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working group on
recurrent costs

recurrent costs of development programs in the countries of the sahel

analysis and recommendations

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CILSS

COMITE PERMANENT INTER-ETATS DE LUTTE
CONTRE LA SECHERESSE DANS LE SAHEL

CLUB DU SAHEL

Working Group on
Recurrent Costs

RECURRENT COSTS OF DEVELOPMENT PROGRAMS IN THE COUNTRIES OF THE SAHEL: ANALYSIS AND RECOMMENDATIONS

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"The problems of developing countries do not call for sophisticated forecasts, but rather common sense, reflection, and sometimes courage" (a Malian official)

INTRODUCTION

Mention of the recurrent cost problem inevitably evokes visions of dilapidated schools, hospitals without drugs, abandoned irrigation ditches, impassable roads, new tractors immobilized in the fields, etc., all due to an insufficience of human and material inputs required for the operation and maintenance of infrastructure and institutions.

This spectacle does exist, in varying degrees, in the Sahel as elsewhere. It can even be found in developed countries, but in the social cost of deterioration of the stock of the physical and institutional capital is less there, given the relative abundance of these factors.

If it is heard, an appeal for increased material and human resources, whether local or foreign, can, in general, improve the situation in the short, even medium run. Nevertheless, given its recurrent nature, the problem will inevitably reappear, and all the more rapidly the more limited the possibility of increasing resources to meet operating and maintenance requirements of an investment program in a state of continuous expansion.

Thus, the search for a longer-term solution to the recurrent cost problem calls for addressing a set of difficult questions going beyond a simple comparison of needs and resources; for example, what impact does deterioration of infrastructure have on the performance of the productive activities supported by it? What benefit does a government obtain from allowing certain assets to deteriorate in order to allocate funds saved thereby to other objectives? Is it in these countries' interest for the government to take responsibility for a substantial part, if not 100%, of the operation and maintenance of investments in certain sectors as opposed to others? Do the categories and vehicles of capital assistance provided by the rich countries to those less fortunate contain the seeds of a recurrent cost problem that can be expected to come out into the open the day after the donors withdraw?

The Working Group on Recurrent Costs, established in 1978 under the aegis of the Permanent Inter-State Committee for the Struggle against Drought in the Sahel (CILSS) and of the Club du Sahel, has endeavored to reply to these along with other kinds of questions in the course of an investigation that has led it to study close to thirty development projects in eight different socio-economic sectors within the Sudano-Sahelian region, as well as to examine the budgets of seven governments belonging to this region.

The present document is the final report of the Working Group. Part One contains a detailed review of the objectives of the study as well as general and operational definitions of recurrent costs or expenditures and related concepts. Part Two, devoted to the results of the project and sectoral analysis, considers not only sectoral characteristics of recurrent costs, but also ways and means by which a government can recover certain of these costs. Broadening the framework of the analysis, Part Three considers

how the financing of recurrent costs may compete with other obligations facing the governments of the region. This part also presents medium-term projections of the Sahelian governments' fiscal deficits, on the assumption that operation and maintenance of existing and future projects will be supported at an adequate level. Part Three concludes with an examination of the constraints which explain the downward rigidity of public expenditures as well as the upward stickiness of government receipts. Part Four establishes a critical inventory of sectoral and macro measures by which the governments of the Sahel and the international finance agencies might be able to improve the present and future situation. Part Five concludes the report with a set of recommendations.

Membership of the Working Group on Recurrent Costs, which carried out its assignment between 1978 and 1980, comprised the following:

1. National delegates to the study from the Sahelian countries (members of the CILSS).
2. Representatives of the CILSS and Club du Sahel secretariats;
3. Regular and contract staff of the CILSS;
4. Experts assigned by certain donor countries;
5. Permanent and contract staff of the Harvard Institute for International Development (H.I.I.D.) and the Centre de recherche en développement économique of the University of Montreal (C.R.D.E.).

The consultant services provided by H.I.I.D. and C.R.D.E. were financed by the United States Agency for International Development and the Canadian International Development Agency, respectively. The French, Dutch, and Swiss governments contributed to the Working Group via payment of consultants' salaries or assignment of experts. Finally, the Sahelian countries contributed

to realizing the objectives of the study by assigning government officials to participate in it.

The Working Group expresses its sincere gratitude to the Club du Sahel and CILSS secretariats, as well as the Sahelian governments and international finance agencies, for all information which they have communicated to it, as well as for the material and intellectual support they have provided at all times. Nevertheless, the analyses and opinions presented below reflect the views of the majority of the Working Group and are not necessarily shared by the governments of the Sahelian countries or the international finance agencies by whom some members are employed.

Notwithstanding all the efforts undertaken in support of the Working Group, the following report remains a semi-finished product, inasmuch as the answers it presents have given rise to additional questions to which the lack of reliable data and our general lack of knowledge about the development process have not permitted us to provide definitive answers. In any case we have always attempted to state clearly the fact and causes of our ignorance or uncertainties, in the hope that, in the not-too-far distant future, other observers, better informed or more far-sighted, will be able to finish the product submitted herewith.

SAHELIAN CURRENCY EXCHANGE RATES

Exchange rates: number of currency units per $US
(as of December 31, 1979)

Country	Currency	
Chad	franc CFA (F.CFA)	201
Cape Verde Islands	escudo (ECV)	38.3
The Gambia	dalasi (D)	1.799
Mali	Malian franc	402
Mauritania	ouguiya (UM)	45.9
Niger Senegal Upper Volta	franc CFA(F.CFA)	201

Note: Exchange rates used in this report differ from the above insofar as they apply to points in time other than Dec. 31, 1979, or represent averages over periods of time.

EXECUTIVE SUMMARY

1. Shortly after its creation in 1976, the Club du Sahel took cognizance of the pressures that were being experienced by the budgets of the different CILSS-member governments (Cape Verde, Chad, The Gambia, Mali, Mauritania, Niger, Senegal, Upper Volta). It was concerned in particular with the tensions which might arise from insufficient local financing of operation and maintenance costs (recurrent costs) of projects established within the framework of the First Generation Program (1978-82) at a time when the donors would have fulfilled their commitments and would be moving towards financing other activities in the Sahel or elsewhere. The third conference of the CILSS and Club du Sahel (Amsterdam, 1978) entrusted to a working group (Working Group on Recurrent Costs) composed of representatives of the Sahelian governments, international aid agencies, Sahelian and non-Sahelian experts and representatives of the CILSS and the Club, the task of carrying out a detailed study of the recurrent costs of development programs in the Sahel. The conference specified that the analysis should be carried out on both the macroeconomic level -- the fiscal balance of the governments in question -- and on a microeconomic level, i.e. at the level of development projects.

From 1978 to 1980, in accordance with its mandate, the Working Group studied 29 development projects in the Sahel established in eight socio-economic sectors -- agriculture, rural water supply, livestock, fisheries, forests, transport infrastructure, education and health -- as well as the budgets of 7 of the area's 8 governments (due to political developments it was not possible to include a country study of Chad). The Working Group met on four occasions in Ouagadougou to review the progress of the study(January, May and November 1979) and to debate, modify and approve a draft final report (June 1980). In February, 1980, the Working Group organized a "consultation itinérante"whereby three of its members met successively with officials in six Sahelian countries to, on the one hand, receive their criticisms and comments on the technical studies and, on the other hand, examine with responsible Sahelian officials certain recommendations concerning internal government policies subject to possible inclusion in the final report. In late March, 1980, representatives of the bilateral and multilateral aid agencies involved in the Sahel met at the University of Montreal to study alternative recommendations that might be reproduced in the final report.

The present document is the final report of the Working Group (Chapter I).

2. The Working Group proposes to define recurrent costs or expenditures as "the set of annual flows of gross expenditure of the government and its agencies, in local currency or foreign exchange, undertaken in order to generate socio-economic benefits in connection with the operation and maintenance of a unit of installed capacity, regardless of the source of finance of the expenditures in question, domestic or foreign." (Chapter II).

A key point of difference with other explicit or implicit definitions of recurrent costs -- for example, that of the Development Assistance Committee of the Organization for Economic Cooperation and Development -- is the emphasis placed by the Working Group on the condition that the productive capacity in question must be properly installed and have reached its phase of normal operation before expenditures associated with it are to be considered recurrent. All expenditures incurred prior to that point, whether on physical or institutional capital or on trial operation and maintenance of that capital, are defined as non-recurrent or development expenditure.

The report also defines two other concepts: a recurrent cost coefficient, being the average annual stream of recurrent expenditure divided by the sum total of non-recurrent expenditure incurred in establishing the capacity in question (all in constant prices), potentially useful in projecting costs of similar projects in the future; and cost recovery covering all mechanisms by which a project generates additional public sector revenue, directly or indirectly.

The report distinguishes between the annual stream of recurrent expenditure called for in a project's original design and the stream that may be considered "optimal" at any subsequent point in time. The CILSS/Club mandate to the Working Group implies concern initially with possible failure of projects to be operated and maintained at their design level of capacity, but consistent with the broader mission of both organizations the Working Group concerned itself with how to ensure that projects would

be operated and maintained so as to maximize the total benefit obtained from all future uses of resources, including government revenues as well as foreign aid. The report identifies examples where optimality requires that installed capacity be operated and maintained either below or above its design capacity, or in a form different from that specified in the design.

With respect to optimality in cost recovery the report distinguishes production of private benefits and "public goods" in development projects. In principle, except in the case of the poorest of the poor, the national budget should be spared the burden of marginal costs of producing private benefits, which should be recovered directly or indirectly by the respective projects.

