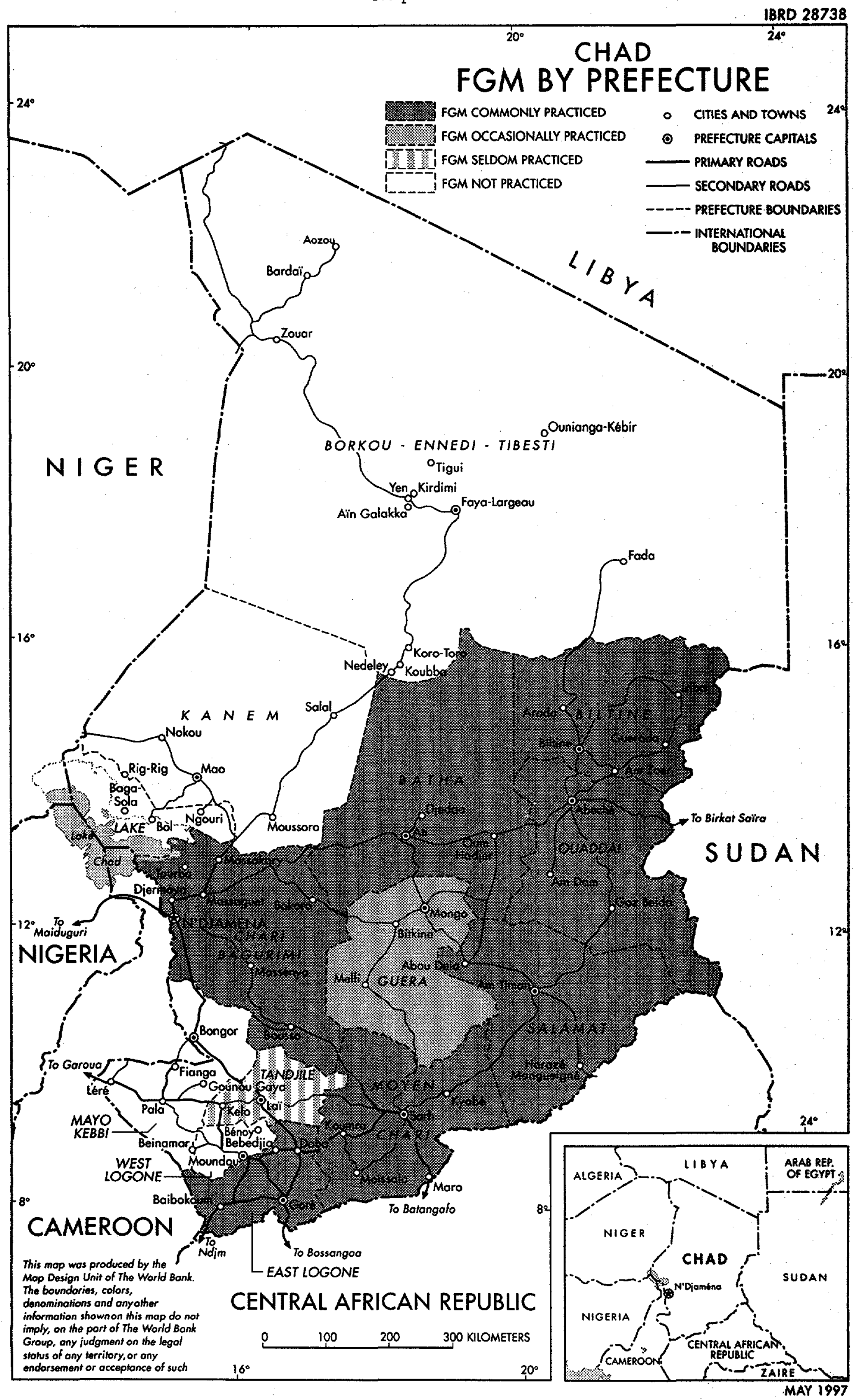
sexual intercourse (dyspareunia); (ii) damage to the urethra and its surrounding tissues which may result in incontinence; and (iii) difficult childbirth.

5.19 Although there is no direct relationship, between FGM and the productivity level of women, FGM may affect productivity through the loss of labor through increased mortality and morbidity, disability arising from scarring and other long-term complications, and loss of household resources because of the treatment of complications.

5.20 Until now, little effort has been deployed in Chad by either Government or civil society to address issues relating to the practice. No law or regulation exists to prohibit the practice or to punish the practitioners. Few institutions exist to combat such practices and little sound research has been conducted on either the physical or the psychological well-being of children and the psycho-sexual health of women; currently the Department of Women's Affairs (*Direction de la Promotion Feminine*) is responsible for FGM. In 1994, a Committee for the Fight against Traditional Practices (*Comité National de sensibilisation et de lutte contre les pratiques traditionnelles*), was established by concerned professional women from different backgrounds to educate the population on the consequences of the FGM. The Committee, composed of medical personnel, sociologists and journalists, operates mainly in N'djaména on a part-time basis with an all-volunteer staff. With the assistance of WHO and international NGOs, the Committee carried out education campaigns in Sarh and Abéché (February and March 1997) during which branches were created in both provinces. Since then, the Committee has carried out seminars and workshops and is attempting to working with religious leaders, although this has been proven difficult in the past.

5.21 According to the majority of men and women interviewed during the 1991 study, the best solution to discourage or eradicate FGM would be gradual change of cultural attitudes through effective education programs. Coercive measures, through laws and regulations, were opposed since these would have little impact on attitudes and encourage clandestine procedures that risk women's health and lives.