3. In its study of development projects and sectors the Working Group sought evidence concerning design levels of operation and maintenance expenditure and cost recovery; for those projects already in operation it prepared estimates of actual recurrent expenditure and cost recovery; and finally, where possible, it distinguished design and actual from optimal levels of expenditure and recovery, and sought to explain resulting discrepancies. Principal findings in the eight sector studies are:

i. agriculture (13 projects) -- the process of establishing projects and bringing them up to a point of normal operation, for which attainment of cost recovery targets is a useful indicator, is taking much longer than envisaged in project design. Due to unrealistically short planning horizons and aid commitment periods, projects are expected to attain normal operation within 5 years or less, when in fact such a time period is insufficient to carry them beyond an experimental or development phase during which they seek technologies that are viable from the agronomic, socio-economic and administrative viewpoints. Impeding cost recovery in many cases is the fact that projects are launched on a larger scale, aiming at a greater target population, than is yet justified by the level of technological understanding. Another major obstacle is a widespread policy of depressing food prices in the interest of urban consumers.

ii. rural water supply (borehole development program in one country) --

high expectations of improving rural life by providing water at the central government's expense are being compromised by budget stringency. It appears the program will not be viable in benefitting those communities that are unable to play a substantial role in operation and maintenance, which involves recovering a significant proportion of costs through user charges. This should begin with households and enterprises served by direct connections.

iii. livestock (3 projects, sector and animal health subsector surveys) -- range development projects are subject to similar observations as apply in the case of agriculture. In the animal health subsector, herdsmen appreciate the private benefits of vaccination and are willing to pay marginal costs. Failure to take advantage of their readiness by implementing adequate user charges in some cases is delaying and probably jeapordizing extension of animal health services throughout the region. On the other hand in some cases government policies to depress the price of meat reduce capability for cost recovery. Subsidization is justified in the case of epidemic diseases whose control is a public good as well as private benefit.

iv. fisheries (2 projects) -- the fact that fish prices are not regulated enables projects designed to upgrade fisheries equipment and ensure its maintenance to achieve financial equilibrium. Confusion between directly productive and social activities threatens to impose a charge on the government budget whose recovery is unlikely in the foreseeable future. Imaginative organizational arrangements -- inter alia, on the cooperative model -- could in principle limit the volume of recurrent costs of such projects.

v. forestry (2 projects) -- in the case of forest plantations direct cost recovery is delayed until cutting, although in the meantime environmental protection raises agricultural yields leading to indirect cost recovery. Operation and maintenance cost levels are sensitive to the surrounding population's appreciation of indirect benefits. Cost recovery on cutting is impeded by price control policy.

vi. transport (sector survey emphasizing road transport infrastructure) -- of all sectors in the Sahel, this one presents the clearest case of installed capacity in its normal operating phase deteriorating because of maintenance below design levels. Even where fuel taxes are legally reserved in the form of road funds, part of the proceeds is sometimes diverted to other sectors where the incremental benefit of expenditure is believed to be higher. Uncomfortable at the prospect that the Sahelian countries may be implicitly rescaling their highway networks to a capacity below the design level in order to economize on maintenance expenditure, international aid agencies have come closer to direct recurrent cost financing (via so-called "deferred maintenance") in this than in any other sector.

vii. education (3 projects and a sector survey) -- by tying expansion of physical capacity to that of the teacher population, which in turn is controlled by realistic forecasts of government revenue, the Sahelian countries avoid the "standard" recurrent cost problem of unutilized physical capacity. Where severe restrictions on non-personnel expenditure are aggravated by lack of attention to the necessary institution-building, maintenance of physical infrastructure is below design levels, but because the infrastructure is expanding faster than population and thus predominantly new, a substantial negative impact on educational functions is not evident. On the other hand it is particularly in education that one senses the burden of recurrent budget stringency in slowing the rate of sectoral expansion. With respect to cost controls the report questions the level of student subventions in post-primary institutions. Cost recovery in education is limited by its "public goods" component and the long gestation period of benefits, however the report raises the possibility of establishing a system of fees in post-primary institutions according to family income, as well as that of increased support for primary education via taxation of real property.

viii. health (one national program and 4 projects in primary care subsector)-- public goods are also important in health care, comprising the creation of potential access to health facilities in the case of future need, control of contagion and community satisfaction over alleviation of suffering of individual members. Hence the justification for government subsidization of the sector. However even low-income persons are willing to pay for marginal costs of a substantial volume of palliative treatment leading mainly to private benefits. Failure to institute efficient mechanisms for cost recovery at this level, by delaying program expansion, denies such benefits to other members of society who are willing to pay for them. In some cases injudicious application of foreign aid resources in the sector, by creating excessive dependance on outside intervention, has impeded the attainment of viability.

4. The Working Group undertook to estimate the ex ante fiscal deficit of 7 Sahelian governments for 1982 and 5 of these, excluding Mali and Upper Volta, for 1984. The deficit represents the difference between public sector expenditure commitments on the one hand, and, on the other hand, planned receipts, comprising tax revenues, project loans and grants, and certain lesser items but excluding short-term balancing finance. Estimation of this deficit proceded on the assumption that existing and future projects would be operated and maintained according to design and that the policies of the recipient countries as well as the practices of the international aid agencies would not change in relation to the present situation. The deficit estimated for 1982 is about US$ 180 million.

This deficit will have to be filled somehow, so that resources used equal those available to the public sector. Basically there are two ways of filling the gap, corresponding to the two sides of the fiscal equation: some expenditure commitments may not be met, and/or receipts may be augmented by short-term balancing finance. Most of the Sahelian countries have resorted to both devices in the past; Chapter XI indicates that US$ 165 million of short-term balancing finance was used in 1978; a global estimate of unfulfilled expenditure commitments is not available, although chapters III-IX indicate that it was not negligible.

For the foreseeable future, additional capacity for non-inflationary borrowing on the local market and obtaining short-term foreign aid without excessive political constraints is limited. Thus the report concludes that there are serious grounds to support the fear out of which the CILSS and Club du Sahel commissioned the present study, namely that the brunt of the adjustment is likely to fall on the Sahelian governments' expenditure commitments, and, specifically, to a significant extent on recurrent expenditures of development projects.

The question arises: what policy options are available to reduce the estimated deficit? To lay a basis for answering this question the report examines the principal constraints now in force on the revenue and expenditure sides. On the revenue side, there is little room for manoeuvre to increase the severity of the present tax system. Consequently the constraint on which policy discussion should focus is the slow growth rate of production in the non-state sector, causing the real tax base to expand too slowly to support even minimum expenditure commitments. On the expenditure side, the chief constraints are the governments' obligation to guarantee public sector employment to graduates of the post-primary education system, as well as to finance operating deficits of public enterprises, which make government expenditure commitments rigid on the downside. (Chapters X to XII).

5. The present context of international relations, together with the dangers of excessive external financing, leads to a situation where a solution to the recurrent cost problem depends also, if not primarily, on internal policy measures to be taken by the Sahelian governments themselves. With regard to possible sectoral (microeconomic) measures, the Working Group put forward the following: improvements of the flow of information concerning projects' recurrent budget implications; examination of recurrent implications at the time of project evaluation; uses in project evaluation, of an accounting price greater than 1.0 for uncommitted government revenue; giving greater consideration to uncertainties connected with project evaluation by prolonging the establishment phase, distinguishing the introductory phase from establishment per se and even rescaling certain activities; reconsideration of certain social policies -- free education, primary health care and potable water -- which, due to lack of finance, both restrict maintenance of existing facilities and access of the majority

of the population to new facilities. With regard to global (macroeconomic) measures the Working Group consultants suggest that the principle of the State as primary employer, together with government's tendency to preempt scarce factors, should be reconsidered, while the prevailing attitude of suspicion towards private sector activity should be eliminated. With regard to scarce factors, the report points out that small and medium-scale enterprises lack sufficient access to skilled manpower and capital, the latter having to be rationed on account of the existence of an overly low, indeed negative, real interest rate in the formal capital market, while interest rates in the parallel credit market are prohibitive from the viewpoint of productive investments. (Chapter XIII)

The international aid agencies also have their role to play in the search for a solution to the recurrent cost problem. The Working Group urges donors to persevere in their ongoing efforts to suppress a series of practices which de facto aggravate the recurrent cost problem. These include use of inappropriate technologies (poorly adapted construction standards, excessive intervention in the project operating phase, etc); overlooking the impact of project proliferation in raising local factor prices; lack of attention to project budget analysis; underestimation of the project establishment phase; inability to meet technical requirements of project follow-up; volatility of development strategies. The Working Group also sees a possibility for reallocating part of present aid for establishing projects with more efficient and flexible transfer mechanisms: taking over a larger share of local investment costs, provision of sectoral budget support (in particular, to the social sectors), explicit finance of recurrent costs subject to effective time limits, and support of macro policy reforms undertaken by the Sahelian countries. (Chapter XIV)

7. The Working Group's 21 recommendations to the Sahelian governments, international finance agencies, CILSS, and Club du Sahel embrace expansion of the Sahelian countries' real tax base by means of macro policy reforms that accelerate the growth of private sector production, improvement of project preparation and implementation procedures, increased efficiency of recurrent expenditure, introduction of cost recovery procedures based primarily on user charges, as well as a reorientation of transfer mechanisms for public development assistance and creation of a fund to support macro-economic policy reforms by the Sahelian countries. (Chapter XV)

Résumé

1. Peu de temps après sa création (1976), le Club du Sahel prit conscience des pressions qui s'exercaient sur les budgets des différents Etats membres du CILSS (Gambie, Haute-Volta, Iles du Cap-Vert, Mali, Mauritanie, Niger, Sénégal, Tchad). Il s'inquiéta, en particulier, des tensions que pourrait créer un financement local insuffisant des dépenses de fonctionnement et d'entretien (*les dépenses récurrentes*) des opérations mises en place dans le cadre du programme de première génération (1978-82), à une époque où les donateurs auraient fait face à leurs engagements et se seraient orientés vers le financement d'autres interventions, au Sahel et ailleurs. La 3^{e} conférence du CILSS et du Club du Sahel (Amsterdam, 1978) confia à un Groupe de travail (*Groupe de travail sur les dépenses récurrentes*), composé de représentants des Etats sahéliens et des organismes de financement international, d'experts sahéliens et non sahéliens et des représentants du CILSS et du Club, le mandat d'effectuer une étude, en précisant que l'analyse soit effectuée tant sur le plan macroéconomique (l'équilibre budgétaire des Etats) que sur le plan microéconomique (au niveau des projets et opérations de développement). De 1978 à 1980, le Groupe de travail étudia, conformément à ce mandat, 29 opérations de développement au Sahel mises en place dans 8 secteurs socio-économiques (agriculture, hydraulique rurale, élevage, pêche, forêts, infrastructure des transports, éducation et santé) ainsi que les budgets de 7 des huits Etats de la région (le Tchad n'ayant pas pu être étudié pour des raisons de conjoncture politique). Le Groupe de travail se réunit à quatre reprises à Ouagadougou pour examiner le progrès des travaux en cours (janvier, mai et novembre 1979) et pour discuter et approuver, sous réserve de modifications, un projet de rapport final (juin 1980). En février 1980, le Groupe de travail organisa une consultation itinérante de trois de ses membres, auprès des administrations nationales des Etats sahéliens, pour, d'une part, recueillir les critiques et commentaires de celles-ci aux études techniques et, d'autre part, examiner avec les hauts fonctionnaires sahéliens certaines recommandations affectant les politiques internes des Etats

susceptibles d'être intégrées au rapport final. A la fin de mars 1980, les représentants des principales agences bilatérales et multilatérales de financement international, impliquées au Sahel, se réunirent à l'Université de Montréal afin d'étudier des options de recommandations qui étaient susceptibles d'être reprises dans le rapport final.

Ceci est le rapport final du Groupe de travail (chapitre I).

2. Le Groupe de travail propose de définir les dépenses récurrentes comme étant *l'ensemble des flux annuels de dépenses brutes de l'Etat et de ses agences, en monnaie locale et en devises, occasionnées par le fonctionnement et l'entretien d'une capacité installée, génératrice de bénéfices socio-économiques, quelle que soit la source de financement de ces dépenses, intérieure ou étrangère.*

Une caractéristique essentielle de la définition proposée - qui rend d'ailleurs cette dernière différente des définitions implicites des dépenses récurrentes suggérées antérieurement (telle la définition du Comité d'Aide au Développement de l'O.C.D.E.) - est qu'elle insiste sur le fait que la capacité considérée (une école, des facilités sanitaires ou de protection des cultures, ...) doit avoir été mise en place et atteint sa phase de fonctionnement normal pour que puissent lui être associées des dépenses qualifiées de récurrentes. Toutes dépenses antérieures au début de la phase de fonctionnement normal, qu'elles correspondent à de la formation de capital physique et institutionnel ou à des dépenses courantes, sont définies comme étant non récurrentes ou de développement.

Le rapport s'attache également à définir deux autres concepts: le *coefficient de dépenses récurrentes* et le *recouvrement des dépenses récurrentes*. Le coefficient de dépenses récurrentes est le flux annuel moyen des dépenses récurrentes divisé par la somme des dépenses non récurrentes associées à la mise en place d'une capacité génératrice de bénéfices socio-économiques (le tout à prix constants). Ce coefficient devrait permettre de faciliter les projections de dépenses récurrentes de capacités similaires à celle pour laquelle il a été estimé. Le recouvrement des dépenses récurrentes est

l'ensemble des mécanismes qui déterminent le montant à concurrence duquel un projet ou opération accroît directement et indirectement les revenus du secteur public.

Le rapport distingue également le flux de dépenses récurrentes, tel qu'il a été défini et estimé au stade de l'élaboration des projets, et le flux «optimal» de ces mêmes dépenses, tel qu'il apparaît aux moments subséquents de la vie du projet. Le mandat qui fut accordé par le CILSS et le Club du Sahel au Groupe de travail a en effet correspondu initialement à une préoccupation concernant l'incapacité de faire fonctionner et d'entretenir les opérations de développement au niveau qui avait été prévu dans les documents de projets. Le Groupe de travail a élargi cette préoccupation, en stricte conformité d'ailleurs avec les objectifs que le CILSS et le Club du Sahel ont assignés à leur mission, en examinant les conditions dans lesquelles les opérations doivent fonctionner et être entretenues pour que soit maximisée la somme des bénéfices socio-économiques obtenus de l'utilisation des ressources actuelles et futures, d'orgine intérieure et étrangère. Le rapport identifie ainsi plusieurs cas où les conditions d'optimalité requièrent que la capacité installée fonctionne et soit entretenue à un niveau moins intensif ou plus intensif par rapport à ce qui avait été prévu dans les documents de projets. Toujours en relation avec la notion d'optimum, le rapport distingue au sein des bénéfices générés par les opérations, les bénéfices privés et les «biens publics», dans la mesure où, en principe le budget des Etats ne devrait pas prendre à sa charge le coût supplémentaire (coût marginal) entraîné par la production de bénéfices privés, sauf lorsque les bénéficiaires font partie du groupe des plus pauvres (les «indigents»). De tels bénéfices devraient en effet être recouvrés directement ou indirectement par les opérations elles-mêmes (chapitre II).

3. Dans l'étude des opérations et secteurs de développement, introduits au chapitre III, le Groupe de travail s'est attaché à rechercher toute évidence concernant les niveaux prévus de dépenses récurrentes et de leur recouvrement, à estimer les niveaux actuels correspondants et, là où ce fut possible, à distinguer niveaux prévus et actuels, d'une part, et niveaux «optimaux», d'autre part, tout en essayant d'identifier les sources

possibles de différences. Les principaux résultats de l'analyse des 8 secteurs sont les suivants:

i. *agriculture* (13 opérations étudiées): le processus de mise en place des opérations jusqu'au moment de leur fonctionnement normal, moment à partir duquel il est légitime de parler de recouvrement proprement dit, prend une période beaucoup plus longue que celle envisagée dans les documents de projets où la planification des opérations et la programmation des engagements d'aide correspondants se font sur des horizons excessivement courts n'excédant généralement pas cinq ans, alors qu'en fait une telle période n'est même pas suffisante pour couvrir les phases d'approche (expérimentale) et de mise en place qui permettraient aux opérations d'être «technologiquement» viables, c'est-à-dire à la fois du point de vue technique , économique, social et administratif. Le recouvrement des dépenses récurrentes est aussi handicapé, dans ce secteur, par la dimension des projets, fréquemment excessive par rapport à ce que permettrait de réaliser notre connaissance des conditions «technologiques» de mise en place et de fonctionnement. Un autre obstacle majeur au recouvrement, est l'existence de prix au producteur maintenus à un niveau inférieur dans l'intérêt, surtout, des consommateurs urbains (chapitre IV).

ii. *hydraulique rurale* (programme de forages étudié dans un pays): les espoirs, placés dans les programmes d'approvisionnement des populations des campagnes en eau potable, pour assurer un relèvement du niveau de vie rurale, sont actuellement compromis par des difficultés budgétaires. Il apparaît que des programmes de ce type ne sont pas viables si les communautés concernées ne sont pas à même de jouer un rôle important dans le fonctionnement et l'entretien des capacités installées. Le recouvrement approprié des dépenses est largement basé, dans ce secteur, sur le paiement de taxes d'usagers. Une telle procédure de recouvrement pourrait d'ailleurs, en première étape, toucher les ménages et entreprises servis par branchements (chapitre IV).

iii. *élevage* (3 opérations et étude du secteur dans son ensemble et du sous-secteur des soins de santé animale). Les opérations pastorales extensives sont sujettes aux mêmes observations que celles faites pour l'agriculture. Dans le cas du sous-secteur des soins de santé animale, les éleveurs sont conscients des bénéfices privés que leur procure la vaccination des animaux et sont prêts à en supporter le coût marginal. Ne pas profiter de la disposition à payer des éleveurs, en omettant de mettre en place un système de recouvrement des dépenses basé sur le paiement de taxes d'usager, mettrait en péril la généralisation des services de santé à l'ensemble du cheptel. D'autre part, toute politique de règlementation des prix de la viande reste un obstacle au recouvrement. Une certaine dose de subvention de l'Etat est justifiée pour les programmes de lutte contre les maladies épizootiques du bétail, le contrôle de telles maladies générant simultanément des biens publics (réduction de la probabilité de contagion pour le cheptel non vacciné) et des bénéfices privés (chapitre V).

iv. *pêche* (2 opérations). L'absence de réglementation du prix du poisson permet à des opérations visant à la modernisation de l'équipement de pêche, ainsi qu'à son entretien, de réaliser un équilibre financier. Une confusion entre activités directement productives et activités sociales insuffisamment précises risque d'imposer une charge à l'Etat dont il est difficile de prévoir le recouvrement à moyen terme. Des procédures originales d'organisation (entre autres, sur le modèle coopératif), peuvent de *facto* limiter le montant des dépenses récurrentes de telles opérations (chapitre VI).

v. *forêt* (2 opérations): dans ce secteur, le recouvrement direct des dépenses ne peut avoir lieu qu'au terme d'un certain nombre d'années, tandis que la protection accordée par les plantations aux agriculteurs (obstacle au dénuement des sols) augmente les rendements culturaux, ce qui permet un recouvrement indirect dès la fin de la période de mise en place. Les niveaux requis

d'entretien sont fonction de l'importance qu'accordent les populations aux bénéfices indirects de telles plantations (lutte contre la désertification, ...). Le recouvrement des dépenses sur base des recettes d'abattage est limité par le contrôle du prix du bois (chapitre VI).

vi. *infrastructure des transports* (analyse du secteur avec surtout celle de l'infrastructure routière): de tous les secteurs analysés au Sahel, celui de l'infrastructure routière est le cas le plus évident où la capacité installée est à sa phase de fonctionnement normal et se détériore étant donné un niveau d'entretien inférieur à ce qui avait été initialement prévu. Même dans le cas où des recettes fiscales déterminées sont réservées à l'entretien routier et sont déposées à cet effet dans un fonds routier, une partie d'entre elles est souvent réallouée à d'autres secteurs où le bénéfice additionnel généré par la disponibilité de fonds est considéré comme étant supérieur. Inquiets d'une situation où les pays redimensionneraient leurs réseaux de transport en-deça du kilométrage prévu dans le but de réduire des dépenses d'entretien, les organismes de financement international ont accepté de financer explicitement des dépenses récurrentes, plus dans ce secteur que dans d'autres, même si cela prit la forme «détournée» de programmes de réhabilitation ou d'entretien différé (chapitre VII).

vii. *éducation* (3 opérations et analyse du secteur). En liant l'expansion de la capacité physique du secteur (constructions scolaires) à celles des effectifs d'enseignants, qui est à son tour limitée par des prévisions réalistes des recettes gouvernementales, les pays sahéliens ont évité la manifestation «classique» du problème des dépenses récurrentes, à savoir la sous-utilisation de la capacité physique. Dans les cas où des restrictions budgétaires sévères ont frappé les dépenses de matériel, l'entretien de l'infrastructure a été plus faible que prévu, mais étant donné la nature récente de la plus grande partie de cette infrastructure, l'incidence négative sur la qualité de l'enseignement est restée

généralement difficilement perceptible. D'autre part, c'est dans le secteur de l'éducation, que l'insuffisance des recettes budgétaires a ralenti le plus clairement l'expansion du secteur. En ce qui concerne le contrôle des dépenses, le rapport s'interroge sur le niveau relativement élevé de l'aide aux étudiants de l'enseignement post-élémentaire. Une limite est imposée au recouvrement des dépenses récurrentes dans ce secteur par la présence de biens publics (amélioration de la productivité de la main-d'oeuvre nationale suite à l'alphabétisation, ...) comme par la période relativement longue qui sépare le moment où les dépenses sont effectuées de celui où les bénéfices sont obtenus. Toutefois, le rapport soulève la possibilité de mise en place d'un système de paiement de droits calculés en fonction du revenu familial, dans le cas des institutions d'enseignement post-élémentaire, ainsi que celle d'un financement accru des dépenses d'enseignement primaire par voie d'imposition de la propriété immobilière (chapitre VIII).

viii. *santé* (1 programme national et 4 opérations de soins de santé primaires). La création d'un potentiel d'accès aux facilités de prévention et traitement ainsi que la satisfaction qu'éprouve la collectivité à voir certains de ses membres soulagés de leurs souffrances physiques ou mentales, justifient que l'Etat accorde une certaine subvention à ce secteur. Cependant, même les personnes à revenu faible sont prêtes à payer le coût marginal de traitements palliatifs améliorant leur bien-être individuel. Ne pas mettre en place un système de recouvrement de ces coûts, revient à refuser la généralisation des programmes aux autres membres de la communauté qui sont aussi disposés à payer (chapitre VIII).