Map 5.1


IBRD 28738
CHAD
FGM BY PREFECTURE
FGM COMMONLY PRACTICED
FGM OCCASIONALLY PRACTICED
FGM SELDOM PRACTICED
FGM NOT PRACTICED
CITIES AND TOWNS
PREFECTURE CAPITALS
PRIMARY ROADS
SECONDARY ROADS
PREFECTURE BOUNDARIES
INTERNATIONAL BOUNDARIES
LIBYA
NIGER
SUDAN
NIGERIA
CAMEROON
CENTRAL AFRICAN REPUBLIC
BORKOU - ENNEDI - TIBESTI
KANEM
LAKE
BATHA
BILTINE
OUADDAI
GUERA
SALAMAT
CHARI BAGUIRMI
TANDJILE
MOYEN CHARI
MAYO KEBBI
WEST LOGONE
EAST LOGONE
Aozou
Bardaï
Zouar
Ounianga-Kébir
Tigui
Yen
Kirdimi
Aïn Galakka
Faya-Largeau
Fada
Koro-Toro
Nedeley
Koubba
Salal
Nokou
Mao
Rig-Rig
Baga-Sola
Bol
Ngouri
Moussoro
N'DJAMENA
Mongo
Bitkine
Abou Deia
Melfi
Am Timan
Bongor
Fianga
Léré
Pala
Moundou
Baibokoum
Goré
Doba
Sarh
Kyabé
Maro
To Maiduguri
To Garoua
To Birkat Saïra
To Batangafo
To Bossangoa
To Ndjm
0 100 200 300 KILOMETERS
This map was produced by the Map Design Unit of The World Bank. The boundaries, colors, denominations and anyother information shown on this map do not imply, on the part of The World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such
ALGERIA
ARAB REP. OF EGYPT
ZAIRE
N'Djaména
MAY 1997

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ANNEX A

STATISTICAL TABLES AND CHARTS

Annex A Table 1

Structure of the Population, 1993

(Percent)

Age Group	Urban			Rural			Total		
	male	female	all	male	female	all	male	female	all
Aged less than 20	28.7	27.5	56.2	29.2	29.3	58.5	29.1	28.9	58
Aged 20 to 59	20.8	18.8	39.6	15.7	20	35.7	16.7	19.9	36.6
Aged 60 and +	2	2.2	4.2	2.9	2.9	5.8	2.7	2.7	5.4
Total	**51.5**	**48.5**	**100**	**47.8**	**52.2**	**100**	**48.5**	**51.5**	**100**

Annex A Table 2

Index of residential mobility

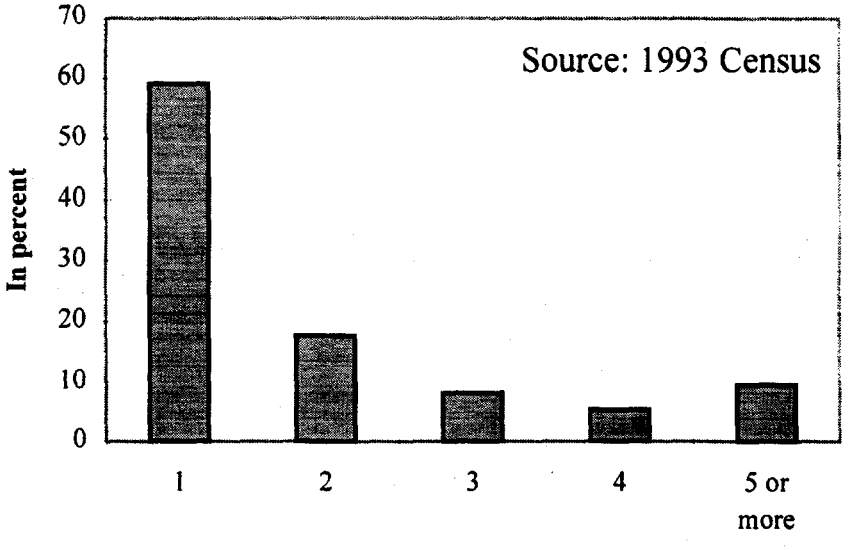
Prefecture	Population	Migrant Population	Index of residental mobility
Batha	339.38	114.39	33.71
BET[1]	69.48	21.47	30.9
Biltine	187.71	45.14	24.05
Chari Baguirmi	579.9	91.31	15.74
Guéra	313.03	88.41	28.24
Kanem	320.59	64.83	20.22
Lac	229.06	19.18	8.37
Logone Occidental	448.84	88.23	19.66
Logone Oriental	376.87	81.81	21.71
Mayo Kebbi	775.13	99.21	12.8
Moyen Chari	699.73	130.34	18.63
Ouaddai	513.75	97.39	18.96
Salamat	131.41	21.24	16.16
Tandjile	473.79	104.57	22.07
N'Djamena	270.36	70.76	26.17
Total	**5729.03**	**1138.28**	**21.16**

[1] BET: Borkou-Ennedit-Tibesti

Source: 1993 Census

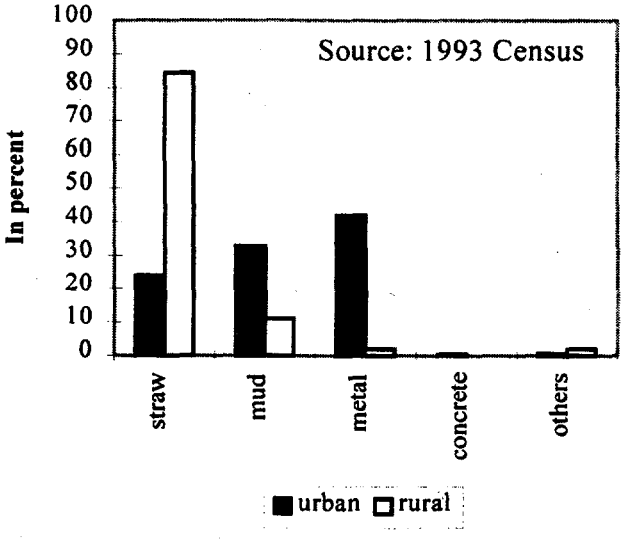
Annex A Figure 1

Distribution of Homes by Number of Rooms



Annex A Figure 2

Distribution of Homes by Type of Roof



Annex A Table 3

Households Access to Toilets (% points)

Préfectures	Latrines	Modern Pits	Nature	Total
Sahara	**10.7**	**0.8**	**88.6**	**100**
BET[1]	13	1.3	85.7	100
Biltine	8.3	0.2	91.5	100
Sahel	**14**	**0.6**	**85.4**	**100**
Batha	8.7	0.3	91	100
Chari-Baguirmi	47.8	1.5	50.7	100
Guéra	8.6	0.2	91.2	100
Kanem	7.4	0.4	92.2	100
Lac	4	0.3	95.7	100
Ouaddaï	9.7	0.4	89.9	100
Salamat	11.7	0.9	87.4	100
Sudan	**16.4**	**0.7**	**82.9**	**100**
Logone Occidental	20.6	1.1	78.3	100
Logone Oriental	11.6	0.4	88	100
Mayo-Kebbi	16.1	0.7	83.2	100
Moyen-Chari	22.7	0.7	76.6	100
Tandjilé	10.9	0.7	88.4	100

[1] BET: Borkou-Ennedit-Tibesti

Annex A Table 4

Household Access to Water (% points)

Préfecture	Not Potable	Potable
Sahara	85.9	14.1
BET[1]	85.4	14.6
Biltine	86.4	13.6
Sahel	74.5	25.5
Batha	74.4	25.6
Chari-Baguirmi	57.3	42.7
Guéra	73.2	42.7
Kanem	78.4	26.8
Lac	75	25
Ouaddaï	93.2	6.8
Salamat	70	30
Sudan	83.1	16.9
Logone Occidental	76.2	23.8
Logone Oriental	90.3	9.7
Mayo-Kebbi	80.6	19.4
Moyen-Chari	75.8	24.2
Tandjilé	92.5	7.5

[1] BET: Borkou-Ennedit-Tibesti

Annex A Table 5

Estimates of child Malnutrition in N'Djaména and the Kanem

Date	Wasting[1] (in % of sample)	Ages	Region	Source
May, 1996	7.4	Less than 2 years old	N'Djaména	Yomadjioutengar, et. al (1996)
May, 1995	10.1	Btwn. 6 months & 5 years	N'Djaména	Rocaboy (1995
Feb-March, 1996	25.3	Btwn. 6 months & 5 years	Kanem	Berton and Lacsala (1996)
Nov. 1994	7.9	Btwn. 6 months & 5 years	Kanem	Brunet (1994)
May, 1994	17.6	Btwn. 6 months & 5 years	Kanem	Bouvier (1994)

[1] Weight/height <80% of the mean of the reference popularion

Annex A Table 6
Child Mortality by Region
(Per thousand)
Mortality Quotient

Prefecture	Infantile (up to 1 year)	Juvenile (between 1 and 5 years)	Infantile and Juvenile (up to 5 years)
Sahara	**93**	**65**	**151**
BET[1]	101	72	165
Biltine	85	57	137
Sahel	**116**	**88**	**193**
Batha	109	81	181
Chari-Baguirmi	103	75	170
Guéra	137	109	231
Kanem	108	81	182
Lac	113	85	188
Ouaddaï	116	88	194
Salamat	123	96	207
Sudan	**149**	**120**	**252**
Logone Occidental	149	121	252
Logone Oriental	143	115	242
Mayo-Kebbi	149	121	252
Moyen-Chari	136	105	230
Tandjilé	169	140	185

[1] BET: Borkou-Ennedit-Tibesti
Source: 1993 Census

Annex A Table 7

Ten Most Frequent Health Problems

(percent of new cases in 1994 at health centers)

Health problems	percent of new cases
1. Fever	13.9
2. Cough <15 days	13.2
3. Muscular and articular pain/headaches	9.4
4. Diarrhea	8.2
5. Traumas	6.2
6. Skin infection	5.2
7. Conjunctivitis	4.8
8. Dysentery	4.0
9. Ear infection/chest infection	3.8
10. Urinary infection	3.4

Source: *Annuaires de Statistiques sanitaires du Tchad, Année 1995*

Annex A Table 8

Vaccination Coverage Rates 1992-1993[1]

(Percent of population)

	BCG	**DPT 3**	**Measles**	**Polio 3**	**Tetanus 2**
Cameroon	41	33	33	33	7
CAR	85	45	45	45	48
Chad	34	10	25	13	6
Niger	30	18	18	18	43

[1] Data for Chad in 1992, other country data are for 1993

Source: World Health Organization

Annex A Table 9

Annual Farm Revenue by Crop and Production System in the Soudan, 1994/95

Cotton Yields	Crop Mix	Farmers Producing Cotton Using Animal Traction	Farmers Producing Cotton without Animal Traction	Farmers who Neither Produce Cotton nor Use Animal Traction
Lower than average	cotton	CFAF 40,000 - 50,000 ($ 80 - 100)	CFAF 30,000 - 40,000 ($60 - 80)	
	Peanuts + cereals + other food crops	CFAF 12,000 - 21,000 ($24 - 42)	CFAF 0 - 7,000 ($ 0 - 14)	CFAF 0 - 18,000 ($0 - 36)
Above average	Cotton	CFAF50,000 - 140,000 ($100 - 280)	CFAF 30,000 - 93,000 ($60 - 186)	
	Peanuts + cereals + other food crops	CFAF6,000 - 30,000 ($ 12 - 60)	CFAF 1,500 - 8,000 ($ 3 - 16)	

Source: CIRAD, 1996, Tome 2. For $1 = CFAF 500.