4. Le Groupe de travail a procédé à une estimation du déficit *ex ante* de financement des 7 Etats sahéliens pour 1982 et de 5 d'entre eux (Haute-Volta et Mali exclus) pour 1984. Ce déficit représente la différence entre, d'une part, les engagements de dépenses de l'Etat et, d'autre part, les recettes programmées, fiscales, de transferts et d'emprunts, à l'exclusion du financement à court terme (chapitre X). L'estimation de ce déficit a été faite

dans l'hypothèse où les opérations existantes et à venir seraient appelées à fonctionner et à être entretenues de manière adéquate et où les politiques des Etats récipiendaires et les pratiques des organismes de financement international ne seraient pas modifiées par rapport à la situation présente. Le déficit estimé pour 1982 est de *180 millions de $ EU*. *Ex post*, le déficit sera financé d'une manière ou l'autre étant donné que par définition les dépenses totales de l'Etat sont égales à ses recettes. Ce financement est principalement réalisé de deux manières, chacune d'elle affectant un volet du compte de l'Etat: certains engagements de dépenses peuvent ne pas être tenus et/ou les recettes peuvent être augmentées au-delà de leur niveau prévu par des apports à court terme. La plupart des pays du Sahel ont connu les deux situations. Le chapitre XI montre qu'en 1978 les apports extérieurs à court terme se sont élevés à 165 millions de $ EU. Bien qu'il n'existe aucune estimation des engagements de dépenses qui n'ont pu être remplis, l'étude des opérations et des secteurs (chapitres III à IX) suggère que ce montant n'est pas négligeable.

Dans un avenir prévisible, la capacité additionnelle d'emprunter sur le marché local d'une manière non inflationniste et de bénéficier d'aides à court terme, sans contraintes politiques excessives,reste faible. Le rapport conclut en conséquence que la présomption qui a incité de CILSS et le Club du Sahel à commanditer la présente étude - à savoir que le «fardeau» de l'ajustement pèsera surtout sur les engagements de dépenses publiques et, plus particulièrement, sur les dépenses récurrentes des opérations de développement - a de sérieux fondements. La question qui se pose est: quelles sont les options ouvertes pour réduire le déficit *ex ante* estimé à 180 millions de $ EU? Le rapport considère que toute réponse à cette question doit s'appuyer sur une analyse préalable des contraintes actuelles qui expliquent la rigidité à la baisse, des engagements de dépenses, et celle, à la hausse, des recettes programmées.

Du côté des recettes publiques, il reste peu de marge de manoeuvre pour augmenter la sévérité du système fiscal en vigueur. Les options en matière de politique interne devront surtout s'attacher à corriger la faible croissance du secteur non étatique qui empêche la formation d'une base réelle d'imposition suffisante pour couvrir des engagements, même minimaux, de dépenses. Du côté des dépenses elles-mêmes, ce sont principalement l'obligation des

Etats de garantir un emploi dans le secteur public aux finissants du système d'enseignement post-élémentaire, ainsi que celle de financer les déficits d'opération des entreprises publiques, qui rendent les engagements rigides à la baisse (chapitres XI à XII).

5. Le contexte des relations internationales, comme les dangers d'un financement extérieur excessif, font que la solution au problème des dépenses récurrentes repose principalement sur des mesures de politique interne à prendre par les Etats sahéliens eux-mêmes. En ce qui concerne les mesures sectorielles (microéconomiques) possibles, le Groupe de travail a retenu: l'amélioration du flux d'information sur les besoins de nature récurrente des opérations; l'étude des implications de nature récurrente au moment de l'évaluation des projets; l'utilisation d'un prix de référence (supérieur à l'unité) pour le revenu non engagé de l'Etat dans l'évaluation des projets; une meilleure prise en considération des incertitudes liées à la réalisation des projets (allongement de la période de mise en place et distinction entre phases d'approche et de mise en place proprement dite, voire le redimensionnement de certaines opérations); le réexamen de certaines politiques sociales (gratuité de l'enseignement, des soins de santé primaires, de l'eau potable) qui limitent, faute de financement, à la fois l'entretien des facilités existantes et l'accès de la majorité de la population à des facilités nouvelles. En ce qui concerne les mesures globales (macroéconomiques), les consultants du Groupe de travail suggèrent que soient reconsidérés le principe de l'Etat-employeur et la tendance prédominante de l'Etat d'utiliser des facteurs rares et que disparaisse la suspicion entretenue à l'égard du secteur d'activité non étatique. Pour ce qui est de la disponibilité en facteurs rares, il est à souligner que les petites et moyennes entreprises n'ont pas un accès suffisant aux disponibilités en main-d'oeuvre spécialisée et en capital, ce dernier étant contingenté suite à l'existence, dans le marché organisé du crédit, d'un taux d'intérêt réel faible, le plus souvent négatif, tandis que les taux d'intérêt du marché inorganisé du crédit atteignent des niveaux prohibitifs en regard du taux de rendement attendu des investissements productifs (chapitre XIII).

6. Les organismes de financement international ont aussi leur rôle à jouer dans la recherche d'une solution au problème des dépenses récurrentes. Le Groupe de travail considère que les donateurs doivent persévérer dans leur effort actuel de suppression d'une série de pratiques qui aggravent *de facto* le problème des dépenses récurrentes: l'utilisation de technologies inappropriées (normes de construction peu adaptées, interventions excessives au stade du fonctionnement des opérations, ...); l'ignorance de l'incidence de la multiplicité des opérations sur l'augmentation du prix des facteurs locaux; le manque d'attention accordée à la programmation budgétaire des opérations; la sous-estimation de la phase de mise en place des opérations; l'incapacité de faire face aux exigences techniques de suivi des projets; l'inconstance des stratégies de développement. Le Groupe de travail voit également la possibilité de réallouer une partie de l'aide, présentement mobilisée par la mise en place d'opérations, à des modes de transfert plus efficaces et plus flexibles: prise en charge plus importante des dépenses d'investissement local, l'octroi d'aides budgétaires sectorielles (en particulier, aux secteurs sociaux), le financement explicite et limité dans le temps des dépenses récurrentes et le support à des réformes de politique globale des Etats sahéliens (chapitre XIV).

7. Les 21 propositions de recommandations que fait le Groupe de travail aux Etats sahéliens, aux organismes de financement international, au CILSS et au Club du Sahel, couvrent l'élargissement de la base réelle d'imposition des Etats sahéliens moyennant l'adoption de réformes globales visant à accélérer la croissance du secteur non étatique, l'amélioration des procédures d'élaboration et d'exécution des projets et opérations, l'augmentation de l'efficacité des dépenses récurrentes, la mise en place de procédures de recouvrement des dépenses fondées principalement sur le paiement du coût d'usage, la réorientation des modes de transfert de l'aide publique au développement et la création d'un fonds de soutien aux réformes de politique globale des Etats sahéliens (chapitre XV).

Chapter One: ORIGIN, OBJECTIVES, AND ORGANIZATION OF THE STUDY

I.1 Operation and maintenance expenditures of public investment programs, or recurrent costs: a relatively recent priority

"Both the theory and practice of development policy would suggest that investments are a major factor in economic growth. Yet throughout the developing world the productivity of public investments and programs that are already in place has been seriously jeopardized by the failure of governments to provide adequately for their operation and maintenance over time. Rare is the country that has not witnessed this phenomenon..... The resulting loss in productivity and the deterioration of capital stock not only affect existing projects and programs but cast a disturbing shadow on the economic viability of future investment programs."

The author of these lines, the American economist Peter Heller[1], spreads the responsibility for this state of affairs, adding: "....In general, external aid flows have only exacerbated this problem by enabling a country to increase the level of its investment without directly encouraging the growth of recurrent revenues."

Already in 1966, Wolfgang Stolper had sounded the alarm by calling attention, in his study of the Nigerian economy, to the macroeconomic problem posed by operation and maintenance expenditures of public investment programs, i.e. recurrent costs. These are part of the government budget, and, given constraints on local capabilities to tax and borrow, their existence diminishes the government's capacity to implement new investment programs.[2]

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[1] "The Underfinancing of Recurrent Development Costs," Finance and Development, vol. 16, n°1, March 1979, pp.38-42.

[2] Planning Without Facts: Lessons in Resource Allocation from Nigeria's Development, Harvard University Press, Cambridge, Mass., March 1966, pp. 45, 73, 78, 80, 105, 140, 152, 214, 255 and 265.

Nevertheless, until 1977 the recurrent cost problem seems to have remained a secondary concern on the part both of development administrators and academic economists. The exceptions to this lack of interest stand out all the more: in 1971, Peter Heller formalized the recurrent cost problem within the framework of a macro analysis of the Kenyan economy and calculated, for that country, a first set of sectoral recurrent cost coefficients.[1] In 1976, Michel Labonne expressed the fear that, given the difficulties which governments of developing countries were having in financing recurrent costs of projects under their control, certain of the projects financed by the international community were being imposed on local administrators, rather than being directed and managed by them.[2]

The year 1977 marks a turning point in that the Development Assistance Committee of the Organisation for Economic Cooperation and Development recognized that the development efforts of countries receiving public development assistance could be compromised if worthwhile projects were not implemented on the ground that the beneficiaries were not in a position to provide or obtain funds required to cover local costs, including recurrent costs of operation and maintenance.[3]

In May of the same year, the Permanent Inter-State Committee for the Struggle against Drought in the Sahel (CILSS) and the Club du Sahel put the recurrent cost problem on the agenda of their second conference, held in Ottawa.

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1 "The Dynamics of Project Expenditure and the Planning Process: with Reference to Kenya," Ph.D. thesis, Harvard University, whose results were published in P.S. Heller: "Public Investment in LDC's with Recurrent Cost Constraint: the Kenya case", Quarterly Journal of Economics, May, 1974, pp. 251-277.

2 "La dégradation de la situation paysanne dans les pays sahéliens avant la sécheresse", Revue juridique et politique, indépendance et coopération, Volume XXX, n° 4, December 1976, pp. 389-502.

3 O.E.C.D.: Development Cooperation -- 1977 Review, Paris, November 1977, pp. 185-188.

I.2 Countries of the Sahel and the struggle against drought in the Sahelian region

From 1969 to 1974, the countries in the Sudano-Sahelian region experienced, without interruption, six years of heavy drought.

In March 1973, representatives of six countries in the region (Chad, Mali, Mauritania, Niger, Senegal, Upper Volta) established in Ouagadougou, capital of Upper Volta, the Permanent Inter-State Committee for the Struggle against Drought in the Sahel (CILSS) which was instructed to concern itself not only with the problems of obtaining and allocating emergency assistance to the region, but also with participating in the establishment of medium- and long-term projects. Two other countries subsequently joined the CILSS: the Gambia (late 1973) and the Cape Verde Islands (1976).[1]

In March 1976, the Club du Sahel (first known as Club des amis du Sahel) was established at a meeting in Dakar. The Club, whose secretariat is located at the O.E.C.D. in Paris, is an informal body where the representatives of organisations providing bilateral and multilateral assistance to the region work together with representatives of the CILSS member countries to harmonize their policies and interests. Following its organizational meeting in Dakar the Club, in conjunction with the CILSS, has organized two other conferences (Ottawa, May 1977; Amsterdam, November 1978) as well as numerous colloquia and meetings of a more technical character.