Annex A Table 10

Annual Expenditures by Crop and Production System in the Soudan, 1994/95

Types of Expenditures	Cotton Farmers with Animal Traction	Cotton Farmers w/o Animal Traction	Non-cotton Farmers w/o animal Traction
Household needs	CFAF 35,000- 100,000 ($ 70 - 200)	CFAF 15,000 - 40,000 ($30 - 80)	CFAF 11,000 - 25,000 ($ 22- 50)
Civil and social duties	CFAF 12,000 - 85,000 ($ 24 - 170)	CFAF 6,000 - 57,000 ($12 - 114)	CFAF 1,000 - 5,000 ($2 - 10)
Purchases of cereals	CFAF 3,000 - 14,000 ($6 - 28)	CFAF 2,000 - 10,000 ($ 4 -20)	CFAF 500 - 22,000 ($1 - 44)

Source: Rougier, 1995

Annex A Table 11

AVERAGE INCOME & EXPENSES (francs/inhabitant/year)

REGION	Chari-Baguirmi rural	N'djaména	Logone occ rural	Moundou	Moyen Chari rural	Sarh	Ouaddaï rural	Abéché	GRAND TOTAL TCHAD	*RURAL*	*URBAN*
Total Income	**164 382**	**246 954**	**45 379**	**139 365**	**53 238**	**180 442**	**76 785**	**214 923**	**98 193**	***72 762***	***187 897***
Current income (excl. transfer payments)	**125 987**	**186 156**	**37 452**	**117 020**	**45 394**	**123 050**	**65 333**	**140 914**	**78 992**	***61 348***	***141 228***
Farming income	43 115	2 752	10 012	2 323	21 601	5 444	22 932	16 280	**21 057**	***25 159***	***6 588***
Payroll	1 965	65 787	105	35 277	107	39 993	3 266	30 615	**10 288**	***623***	***44 378***
Non-monetary income	18 904	1 084	19 402	4 428	13 507	3 267	24 898	11 505	***15 385***	***18 268***	***5 215***
Property income	3 941	23 583	1 313	8 322	38	25 615	1 451	7 062	***4 430***	***1 111***	***16 137***
Informal sector income	58 063	92 949	6 619	66 671	10 141	48 729	12 786	75 453	**27 832**	***16 186***	***68 910***
Transfer payments received (excl. loans)	**30 530**	**51 471**	**7 928**	**15 390**	**2 776**	**29 861**	**8 570**	**60 717**	**14 886**	***8 694***	***36 728***
Loans	**7 864**	**9 326**	**0**	**6 956**	**5 069**	**27 532**	**2 882**	**13 292**	**4 315**	***2 720***	***9 941***
Total expenses	**116 603**	**240 121**	**73 567**	**142 632**	**67 767**	**147 178**	**90 588**	**167 573**	**98 670**	***75 662***	***179 825***
Current expenses (excl. transfer payments)	**99 209**	**220 909**	**67 099**	**134 425**	**62 774**	**128 538**	**86 919**	**162 011**	**91 184**	***69 902***	***166 254***
Foodstufs	57 991	111 555	45 690	73 228	46 563	63 691	63 250	101 377	**58 297**	***49 402***	***89 673***
Non-food*	41 218	109 354	21 408	61 197	16 211	64 847	23 669	60 634	**32 887**	***20 500***	***76 581***
School related	354	3 895	729	1 695	427	1 335	275	1 165	**810**	***358***	***2 401***
Equipment	5 738	6 387	2 806	4 420	1 629	5 269	1 973	5 302	**2 956**	***2 343***	***5 121***
Other annual expenses	679	5 888	374	3 617	483	4 288	476	1 668	**1 216**	***411***	***4 052***
Clothing	15 255	21 169	5 740	12 934	5 092	13 108	8 388	19 909	**9 120**	***7 109***	***16 216***
Building materials	2 507	9 469	3 236	9 105	1 207	7 699	523	7 031	**2 634**	***1 242***	***7 547***
Sports	133	384	5	49	0	103	52	591	**81**	***31***	***256***
Health	6 122	14 927	2 682	6 601	2 234	8 584	3 000	2 356	**4 323**	***2 834***	***9 576***
Hygiene	5 461	14 604	2 073	8 521	1 867	8 271	6 719	15 387	**5 312**	***3 649***	***11 178***
Housing	98	10 888	0	3 399	25	4 324	0	2 346	**1 425**	***16***	***6 393***
Transport	3 788	15 130	3 123	7 520	2 104	6 773	2 211	3 956	**3 706**	***2 030***	***9 617***
Recreation & Miscellaneous	1 082	6 614	640	3 336	1 142	5 092	53	924	**1 304**	***476***	***4 224***
Transfer payments made (excl. loans)	**9 863**	**12 491**	**1 734**	**5 574**	**2 021**	**8 138**	**3 271**	**5 042**	**4 506**	**3 347**	**8 593**
Loans & reimbursements	**7 532**	**6 722**	**4 734**	**2 633**	**2 972**	**10 503**	**398**	**520**	**2 980**	**2 413**	**4 978**
Savings	**47 446**	**4 228**	**- 23 453**	**- 7 590**	**- 16 625**	**16 234**	**-16 287**	**34 578**	**- 1 812**	***- 3 207***	***3 109***
Savings (excl. transfer payments)	***26 778***	***- 34 753***	***- 29 647***	***-17 405***	***- 17 380***	***- 5 488***	***-21 586***	***-21 096***	***-12 192***	***- 8 554***	***- 25 026***

*(*Incl. building costs & taxes)*

Annex A Table 12

AVERAGE INCOME

In francs/year/inhabitant

REGION	Chari-Baguirmi rural	N'djaména	Logone occ rural	Moundou	Moyen Chari rural	Sarh	Ouaddaï rural	Abéché	GRAND TOTAL TCHAD	*RURAL*	*URBAN*
Cotton	0	0	5 622	315	11 276	1 301	290	0	**3 617**	***4 414***	***804***
Sugar cane	0	0	232	45	1	4	112	11	**64**	***78***	***17***
Tobacco	0	0	52	0	154	0	0	0	**43**	***54***	***7***
Gum arabic	866	50	0	0	0	0	0	100	**196**	***235***	***61***
Other crops (hibiscus)	61	19	0	0	89	0	0	0	**35**	***41***	***14***
Millet	8 634	860	110	85	1 216	589	9 372	9 251	**4 165**	***4 871***	***1 675***
Maize	797	291	79	82	526	169	123	22	**366**	***406***	***224***
Sorghum	6 495	299	122	65	938	359	1 820	649	**2 046**	***2 467***	***562***
Wheat	0	90	0	56	0	10	0	6	**11**	***0***	***50***
Rice	829	78	543	70	19	321	0	74	**304**	***351***	***140***
Citrus fruits	0	55	66	31	0	8	5	0	**19**	***16***	***32***
Tubers	1 538	5	91	116	934	196	227	128	**613**	***746***	***146***
Vegetables	691	159	43	68	42	265	375	357	**271**	***295***	***183***
Groundnuts	11 951	86	2 053	481	4 268	676	7 605	2 343	**5 431**	***6 630***	***1 203***
Other crops	2 544	149	185	162	326	33	1 247	413	**923**	***1 109***	***268***
Stockraising income	535	358	634	7	364	827	486	2 306	**494**	***499***	***476***
Fishery	7 622	138	44	608	1 155	642	0	0	**1 982**	***2 392***	***533***
Other agricultural income	550	116	137	132	293	45	1 272	620	**475**	***555***	***191***
Public sector payroll (incl. public enterprises)	0	36 295	0	24 839	0	20 078	3 266	19 696	**5 830**	***309***	***25 307***
Payroll of private enterprises (incl. informal sector)	1 965	29 491	105	10 438	107	19 915	0	10 919	**4 458**	***315***	***19 071***
Rent received	1 289	11 980	0	2 342	38	4 481	1 451	4 956	**2 107**	***668***	***7 184***
Aid from village	2 309	6 146	2 053	2 182	917	1 916	908	3 028	**1 783**	***1 176***	***3 921***
Aid for mourning	2 660	3 161	4 313	1 407	650	3 592	928	2 659	**1 549**	***1 269***	***2 539***
Aid for marriage	7 948	1 775	580	466	4	460	592	2 244	**1 302**	***1 321***	***1 236***
Aid for birth	1 762	1 968	183	517	3	598	296	1 879	**570**	***358***	***1 319***
Aid for pilgrimage	499	800	0	95	4	310	345	316	**259**	***195***	***487***
Other grants/gifts received	2 254	24 838	798	7 579	946	12 932	2 457	20 454	**4 972**	***1 567***	***16 982***
Transfer payments from polygamous husband	0	3 647	0	1 061	0	2 886	345	20 050	**797**	***33***	***3 495***
Other transfer payments received (pension, scholarship, insurance, etc.)	13 097	9 136	0	2 082	252	7 168	2 699	10 086	**3 653**	***2 776***	***6 749***
Loans	5 319	7 184	0	5 508	1 637	20 971	2 882	4 955	**3 167**	***1 970***	***7 390***
Loan recoveries	2 545	2 143	0	1 448	3 432	6 561	0	8 337	**1 148**	***750***	***2 551***
Net profit on *pari-vente (azouma...)*	0	1 058	289	214	0	178	0	2 107	**176**	***20***	***730***
Other income (annuities, sale of securities, proceeds of off-track betting, lottery winnings, etc.	2 652	10 545	1 025	5 766	0	20 956	0	0	**2 146**	***423***	***8 224***
									0	***0***	***0***
Owner-operator business income	58 063	92 949	6 619	66 671	10 141	48 729	12 786	75 453	**27 832**	***16 186***	***68 910***

Annex A Table 13
AVERAGE HOUSEHOLD INCOME BY QUINTILE
(per increasing expenditure quintile, from poor to rich)

REGION	Chari-Baguirmi rural	N'djaména	Logone occ rural	Moundou	Moyen Chari rural	Sarh	Ouaddaï rural	Abéché	GRAND TOTAL TCHAD	*RURAL*	*URBAN*
TOTAL INCOME (francs/year/inhabitant)											
First quintile	74 549	134 910	29 794	63 807	31 574	56 201	34 646	101 319	**67 513**	***45 779***	***111 473***
Second quintile	134 653	150 634	35 605	75 342	46 566	87 614	56 006	127 011	**93 313**	***75 266***	***129 813***
Third quintile	103 039	183 796	44 049	125 096	47 221	132 174	50 559	219 528	**100 374**	***65 420***	***171 071***
Fourth quintile	185 251	316 408	59 427	175 016	57 331	275 010	122 331	281 395	**171 925**	***113 617***	***289 861***
Fifth quintile	353 353	588 435	75 728	319 459	101 743	521 045	170 624	560 600	**3 090 372**	***194 125***	***542 474***

Annex A Table 14
AVERAGE HOUSEHOLD EXPENSES BY QUINTILE
per increasing expenditure quintile, from poor to rich