In 1977, the total population of the eight Sahelian countries was close to 29 million (Table 1.1). The total Gross National Product (GNP) of the region, amounting to US$ 5.5 billion, was about 40% less than the GNP of Ireland in the same year. Average GNP per capita of US$ 196 -- with a maximum of US$380 for Senegal and a minimum of US$ 120 for Mali -- was itself 60% less than the average for all African countries of US$ 490. With the exception of Senegal, the Sahelian countries were considered by the World Bank as belonging to the group of Least Developed Countries.

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1 The term "Sahel", as utilized in this report, covers the eight member countries of the CILSS, notwithstanding the precise geographic definition of the term, which applies only to certain subregions within those countries, and on the other hand covers also subregions of other African countries which are not members of the CILSS.

TABLE 1.1

GNP, GNP per capita and population of the CILSS member countries (1977)

Countries	GNP (US$ millions)	GNP per capita (US$)	Population (000)[1]
Cape Verde Islands	50	160	313
Chad	560	130	4,221
The Gambia	120	210	554
Mali	720	120	6,129
Mauritania	410	270	1,503
Niger	950	190	4,862
Senegal	1,980	380	5,240
Upper Volta	760	140	5,465
Region	5,550 (total)	196 (weighted average)	28,287 (total)

[1] Mid-1977

Source: World Bank: 1979 Atlas, Washington, p.12.

In 1976-77, a Club du Sahel working group chaired by the CILSS coordinating Minister, Mr. Boulama Manga, established a long-term development strategy and an action program (known as the First Generation Program) for the region covering the period 1978-82.

The central long-term objective of the strategy is the attainment of self-sufficiency in food, understood as the absence of recourse, for the region as a whole, to foreign imports of foodstuffs. Attainment of the objective is tied principally to the development of rainfed agriculture, the establishment of irrigation schemes, extension of the transport network, increased protection both of crops and the environment, and expansion of present capacity in the health and education sectors. The concrete results expected from the strategy are a better balance between rain-fed and irrigated agricultural activity, elimination of the isolation of food-producing regions, reduced dependance on foreign markets, and , in general, increased agricultural productivity.[1]

The total cost for the international community of the projects in the First Generation Program (1978-1982) in support of this strategy was estimated at US$ 3.06 billion in 1977 prices (Table 1.2).

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[1] Club du Sahel: "Strategy and Program for Drought Control and Development in the Sahel," O.E.C.D., Paris (first version dated 1977; revised version of May 1979 prepared in the light of the report presented at the Amsterdam conference). After the first version of the strategy appeared it was admitted that, taking into account possibilities for developing intra-regional trade, food self-sufficiency at the regional level did not necessarily mean food self-sufficiency at the level of each country insofar as certain of the countries, and in particular the land-locked countries, would move towards the production of surpluses that could be exported to the rest of the region.

TABLE 1.2

Sectoral breakdown of US$ 3.06 billion planned for the First Generation Program (1978-1982)

Percentages

	Sectors	(%)
1.	Dry Land Farming	22.0
2.	Irrigated Agriculture	29.6
3.	Village and Pastoral Water Supply	2.4
4.	Livestock	10.6
5.	Fisheries	2.4
6.	Crop Protection	2.3
7.	Environment and Forestry	5.9
8.	Marketing	0.9
9.	Transport and Infrastructure	12.4
10.	Human Resources (health, education,...)	11.5
	TOTAL (1-10)	100.00

Source: CILSS-Club du Sahel: "Financing the First Generation Programme within the Overall Sahel Development Programme," Sahel D (78) 27, November 1978, Volume II, p.9.

I.3 Evolution of the CILSS and Club du Sahel's concern with the recurrent cost problem.

Shortly after its establishment, the Club du Sahel began to take increasing cognizance of pressures that were being experienced by the budgets of the different Sahelian countries. It was concerned in particular with the tensions which might arise from insufficient local financing of operation and maintenance costs of projects established within the framework of the First Generation Program at a time when the donors would have fulfilled their commitments and would be moving towards financing other activities in the Sahel or elsewhere.

Accordingly in early 1977 the CILSS and the Club du Sahel commissioned a study to measure, in terms of both local costs of investment and recurrent costs of operation and maintenance, the effects of a US$ 10 billion investment program, assumed to be implemented in the Sahel with expenditure spread evenly over a ten-year period.[1] Using in their projections cost coefficients obtained from World Bank project appraisal reports, the authors concluded that the investment program would generate, for the region as a whole, a cumulative net financial deficit of US$ 4.2 billion over 10 years. On an annual basis, this deficit would correspond roughly to 7.6% of the region's total 1977 GNP.

Fully conscious of the implications of this finding and confronted with certain concrete manifestations of insufficient financing of operation and maintenance of projects already underway in the Sahel, the CILSS and Club du Sahel decided in Ottawa from then on to give priority attention to the problem and to elements of a possible solution.

During the period between the Ottawa and Amsterdam (November 1978) conferences, the CILSS and Club du Sahel secretariats sought the advice of the Sahelian governments and donor agencies, as well as that of consultants from the Sahel and elsewhere, in elaborating a detailed program of research on recurrent costs. At the same time the secretariats sought material support from finance agencies for the formation of a working group (Working Group on Recurrent Costs) where Sahelian and non-Sahelian

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[1] W. Beazer, M. Burstein and L. Pulley: "Foreign Aid and the Domestic Costs of Sahel Development Projects"(May 1977), English and French summaries of which were submitted to the second CILSS- Club du Sahel conference (Ottawa, 1977).

consultants, and representatives of the recipient governments and aid donors could pool their efforts to formulate a diagnosis and propose recommendations. The CILSS-Club du Sahel initiatives led in 1978 to the formation of the Working Group and made possible the presentation at the Amsterdam Conference of a research program on recurrent costs, accompanied by two pilot case studies concerning rural development projects.[1] In its final communiqué:

> the Amsterdam Conference expressed the wish that "the work undertaken should be pursued on both the macroeconomic (government budgets) and microeconomic (development projects) levels", and asked the Working Group "to devote itself to developing practical solutions to the problems raised by the financing of recurrent costs."

The present document is the final report of this Working Group.[2]

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1 Bénédic and Bosshardt : "Contribution à l'étude des charges récurrentes des projets de développement rural: le cas du projet Siné-Saloum au Sénégal", joint study of the Caisse Central de Coopération Economique and the Ministry of Cooperation, Paris, October 1978.

A. Martens (in collaboration with J. Sorgho and J. Kessous): "Les besoins d'entretien de la surface rizicole aménagée de l'Office du Niger au Mali" C.R.D.E., the University of Montreal, Montreal, October 1978.

2 The composition of the Working Group on Recurrent Costs was given in the introduction to this report and the names of the persons associated with it are given in Annex A.

I.4 Organization of the study

From September 1978 to November 1979, the Working Group analyzed recurrent cost aspects of 29 development projects in the Sahel, falling within the sectors of agriculture, rural water supply, livestock, fisheries, forestry, health, education, and transport infrastructure. During the same period an analysis was carried out of recurrent costs at the level of the national budget of each of the Sahelian countries, with the exception of the Republic of Chad, given the political situation in that country . Coordination of the methodology for the technical studies was achieved by plenary meetings of the Working Group held in Ouagadougou at the CILSS executive secretariat and in the presence of a representative of the Club du Sahel secretariat in January, May and November 1979. At the November meeting, the technical studies were subjected to detailed criticism and an outline for the final report, entitled "The November 1979 Phase," was discussed at length.

The results of the November 1979 meeting permitted the CILSS executive secretariat to submit a progress report on the study to the ordinary session of the CILSS Council of Ministers held at Ouagadougou on January 11-12, 1980.

In February 1980, the Working Group organized a "consultation itinerante" whereby three of its members met successively with officials in six Sahelian countries to , on the one hand, receive their criticisms and comments on the technical studies and, on the other hand, examine with responsible Sahelian officials certain recommendations concerning internal government policies subject to possible inclusion in the final report. In late March, 1980, representatives of the principal bilateral and multilateral aid agencies involved in the study met at the University of Montreal to study alternative recommendations for the final report.

Finally , meeting at Ouagadougou in June 1980, the Working Group examined a preliminary version of the final report, and agreed on changes for the present definitive version submitted to the CILSS and Club du Sahel in August, 1980.

I.5 The principal questions

The principal questions which the Working Group has endeavored to answer are the following:

1. How to define, in both a general and at the same time sufficiently operational manner, the concepts of recurrent costs, the recurrent cost coefficient, and recovery of such costs? What are the normative aspects of such concepts within the framework of optimal programming of recurrent expenditures and their recovery? (Part One, Chapter II).

2. What concrete manifestations exist that actual levels of recurrent expenditure and cost recovery in different sectors and projects diverge from planned and optimal levels? Are certain sectors and projects more susceptible to such divergences than others? To what extent have cost recovery mechanisms succeeded in covering shortfalls in recurrent cost financing? What is the impact of inadequate financing of planned and optimal recurrent expenditures on the rate of project implementation and achievement of sectoral objectives? (Part Two).

3. What additional insights into the problem of recurrent cost financing are provided by taking a macro viewpoint at the level of each national economy? What major constraints on revenue generation and overall expenditure control limit the Sahelian countries' ability to finance planned and optimal levels of recurrent expenditure on development projects and programs? To the extent these constraints will persist in the foreseeable future, what is the projected fiscal deficit of the Sahelian countries based on their obligation to ensure adequate financing of recurrent costs? (Part Three).

4. What instruments are (or might be) available to the Sahelian countries to relax these constraints and thus reduce the projected fiscal deficit? What is the relative effectiveness of these instruments in the regional context? (Part Four, Chapter XIII).

5. What are current practices with respect to external financing of recurrent costs? How far can one say that the policies and practices of aid donors have aggravated or alleviated the problem of recurrent cost financing in the Sahel? Can existing criteria for allocation of external finance be used or should new criteria be suggested with a view to resolving the problem? (Part Four, Chapter XIV).

6. Based on the answers to 4 and 5, what recommendations might be offered to the Sahelian countries and international finance agencies with regard to financing of recurrent costs, and, on the other hand, what follow-up mechanisms might be suggested to the parties to ensure that recurrent costs are henceforth regarded as one of the critical variables in the overall programming of development in the Sahel as well as of each phase in this process? (Part Five).

It should be stressed that these six sets of questions did not figure as an explicit work program from the outset of the Group's activity. The formulation of pertinent questions was rather the result of an evolutionary process involving, from November 1978 to June 1980, the members of the Working Group on Recurrent Costs, responsible officials of most of the countries and finance agencies concerned, and the CILSS and Club du Sahel secretariats.

Chapter Two: OPERATIONAL DEFINITIONS

II.1 Introduction

The following concepts are central to the discussion in this report, underlying the development of its argument:

i. recurrent and non-recurrent costs and expenditures;*

ii. the recurrent cost coefficient;

iii. recovery of recurrent costs.