REGION	Chari-Baguirmi rural	N'djaména	Logone occ rural	Moundou	Moyen Chari rural	Sarh	Ouaddaï rural	Abéché	GRAND TOTAL TCHAD	*RURAL*	*URBAN*
TOTAL EXPENSES (francs/year/inhabitant)											
First quintile	49 124	93 153	36 784	54 465	31 325	46 138	52 213	84 724	**55 189**	***42 694***	***80 462***
Second quintile	80 498	151 340	53 521	83 483	41 008	80 550	72 335	124 520	**85 092**	***62 880***	***130 018***
Third quintile	97 701	210 599	66 930	115 575	55 186	113 844	86 930	164 294	**111 904**	***78 000***	***180 478***
Fourth quintile	143 224	308 814	87 166	168 248	75 399	183 489	118 194	219 773	**160 702**	***108 875***	***265 529***
Fifth quintile	247 790	586 139	140 463	359 701	155 250	451 897	171 098	401 079	**297 924**	***186 218***	***523 862***

Annex A Table 15
POVERTY THRESHOLD

REGION	Chari-Baguirmi rural	N'djaména	Logone occ rural	Moundou	Moyen Chari rural	Sarh	Ouaddaï rural	Abéché	SAMPLE TOTAL	*RURAL*	*URBAN*
FOOD POVERTY THRESHOLD											
NUMBER OF PERSONS											
Under	429	3 210	801	1 582	630	1 971	425	809	**9 857**	*2 285*	*7 572*
Over	304	1 787	342	939	323	450	183	1 196	**5 524**	*1 152*	*4 372*
Percentage	58.5	64.2	70.1	62.8	66.1	81.4	69.9	40.3	**61.4**	*66.5*	*63.4*
NON-FOOD POVERTY THRESHOLD											
NUMBER OF PERSONS											
Under	219	1 027	454	633	361	640	180	272	**3 786**	*1 214*	*2 572*
Over	514	3 970	689	1 888	592	1 781	428	1 733	**11 595**	*2 223*	*9 372*
Percentage	29.9	20.6	39.7	25.1	37.9	26.4	29.6	13.6	**24.6**	*35.3*	*21.5*
GLOBAL POVERTY THRESHOLD											
NUMBER OF PERSONS											
Under	275	1 748	640	996	479	1 406	308	404	**6 256**	*1 702*	*4 554*
Over	458	3 249	503	1 525	474	1 015	300	1 601	**9 125**	*1 735*	*7 390*
Percentage	37.5	35.0	56.0	39.5	50.3	58.1	50.7	20.1	**40.7**	*49.5*	*38.1*

Annex A Table 16

Estimates of Crop Production and Yields in the Sahel and Soudan Zones, 1995-96

	SAHEL ZONE			SOUDAN ZONE					
Crops	Area (ha)	Yield	Production (mt)	Area (ha)	Yield	Production (mt)	Area	Yield (kg/ha)	Production (mt)
Millet	465,248	305	141,901	174,589	581	101,436	639,837	356	227,782
Sorghum	265,750	565	150,149	409,465	702	287,444	675,215	648	243,337
Maize	27,220	1,208	32,882	43,593	688	29,992	70,813	888	62,882
Rice	315	1,695	534	59,318	1,322	78,418	59,633	1,324	78,954
Berbere	66,300	948	62,852	34,365	1,014	34,846	100,665	971	97,746
Wheat	1,897	1,393	2,643	0	0	0	1,829	1,393	2,643
Fonio	0	0	0	708	403	285	708	403	285
Peanuts	103,857	953	98,976	214,816	959	206,009	318,673	957	304,907
Sesame	29,607	213	6,306	15,833	262	4,148	45,440	230	10,451
Cowpeas	23,171	362	8,388	20,729	608	12,601	43,897	478	20,983
Vouandzou	0	0	0	22,789	849	19,348	22,789	849	19,348
Gombo	8,787	9,849	86,543	0	0	0	8,787	9,849	86,943
Tomato	6,900	12,383	85,443	0	0	0	6,900	12,383	85,443
Manioc	10,504	14,135	148,474	8,033	14,847	119,266	18,538	14,443	267,730
Taro	0	0	0	4,436	1,899	8,424	4,436	1,899	8,424
Sweet Potato	22,425	25,675	575,762	0	0	0	22, 425	25,675	575,762

Source: Direction de la Statistique Agricole, Enquete Agricole Permanente Campagne 1995-96.

Annex A Table 17
Livestock Population, 1995

Regions	Cattle	Sheep	Goats	Horses	Donkeys	Camels	Pigs
Sahel	3,900,041	1,416,105	3,357,741	165,981	245,325	525,591	1,481
Sudan	846,350	504,814	445,911	29,853	13,006	0	16,170
BET[1]	0	302	417	396	0	81,844	0
Total	**4,746,391**	**2,221,221**	**3,804,069**	**196,230**	**258,331**	**607,435**	**17,651**

1; BET: Borkou-Ennedit-Tibesti
Source: Direction Nationale de l'Elevage, 1996

Annex A Table 18
Gum Arabic: Estimated Farmagate - F.O.B. Price Spread, 1996

Items	CFA/Kg	%Spread	%f.o.b.
F.O.B	600	143.53	100
Farmgate price	181.96	43.53	30.33
Bag+Handling	27.66	6.62	4.61
Transport[1]	41.02	9.81	6.84
Other[2]	28.73	6.87	4.79
Operating Margin	174.08	41.64	29.01
Price Spread	418.04	100.00	69.67

1 Transport includes passenger's fare
2. Other costs include transit fees and sanitary inspection
3 Price spread is f.o.b. N'Djaména less farmgate price
Source: SCLC, rapid appraisal, December 1996