Observing international development practice or referring to the literature, official or otherwise, concerning Public Development Assistance (PDA), one notes that these concepts mean very different things as used by one or another donor agency or aid-receiving country. The object of the present chapter is to propose a definition of each of these terms that should be conceptually acceptable to both international finance agencies and aid recipients and which we would recommend that they adopt.

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*Note to English version of the final report: Where the French version of this report uses exclusively the term "dépense récurrente" the English version uses both "cost" and "expenditure" sometimes interchangeably but sometimes also to mean different things.

An expenditure is the act of laying out money towards a particular objective. Whether an outlay has occurred or not at a specific time is a question of fact; the amount of the outlay is subject to precise measurement; and the term "expenditure" is devoid of normative connotations. Wherever data was available the project case studies serving as an input to this study record actual expenditure over a historical period (ex post recurrent expenditure).

By contrast, the term "cost" -- again representing here financial rather than real magnitudes -- is often used to denote an anticipated need to incur future expenditure of a specific amount in order to attain certain objectives. When talking about "the cost" of gaining a certain objective one usually implies the "least" cost from the viewpoint of the party pursuing the objective. The Sahelian countries and the donors have commissioned the present study with a view to examining ways and means of financing future flows of cost-efficient recurrent expenditures. The report's policy recommendations are therefore based on an analysis of ex ante recurrent costs, comprising optimal expenditure flows to be facilitated by various mechanisms for mobilizing and economizing resources. The question of optimization is addressed in section II.3 below.

Apart from defining these concepts, for the sake of clarity in the report we have sensed the need to specify at an early stage the normative aspects associated with them. Thus, the present chapter concludes with an examination of alternative criteria which may be used to determine optimal levels of recurrent expenditures and their recovery.

II.2 Definition of recurrent and non-recurrent costs and expenditure

It should be noted at the outset that the reader will not find in this chapter a mini-manual of classification of recurrent and non-recurrent costs and expenditure, differentiated by sector. The main reason for this is that the classification of a particular expenditure as between recurrent and non-recurrent varies over the period of time which a project requires to attain its stage of maturity, i.e. normal operation.

Nevertheless, the discussion in this chapter of criteria for assessing project maturity, together with illustrative applications in Part Two, is designed to enable the reader to identify recurrent as opposed to non-recurrent costs and expenditure when confronted with ex ante or ex post project evaluations. This is what we mean by the operational character of the proposed definition. The reader who is looking for detailed lists of expenditure items included within the two categories with respect to the development projects studied by the Working Group can always refer to the technical reports in question, should he regard the information presented in Part II of this report as insufficient.[1]

As the preceding paragraphs indicate, we have considered it both useful and more convenient to propose operational definitions of recurrent and non-recurrent expenditure by taking as our point of departure the microeconomic unit that comprises a development project. However, in Part Three of the study, devoted to macroeconomic analysis of recurrent costs based on Sahelian government budgets, we raise a number of accounting and conceptual problems that arise in passing from analysis of the individual project to that of the economy as a whole.

[1] A list of these reports, together with the names of the respective authors, is given in Annex B.

We propose the following definition of recurrent expenditure:

> The set of annual flows of gross expenditure of the government and its agencies, in local currency or foreign exchange, undertaken in order to generate socio-economic benefits in connection with the operation and maintenance of a unit of installed capacity, regardless of the source of finance of the expenditures in question, domestic or foreign.

The term "non-recurrent", on the other hand, refers to all expenditures incurred in connection with establishing this capacity, regardless of the nature of the expenditure (purchase of capital goods or current inputs, personnel payments, etc.), the type of payment (in foreign exchange or local currency) and the source of financing. "Non-recurrent," "establishment," and "development" costs or expenditures will be considered as synonymous in this report.

Such definitions can be applied to a particular project on the basis of a relatively detailed discussion of their constituent elements. This is undertaken in the following sections.

II.3 Constituent elements of the definition of recurrent costs/expenditure

1. The notion of installed capacity

The reference to "installed" capacity indicates that we start counting recurrent costs only after a project has been established. In other words, we consider that the notion of recurrent costs/expenditure has concrete meaning only once the project has attained its phase of normal operation. All expenditures undertaken before the commencement of normal operation are thus classified in the category of non-recurrent or development expenditures.

This principle requires qualification with respect to projects which consist of replicating identical units of productive capacity in different locations. This is illustrated by rural water supply programs: once a well has been dug or drilled, it requires maintenance even if the program as a whole has not yet been completed.

With regard to projects undertaken by the state and its agencies, one can, by simplifying a bit, distinguish two forms of installed capacity producing socio-economic benefits. The first form comprises physical infrastructure: school buildings, roads, hospitals, irrigation networks, etc. The establishment phase corresponds to capital formation in the sense in which this is used in national income accounting, namely, construction and purchase of equipment. The operating phase involves recurrent costs of maintenance (grading of dirt roads, cleaning of irrigation ditches, repair of school roofs) and operation (teachers' and doctors' salaries , purchase of drugs and school supplies, etc.).

The second form of installed capacity, corresponding principally to human and institutional capital formation, has an amorphous quality. The process of establishing such capacity comprises first and foremost the creation of a stock of skills and institutional mechanisms which generate the benefits that society expects from the project in question through interaction with the socio-economic system. An example here is that of crop protection activities where it is difficult to maintain that the expected return depends first and foremost on the purchase of back sprayers, the construction of storage depots or other physical investments. In fact, the success of crop protection activities depends primarily on the effort made to convince the farmer that it is in his personal interest to use pesticides, assuming, of course, a satisfactory rate of return for society as well. In such a case, all expenditures carried out before gaining the consent of the farmer must be considered as non-recurrent even if they comprise in large part current expenditures such as purchase of inputs, salaries of agricultural extension agents, etc. Other examples of this second form of installed capacity are found, inter alia, in primary health care programs, livestock

vaccination, and agricultural research.

In other words, in this second case recurrent expenditures cannot be directly related to the operation and maintenance of an identified and observable physical infrastructure such as school buildings, roads, hospitals, and irrigation networks. It is a matter of defining a period of establishment expressed as a finite number of years during which certain current expenditures must be capitalized. It is only after this period that we can talk about recurrent expenditures as such, in the sense that the installed capacity has been shown to have attained its desired level of socio-economic return. We will show later that it is failure to define a reasonable period for establishment of such projects that has frequently lead to what might be termed a false recurrent cost problem, certain current inputs in the establishment phase having been in effect confused with recurrent expenditures.

Finally, it should be mentioned that the two forms of capacity -- physical infrastructure and the sum of current expenditures capitalized during the establishment phase -- are frequently found within one and the same project: irrigation schemes, while contributing primarily to expansion of the national irrigation network, may include programs for training smallnolders and improving their health situation.

2. The concept of gross costs/expenditure

The term "gross" indicates that we will measure recurrent expenditure before subtracting public sector receipts, in cash or in kind, to which a project may give rise.

Apart from the fact that estimation of public sector receipts to be attributed to a project is not devoid of a certain ambiguity[1], we believe that recurrent cost analysis should focus in the

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[1] See Section II.8.

first instance on the total process of cost generation independant of any mechanisms of cost recovery. Looking only at net expenditures would incur the danger of overlooking the nature of the process that generates the expenditures to begin with.

An exception to the rule of measuring gross expenditures is the case of state-owned enterprises producing goods or services for sale on a commercial basis, where only the operating deficit, for which the state bears responsibility, constitutes a recurrent expenditure.

Finally, it should be noted that business accounting practice calls for capitalizing all expenditures that are not covered by the same year's revenue. Clearly what we are proposing differs from that convention.[1]

3. Expenditures in local currency and foreign exchange

For reasons which are not entirely clear to us, some observers have apparently considered that to be treated as recurrent, an expenditure must take place in local currency, i.e. be devoted to the purchase of locally produced goods and services. In reality, project operation and maintenance also require imported goods and services (fuel, spare parts, etc.) which may, as in the case of road maintenance, constitute a major share of recurrent expenditure. Thus, according to the definition we propose, expenditures in both local currency and foreign exchange are treated as recurrent.

4. Domestic and foreign financing

According to the traditional model of development project aid, public development assistance is provided only during the phase of project establishment and ceases upon the initiation of normal operation. In recent years, however, some foreign project aid has been allocated to expenditures that meet our definition of recurrent, particularly in

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[1] Nonetheless some members of the Working Group would have preferred to define recurrent costs in "net" terms. For the reasons given above this suggestion has not been adopted.

the area of road maintenance.[1] Apart from this recent modification in aid practice, it should be noted that non-project aid has traditionally served in part to finance operating and other recurrent expenditures, particularly within the framework of technical assistance. For some donors this is a significant item: for example, during 1975-78, 76 per cent of aid provided to the Sahel by the French Fonds d'Aide et de Cooperation (FAC) was nonproject, 47% of this being allocated to technical assistance.[2]

Just as we suggested above that recurrent expenditures should be measured gross of public receipts eventually engendered by the project in question, it is proposed here that recurrent expenditures should be measured independently of their mode of financing, domestic or foreign.[3]

5. The government and its agencies

This final key element in the definition of recurrent costs places the project, from the viewpoint of receipts and expenditures, within the framework of the consolidated government accounts, comprising the accounts of the central government, local authorities and all public sector agencies with the exception of state-owned enterprises of a commercial character with respect to which, as already indicated, only the operating deficit is taken into account.

Given the special character of state crop development authorities the question frequently arises whether to regard their transport, processing and distribution functions as public sector recurrent costs. In our view the quasi-commercial nature of these functions causes them to differ sufficiently from, for example, the agricultural extension function sometimes carried out by the same agencies, to warrant including the costs of transport, processing and distribution only to the extent

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[1] The case discussed in the text is distinct from that where donors with flexible aid policies provide financial assistance to projects, particularly in the rural development field, beyond the initially planned establishment phase, in view of delays encountered in attaining the stage of normal operation. According to our definition such assistance represents financing of non-recurrent or development costs.

[2] Source: CILSS-Club du Sahel: "Public Development Assistance to CILSS Member Countries, 1975-1978," D(79) 38, Paris, October 1979, p.46.

[3] It should be clear to the reader that domestic financing of a project covers not only government contributions -- budget appropriations, etc.--but also any form of reimbursement of costs by the project's direct beneficiaries, i.e. payment of user charges, etc.

they are not covered by operating receipts.

Finally, costs incurred by economic agents outside the public sector and not reflected in public accounts, even though the activity is the object of a public sector intervention, are generally excluded from our concept of recurrent costs. This applies, for example, to inputs purchased by farmers, wages of agricultural labor, etc.[1] On the other hand, when considering recurrent costs of the social sector (education, health), we suggest treating these gross of contributions by members of the community to remuneration, in cash or kind, of teachers and health workers.

It should be noted that insofar as recurrent costs are financed directly by foreign aid agencies, they are generally not included in the budgets of the government or its respective projects. In the context of our definition, the concept of the government's consolidated account therefore has to be expanded to cover such expenditures.

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[1] For a qualification to this rule see our discussion of the treatment of agricultural input subsidies in Chapter IV.