Annex A Table 19 - Panel A
First Priority Road Network

Road	Km	Type	Used	Maintenance
Walia-Ngueli	6	Asphalt	All year	Routine
Voie de contournement	20.5	Asphalt	All year	Routine
N'Djamena-Djermaya	26.5	Asphalt	All year	Routine
Djermaya - Massaguet	45.5	Earth	All year*	Routine
Djermaya - Dandi	66	Asphalt	All year*	Routine
Massaguet - Massakory	68	Earth	All year*	Periodic
Massaguyet - NGoura	124	Earth	All year*	Periodic
N'Goura - Bokoro	104	Earth	All year*	Periodic
Bokoro - Mongo	201	Laterite	All year*	Periodic
Mongo - Mangalme	122	Earth	10 months	Periodic
Mangalme - Oum Hadjer	109	Earth	10 months	Periodic
Oum Hadjer - Abeche	146	Earth	9 months	Routine
Abeche - Adre - Border	174	Earth	10 months	Routine
N'Djamena - Guelengdeng	144	Asphalt	All year*	Routine
Guelengdeng - Bongor - Koyom	160	Earth	8 months	Routine
Koyom - Ere - Kelo	58	Earth	8 months	Routine
Guenlendeng - Sarh	402.5	Earth	All year*	Routine
Sarh - Mondou - Lere	603	Laterite	All year*	Periodic
Sarh - Maro - Sido	125.5	Laterite	All year*	Routine
Massakora - Bol Bagasola	237.5	Earth	4-whell only	Routine
Abeche - Biltine	92	Earth	All year*	Routine
Mongo - Ati	154	Earth	9-10 months	Periodic
Mbalkoro - Bedaoyo	112.5	Laterite	All year*	Periodic
Moundou - Boarobou	115	Earth Trail	For carts	None
Mongo - Abou Deia	122.5	Laterite in Progress	All year*	Periodic
Abou Deia - Am Timam	135	Laterite in Progress	All year*	Periodic
Doba - Gore	95	Laterite	All year*	Periodic
Total	**3,768.5**			

Annex A Table 19 - Panel B
Second Priority Road Network

Road	Length (km)	Type	Used	Maintenance
N'Djamena - Linia - Dourbali	103	Earth	All year*	Routine
Bitkine - Melfi	118	Latrerite in progress	All year*	routine
Bokoro - N'Gama	75	Earth	All year	Routine
Sarh - Kyabe	98	Earth	10 months	Routine
Kelo - Lai	60	Earth	8 months	Routine
Koumra - Moissaia	74	Earth	All year*	Routine
Koyom - Lai	68	Earth	8 months	Routine
Pala - Fianga	72	Earth Trail	Dry season only	Routine
Kemdera - Moissala	127	Earth	9 months	Routine
Doba - Lai	104	Earth	10 months	Routine
Total	**899**			

* Subject to rain barriers, with average 2 -3 days waiting period for earth roads and 6 hours for laterite.
Routine maintenance requires scraping road survace and filling holes; periodic maintenance requires the road.
Source: Sociéte Nationale d'Entretien Routier (SNER)

Annex A Table 20
Average Cost of Production of Recommended Practice, 1993-1995
Estimates by
INSAH/PRISAS[1]

Items	CFA/kg	Percent
Inputs	35,432	35.90%
Village transport	1,886	1.91%
Other	61,308	62.10%
Total cost of production	98,626	100.00%
Total revenue	117,369	
Margin	18,742	

[1] INSAH/PRISAS: Institut du Sahel/Programme Régional de Renforcement Institutionnel de la Recherche en Matière de Sécurité Alimentaire au Sahel
Source: Yacoub Abdelwahid and personal communication from farmers

Note: Other costs include labor and service costs of soil preparation, sowing harvesting and sorting. Farmers' estimates are based on yield of 800 kg/ha whereas PRISAS estimates give an average yield of 1,028 kg/ha.

Annex A Table 21
EVOLUTION OF THE HEALTH BUDGET
(in thousands of F CFA)

YEARS	GOVT. BUDGET	HEALTH BUDGET			COMMITTED HEALTH EXPENSES			COMMITTED	percent HEALTH	percent HEALTH	percent	percent
		PERSONNEL	OPERATIONS.	TOTAL	PERSONNEL	OPERATIONS	TOTAL	GOVT. EXPENSES	BUDGET/ GOVT. BUD GET	EXPENSES/ GOVT./BUDGET	PERSONNEL EXPENSES MOPH	OPERATING EXPENSES MOPH
1986	42.550.420	967.592	304.600	1.272.192	967.592	85.000	1.052.592	27.711.000	3,0	3,8	91,9	8,1
1987	25.400.607	671.370	122.248	739.618	617.370	90.435	707.805	24.768.000	2,9	2,9	87,2	12,8
1988	27.113.772	701.264	181.836	883.100	701.264	90.935	792.199	30.972.000	3,9	2,5	88,5	11,5
1989	39.153.626	1.289.671	334.765	1.624.436	1.128.182	152.117	1.280.299	42.235.000	4,2	3,0	88,1	11,9
1990	40.107.000	1.195.093	524.621	1.719.714	1.139.280	396.481	1.534.761	39.709.000	4,3	3,8	74,2	25,8
1991	40.925.878	1.456.874	622.751	2.079.625	1.557.460	622.751	2.180.211	39.807.000	5,1	5,3	71,4	28,6
1992	43.692.000	1.842.235	794.100	2.636.335	1.322.680	506.389	1.829.069	28.294.746	6,0	4,2	72,3	27,7
1993	41.214.301	2.250.831	955.759	3.206.590	1.808.551	606.566	2.415.117	39.027.500	7,7	5,8	74,8	25,1
1994	70.864.889	2.059.101	1.200.000	3.259.101	1.289.639	859.096	2.148.735	41.709.533	4,6	3,3	60,0	40,0
1995	61.652.000	2.062.951	1.698.565	3.761.516	1.739.920	938.474	2.678.394	52.642.886	6,1	4,3	65,0	35,0
1996	56.423.000	2.163.216	2.053.432	4.216.678	2.179.389	1.983565	4.152.954	n.a	7,5	7.4	52.4	47.6

Source: Ministère de la Santé publique, Division des Ressources financières, May 1997

ANNEX B

STATISTICAL SYSTEMS AND POVERTY MONITORING IN CHAD

A. THE PRESENT STATISTICAL SYSTEM

In Chad the use of statistics is under developed and demand from Chadian users is weak. Because of its unsettled political past, much of the statistical capacity which had been developed was destroyed. Despite a serious commitment to rebuilding such capabilities, investment in building up the managerial and technical skills of the government and the public sector has been limited because of the massive size of the task and the limited availability of resources. This includes training in the interpretation and use of the statistical data for improving decision-making. The university and academic community in Chad is very small and demand from that quarter is consequently insignificant. The same may be said for potential users in the private sector. As a result there has been little drive from Chadian users to improve the quality and the responsiveness of the national statistical service. Users in government have had to "make do" with scanty information and to rely on anecdotal rather than statistically valid information. The lack of adequate data for planning and monitoring economic performance has, nevertheless, been recognized by the Chadian government as a serious constraint, but it is understandable that in times of economic cutbacks, statistical services have still only a weak claim for scarce resources.

The statistical system in Chad has developed in a modular fashion. At the heart of the system is the *Direction de la Statistique, des Etudes Economiques et Demographiques* (*DSEED*). There are actually 18 public sector institutions involved in statistical data collection. Some of these are responsible for only a small part of the system (such as the *Caisse autonome d'amortissement* for debt monitoring), others such as the *Direction des Statistiques Agricoles* (*DSA*) or the *BEAC* have sizable responsibilities and indeed their resources and capacity to collect, process and analyze data is, in some cases, stronger than it is in *DSEED*. Would the appropriate long term strategy be to encourage a greater degree of centralization or to continue with the modular approach? Decentralization can refer to the idea of having statistical activities handled by a number of different sectoral agencies (as is case at present). Alternatively, it can refer to the decentralization of services and activities to the provincial or prefectural levels. One strategy would be to follow a modular route and also to build up prefectural capabilities over time, but at the same time to emphasize strong coordination and leadership from the *DSEED*.

B. INTRODUCING THE POVERTY MONITORING AND ANALYSIS SYSTEM

An in-depth understanding of the nature, extent, and determinants of poverty is necessary to ensure that policies and programs aimed at alleviating poverty and improving household welfare are well designed. Monitoring the impact of interventions on the poor over time is a necessary investment to be sure that programs reach their intended beneficiaries and that scarce resources are used cost effectively. In addition, monitoring increases transparency of resource allocation and policy beneficiaries, which are prerequisites to accountability and governance. The key objective of a Poverty Monitoring and Analysis System (PMAS) is to inform decision

makers of the impact of policies and programs on the poor and to respond to specific policy makers' requests regarding the design of future policies and programs.

In Chad, the objectives of a PMAS would be to: (i) monitor the level and trend of poverty in Chad to evaluate overall progress; (ii) characterize and analyze poverty by region, gender, income source, employment, socio-economic group, consumption pattern, and other socio-economic variables; (iii) forecast the impact of macroeconomic policies and the petroleum boom to design targeted programs; (iv) assess the access of the poor to social services (health centers, schools), to targeted programs (school feeding, food aid), and to economic infrastructure (credit, agriculture extension services), and to analyze the determinants of access in order to improve policy and program design and public resource allocation; (v) analyze and monitor over time the poor's own assessment of their situation and to incorporate their perceptions into policy design and ensure their understanding of the policies that affect them; and (vi) to report promptly on a food crisis in order to take action to avoid food insecurity or famine.

To reach these objectives, conducting nationally representative, it would be necessary to conduct large-scale income and expenditure household surveys. The information gathered by these surveys should be complemented by: (i) ad-hoc and on-purpose survey data like the ones conducted within the framework of the *Système d'Alerte Précoce*; (ii) by information on the supply of services given by administrative records on health, education, and agriculture extension; and (iii) by qualitative assessments, such as participatory poverty assessments. It is also critical that poverty be analyzed over time and that time-series be built, so that a multi-year survey program must be supported. The implementation of each type of information gathering process would include data collection, data processing, and analysis and use of the results.

C. PROPOSAL

To foster a broad-based dialogue on poverty and to continue analytical work, it is critical to institutionalize an annual review of poverty levels and trends in Chad and of the government's poverty reduction strategy. The review would also monitor progress in meeting targets and objectives. These tasks could be performed either by an existing unit which would need to be strengthened, or by a unit established for this purpose. The main tasks of the unit would be the production of the Annual Report and the wide dissemination of the finding. To this end, the unit would: (i) assess policymakers' and poverty analysis users' needs for studies and qualitative and quantitative information; (ii) design and review the data collection programs to meet the needs of policy makers, taking into account existing information; (iii) design and manage the study program by using the analytical capacities of the country; (iv) organize an annual workshop in which data producers and users would present and review the report; (v) prepare a synthesis of results relevant to policy makers in defining poverty reduction measures; and (v) disseminate the Annual Report, including a presentation to the National Assembly, through the various media.

IMAGING

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