II.4 Recurrent expenditure and financial vs. economic costs

The concern that has motivated the CILSS and Club du Sahel to commission the present study is the possible insufficiency of financial resources to mobilize the current inputs that generate benefits over the economic lifetime of a development project. Thus, "recurrent cost" in the context of the present study is in the first instance a financial concept, and only secondarily an economic one. Naturally there is much correspondance between the two but important differences exist -- the economic cost of an activity, designated more precisely as its social opportunity cost, represents the social value of benefits foregone by allocating, to the activity, resources which have alternative uses in the economy (for example, the economic or opportunity cost of employing an additional worker in an industrial project is the agricultural output foregone by shifting that worker from the rural sector into industry). The financial cost, by constrast, values resources devoted to an activity on the basis of actual cash outlays, measured at market prices (the financial cost of an industrial worker equals the salary he receives plus the employer's cash outlays on account of fringe benefits).

A large amount of empirical evidence has been accumulated showing that prices paid to factors of production in developing countries, as

well as for the purchase of goods and services, frequently differ from those reflecting the relative scarcity of the factors, goods and services in question, or in other words, their economic or opportunity cost.

For example, in Sahelian credit markets, maintaining a real interest rate (measured in constant prices) below the profitability of capital leads to an excess demand for credit which in turn requires the establishment of credit rationing. On the other hand, to the extent purchase of foreign goods is encumbered by tariff barriers and/or quantitative restrictions, expressing input prices in local currency via the official rate of exchange leads to underestimation of their economic cost, since the official exchange rate maintains the price of foreign exchange expressed in local currency at an artificially low level. Such discrepancies between the price actually paid and the scarcity price (frequently called accounting or shadow price), tend to create distortions and misallocation of resources, such as excessive capital intensity or purchase of imports beyond the level permitted by the country's foreign exchange position. This problem is considered in more detail later in the report.[1] For purposes of the present argument it suffices to stress that prices actually paid determine the financial cost of recurrent expenditures, while accounting prices, which must be estimated through a separate calculus, determine their real or economic cost.

[1] It should be stressed that the developed countries do not necessarily escape similar discrepancies -- the debate in western countries on electricity pricing and the price which a petroleum-producing country should charge to its own refineries are representative in this regard.

II.5 Treatment of particular expenditure items

1. Indirect taxes

Insofar as prices actually paid are consumer prices, they include indirect taxes and are net of subsidies. Recurrent costs being public expenditures, such taxes appear simultaneously as receipts and expenditures, and their impact on the government's fiscal balance is nil. On the other hand, the situation from the viewpoint of the individual project is different. Indirect taxes paid by the project enter the general Treasury pool where they are mixed with other government receipts. From an accounting point of view, the indirect tax paid by the project is thus an expenditure for which there is no corresponding receipt. The same situation applies to a sectoral ministry with projects under its jurisdiction, insofar as it lacks the privilege of budgetary autonomy.

In other words, a project's financial costs -- recurrent expenditures if the period of normal operation has commenced -- include the indirect taxes it pays. From the microeconomic viewpoint, covering the payment of such taxes gives rise to a problem in financing of expenditure, just as does any other recurrent expenditure, whether the finance is obtained via direct recovery or through budgetary appropriations. The subject also touches on relations between aid donors and recipients, inasmuch as donors are not willing to finance taxes levied on projects, on the grounds that their limited aid should go to the direct project beneficiaries and not the host government. In practice this means that equipment and other goods imported under aid financing are generally exempt from all duties and taxes.

Indirect taxes pose an adjustment problem as we move from the micro to the macro level, except where the government institutes the procedure of earmarking certain of its receipts, whereupon these are channeled back to the project (for example, part of the stump tax paid to the government by forestry projects may be returned to the latter in order to finance maintenance of plantations)[1].

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[1] Referring to our discussion on the difference between financial and economic costs (Section II.4) it should be noted that economic cost is always estimated net of indirect taxes, which are not considered a cost from the viewpoint of society as a whole.

2. Public debt service

Treatment of service on public debt (principal and interest payments) is subject to ambiguities. On the one hand it unquestionably constitutes a cash outlay by government though except in the case of quasi-commercial agencies or activities the service is normally charged against some kind of consolidated fund rather than against the accounts of the agency which applied the loan proceeds.

The inclusion or otherwise of debt service should depend on the analytical context. If the object is to compare recurrent cost coefficients by categories of projects and sectors, inclusion of debt service distorts their comparison as among projects and sectors. This is because loan terms (interest rate, maturity, grace period) are determined more in accordance with individual donor credit policies and/or recipient country creditworthiness than on the basis of sector- or project- specific characteristics.

By contrast, if the objective is to calculate a recipient's global fiscal balance, as is done in Part Three of this report, then debt service is best handled globally as a single expenditure category, in which case adding it to project cost flows would constitute double counting. On the other hand, if it is desired to estimate the marginal impact on the government's projected fiscal balance of one or more specific projects, for the sake of completeness their recurrent expenditures should include debt service, though for sectoral comparative purposes subtotals should also be estimated without it.

3. Depreciation

We propose that estimated annual depreciation of a project's physical assets -- roads, dams, school buildings, etc. -- should be excluded from the recurrent expenditure stream. This is because, given the Sahelian context, it is unlikely that the replacement of such infrastructure will be, in the foreseeable future, a charge on the aid-receiving governments. Such a procedure again differs from business accounting, where all

installed physical assets are depreciated.

On the other hand, with respect to equipment associated with operation and maintenance of such infrastructure and which has a shorter economic life than the infrastructure in question (road maintenance machinery, medical and laboratory equipment, etc) it is appropriate to include the gross rental value of such equipment in project recurrent expenditure. Gross rental value represents the remuneration of services rendered by the equipment, including an annual depreciation charge.

In practice, however, gross rental value is rarely included in the recurrent costs of individual projects, appearing instead, whether at full or only partial value, in the annual budget estimates submitted by agencies such as the Directorate of Public Works to the Ministry of Finance or its equivalent. In some cases, where donors are willing to finance equipment replacement as an investment item while balking at financing of other recurrent costs, recipient governments may find it politic to treat this as a periodic "investment" item and exclude it from recurrent cost streams. In our search for an operational definition of recurrent costs, we cannot condone such a practice: if at some point foreign aid should not be available to replace the equipment, failure to charge gross rental value could leave an agency without sufficient funds to enable it to replace equipment necessary for project operation and maintenance.

II.6 Comparison with the definition proposed by the Development Assistance Committee of the OECD

Considering the central role which the DAC quite properly plays in the evolution of concepts and policies for aid to developing nations, including the Sahelian countries, we consider it useful at this point to compare our definition of recurrent costs with that which the DAC proposed in May, 1979, reproduced in its annual review of efforts and policies of the Committee members, published in November of that year.[1]

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[1] O.E.C.D.: Development Cooperation: 1979 Review, Paris, November 1979, pp. 201-202.

Although the DAC's objective is to define financing of recurrent costs rather than the concept of recurrent costs itself, its understanding of the latter concept is implicitly clear on reading the proposed definition. For the DAC, the term "recurrent cost financing:

(a) refers only to financing through official development assistance;

(b) refers to financing needs arising from specified development projects/programmes;

(c) refers to transfers of freely-convertible foreign exchange, or counterpart funds generated from commodity aid, for procurement of goods and services (including salaries of local personnel) required for maintaining and operating a given project/programme during and after completion of the initial financing;

(d) does not refer to general budgetary support." [1]

It is clear that the DAC's implicit definition of recurrent costs is contained in point(c)above, in the expression "procurement of goods and services...required for maintaining and operating a given project/programme during and after completion of the initial financing".

At first glance this definition is quite close to our own. Nevertheless the two differ on an essential point: The DAC appears to consider that recurrent costs exist not only subsequent to the phase of initial financing, but also during it, in other words during a project's establishment. As already mentioned with reference to the case of rural water supply, this situation may indeed exist insofar as finance is provided for a program which consists of installing identical units of capacity over a number of years. However, more frequently, the period comprising what the DAC calls "initial financing" corresponds to a phase during which the installed capacity has not attained its expected level of socio-economic profitability.

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[1] O.E.C.D.: op.cit., November 1979, p.201, footnote.

As we have already indicated, until that level is reached, all costs should be considered as non-recurrent.[1]

Finally, the DAC's reference to "required" procurement immediately raises the question: "required" according to whom and with reference to what? Answering this question requires explicit reference to the notion of optimality in recurrent cost analysis, which is taken up in the final section of the present chapter.

II.7 The recurrent cost coefficient

Private and public sector financial planners in developed as well as developing countries have long utilized the concept of a ratio of operation and/or maintenance to investment costs of a capital facility. As a parameter of sufficient stability on which to base financial projections, such a ratio tells us that, for example, the annual maintenance cost of a building equals X% of a building's capital cost, that teacher salaries and other instructional costs represent Y% of a school's construction cost, that current expenditures of a dispensary (costs of health, personnel, purchase of drugs, etc) correspond to Z% of the cost of construction and the installed medical equipment.

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[1] Note to English version: At this point the French version of the present report notes a reference in point (c) of the DAC's definition's official French version to maintaining and operating "des équipements" created within the framework of a project or program, rather than simply "maintaining and operating a given project/program" as in the DAC's English version. The French version of our report suggests that our term "installed capacity" is preferable to that of "équipements" since the former term more readily encompasses both physical and human/institutional infrastructure, the latter corresponding to capitalized current expenditures during project establishement. The DAC definition thus appears not entirely to escape what we call a false recurrent cost problem in the sense that difficulties may be encountered in covering costs which should be considered as having a developmental rather than recurrent character.

It is clear that the value of such a ratio will vary from one country to another, given differences in resource endowments and factor prices. It may even vary among regions within a given country insofar as interregional mobility of manpower and capital is limited, giving rise to differences in factor prices from one region to another. Within a given sector, the ratio may differ according to the type of capacity under consideration: a paved vs. gravel road, a plantation of eucalyptus vs. gmelina, etc. Finally, the ratio may vary with a country's level of development. Moreover, the ratio becomes a less tidy concept as one moves from installed capacity in the sense of physical infrastructure into that comprising human and institutional capital.

Nevertheless, in his above-mentioned 1979 article[1], Peter Heller has suggested that even in the "soft" sectors, the ratio's margin of uncertainty does not appear so great as to undermine completely its usefulness. Heller gives us an estimate of the ratio, symbolized by "r" -- expressing the relationship between recurrent expenditure in a year of normal operation and the sum of development expenditures, in constant prices but undiscounted -- for an international sample of projects (Table 2.1)[2].

Part Two of the present report summarizes whatever evidence was gathered in the case studies and sector reports concerning the level of the r -coefficient in different projects and sectors. Calculation of the coefficient turned out to be particularly ambiguous in the case of agricultural and integrated rural development projects, for the reason that few of them have yet reached a stage of normal operation. This has made it particularly difficult to decide how many years of non-recurrent or development expenditure to include in the denominator.

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[1] Above, Chapter I, Section I.1.

[2] It may be noted that this is the same type of coefficient as that used by Beazer, Burstein, and Pulley in their effort to project the net fiscal deficit associated with a hypothetical investment program in the Sahel. (Above, Chapter I, Section I.3.)

TABLE 2.1

Sectoral recurrent cost coefficients (r) estimated by P. Heller

	Sector	r
I.	Agriculture	
	Fisheries	0.08
	Forestry	0.04
	General agriculture	0.10
	Livestock	0.14
	Rural development	0.08 - 0.43
	Veterinary services	0.07
II.	Buildings	0.01
III.	Education	
	Agricultural college	0.17
	Polytechnic schools	0.17
	Primary schools	0.06 - 7.0
	Secondary schools	0.08 - 0.72
	University	0.02 - 0.22
IV.	Health	
	District hospitals	0.11 - 0.30
	General hospitals	0.183
	Medical auxiliary training school	0.14
	Nurses college	0.20
	Nutrition rehabilitation unit	0.34
	Rural health centers	0.27 - 0.71
	Urban health centers	0.17
V.	Housing	0.03
VI.	Manufacturing, commerce, and construction	0.01
VII.	Roads	
	Feeder roads	0.06 - 0.14
	Paved roads	0.03 - 0.07
VIII.	Social and rural development	0.04
IX.	Tourism	0.05

Source: P.S. Heller,"The Underfinancing of Recurrent Development Costs", Finance and Development, March 1979, p.39.

Questions also arise with respect to the operational significance of "r" in the case of rural development projects, considering the heterogeneity of the functions carried out in such projects. If on the other hand one tries to calculate r's for separate functions, one is confronted with the problem of allocating general development costs among the different functions. Consider, for example, a project that includes both irrigation development and extension; how is the non-recurrent expenditure corresponding to purchase of trucks during the establishment phase to be allocated to the denominator for the r - coefficient of each function?

Moreover, in some cases problems arise in estimating the value of the denominator of the ratio, i.e., the sum of development costs. In such cases we have used a coefficient giving recurrent costs per physical unit of capacity--kilometer of road, a single borehole, a fattened animal, etc.

The chapters in Part Two of the report not only present estimates of "r" for a set of projects and sectors in the Sahel, but also offer suggestions with respect to their use in future economic and financial planning exercises in the region. At the same time it is obvious that using an r-coefficient to estimate a project's recurrent costs will normally involve a lesser degree of accuracy than a detailed analysis of the different cost components peculiar to the project in question. It should also be noted that minimization of the recurrent cost coefficient is anything but a valid objective in project selection, notably because its calculation ignores any considerations of socio-economic or financial return.

II.8 Project revenues and recurrent cost recovery

To calculate recovery of a project's recurrent costs one estimates the amount of government receipts, in cash or kind, direct or indirect, which are generated as as result of the project's existence, regardless of whether the receipts in question return directly to the project.

The ratio between the total of such receipts and total recurrent costs during a year of normal operation of a particular project gives us the recurrent cost recovery coefficient. The value of this coefficient may be less than, equal to or greater than unity -- the latter applies to projects that generate public revenues in excess of the recurrent costs associated with them.

The central problem here is to identify those receipts which are attributable to the project's existence. The "Effects Method" (méthode des effets), developed by the French economists Chervel and Le Gall[1], endeavors to derive such estimates. The Effects Method consists of examining the chain

[1] M. Chervel and M. Le Gall: Manuel d'évaluation des projets: la méthode des effets, série Méthodologie de la Planification, Ministère de la Coopération, Paris, 1976.

of production and distribution starting from the project under review up to the final stage of sale of the product in question for private consumption and/or export. At each point in the chain, one identifies the economic agents involved and measures value added as well as corresponding fiscal receipts, direct and indirect. Taking the example of an agricultural development project, the following are considered to be receipts due to the project according to this method:

i. export and/or sales taxes on output;
ii. import duties, sales taxes and excises on material inputs used in operation and maintenance of the capacity created by the project, as well as in the transportation, processing and marketing of output;
iii. indirect taxes on consumption items purchased by participants in the production and distribution chain out of disposable income which they receive as a result of their participation;
iv. direct taxes on personal and company income attributable to the project and downstream activities linked with it.

Application of the Effects Method is subject to abuses of which its authors are fully aware and to which they draw explicit attention in the methodological document cited in the preceding footnote. For example, in the case of a food crop production project the method calls for attributing to the project, among other things, only part of the income taxes paid by private intermediaries responsible for marketing the harvest--namely, the difference between the total of this revenue given the project, and the taxes that would have been paid, had the project not come into being, on account of distribution of imports of substitute products. If one fails to take account of the exact instructions given by the method's authors one runs the risk of erroneously attributing to the project total taxes paid on income associated with distributing its products, which would involve double counting. Another abuse of the Effect Method is to double count, when calculating independently the revenue impact of each of several associated projects, proceeds that are only attributable to them jointly. The same food crop production activity leads to an increase in road traffic on account of transporting the harvest; the truckers pay a fuel tax on purchasing their gasoline; and the logic of the method leads us to include the proceeds of this tax in the amount recovered by the agricultural project. The danger is that the Ministry of Public Works will attribute the same fu

tax proceeds to road construction and maintenance projects. Thus, overall, we are likewise faced with double counting of the receipts.

As emphasized above, in calculating the recurrent cost recovery coefficient it is essential to include all receipts generated as a result of the project's existence, even if none or only a part of the amount realized returns explicitly to the project. As will be shown below, various types of projects generate public revenues that flow into the central Treasury without necessarily returning to the project where they, in effect, originated. Only part of the receipts from stump taxes levied on forest projects returns to Forest Funds (where these exist); receipts from livestock marketing taxes do not necessarily benefit livestock projects.

On the other hand, not all receipts earmarked for financing particular projects necessarily enter in the numerator of the projects' cost recovery coefficients. Assume a beer tax whose proceeds are earmarked, by government decree, for payment of teachers' salaries. In this case it would be inappropriate to count the beer tax receipts in total receipts due to the existence of primary schools, regardless of how much the latter benefit from the tax to finance their recurrent costs.

Finally, while the recurrent cost recovery coefficient may be a useful indicator of a project's impact on government finances, maximization of the coefficient can in no way be considered an alternative criterion of project selection to replace the traditional internal rate of return or net present value criteria. In the limit such a practice could lead to rejection of any primary education activity in a society aspiring to provide free primary education to the majority of the population.

II.9 Recurrent costs and the notion of optimality

We referred earlier to the ambiguity that attaches to the DAC's concept of recurrent expenditure as that "required" for operation and maintenance of productive capacity, inasmuch as many alternative forms and intensities of utilization and maintenance are possible for a given unit of capacity.

The Working Group interpreted the concern underlying the present study as being to identify ways and means of insuring that capacity created via development projects is utilized and maintained optimally in the light of overall development objectives for the Sahel. This is quite different from ensuring that all capacity is operated and maintained in rigid conformity with original project design, since the design may not have been optimal to begin with, and the optimal pattern of operation and maintenance is likely to evolve with changing economic circumstances during the project's lifetime.

The Working Group proceeded on the premise that each country's fundamental objective is to maximize the social net present value (of national production or consumption) obtainable from efficient utilization of all available resources. Among other things this means that, for all activities, the contribution of the last unit of resources allocated to each activity should be equal: for if this is not the case, it is always possible to transfer a unit of resources from one activity to another and thus increase social welfare as measured by the present value of national output or consumption. The contribution to social welfare of the last unit of resources allocated, is itself called the

marginal social benefit.

Taking account of the foregoing fundamental objective, two series of phenomena may cause planned operation and maintenance to diverge from their optimal level: firstly, changes in the interrelationships of factors internal to a project, and secondly, changes in returns to productive factors employed within a project vis-a-vis returns which they could obtain in other projects or sectors.

Changes in relationships of factors internal to a project. Three cases deserve mention here:

i. the project application or appraisal document may have indicated relationships among inputs and outputs overestimating the productivity of the former (for example, one may expect too much, in terms of crop yields, from improved seeds). Project expenditures were planned in accordance with the expected yields (purchase of fertilizer, number of agricultural workers to be paid, etc). Maintaining such expenditures at the planned level would inevitably lead in such a case to a fresh waste of budget resources.

ii. some projects are designed using technological standards in effect in the donor country but not so well suited to Sahelian country factor proportions. Discrepancies in this regard may bring about a pattern of utilization and maintenance of capital that is either more or less intensive than characterizes the situation in a donor country. More intensive because capital is relatively scarce in the Sahel. For example, in the case of primary education, Sahelian countries may consider that, given the scarcity of qualified personnel (teachers) and inadequacy of school buildings and equipment, it is preferable, in order to attain the planned enrollment level, to increase class size beyond what would be acceptable in donor countries. This would lead to an increase in recurrent costs of operation and maintenance which would thus substitute themselves for increased investment in school infrastructure. On the other hand, capacity utilization may be less intensive

due to constraints which the project planners had not foreseen: insufficient management personnel, interruptions due to a shortage of spare parts , etc.; and

iii. relative prices of factors and inputs may change from those anticipated in the project design, modifying the choice of factor combinations and inputs utilized in operation and maintenance. For example, following an increase in the petroleum price, it becomes relatively more expensive to operate and maintain road maintenance equipment. Accordingly, it may be decided, contrary to initial plans, to expand as far as possible the use of labor-intensive methods in grading gravel roads.

Changes in returns to factors as among different uses. In section II.4 above, we saw that the economic or opportunity cost of employing a unit of resources in a given project is the benefit which the same unit could have generated in alternative uses. Changes in economic conditions -- budget stringincy, or a change in the relative priority accorded by government to one sector or program as opposed to others -- may modify this opportunity cost. For example, with the onset of an epidemic, the economic (or opportunity) cost of maintaining roads increases, given that the resources allocated to it would contribute more to social welfare if they were transferred to control of the epidemic. This also represents a modification in the initial program, which had not foreseen such a siphoning-off of resources.

The study of individual projects presented in Part Two of the report not only examines possible divergences between planned and optimal levels of operation and maintenance, but also seeks to furnish useful indicators for estimating optimal levels in the case of projects whose form is not yet a fait accompli.

The earlier in the process of project design one initiates the task of programming recurrent expenditures, the fewer the constraints that limit one's choice of an optimal expenditure path. No matter where one starts, however, the appropriate procedure is a two-stage one:

First, maximize economic net present value; secondly, find the recurrent expenditure path that minimizes financial present value cost. This procedure should be repeated at different levels of aggregation and at different points during the ensuing implementation of each project. It is clear that, in the context of applying such a programming model, explicitly or implicitly, use of naive rules for project selection such as minimizing the recurrent expenditure coefficient or maximizing the cost recovery coefficient are no better guides to optimization of new project design than rigid conformity to original design is synonymous with optimizing project execution.

The concept of optimality is also relevant to cost recovery. Government activities produce either private benefits or public goods or a combination of both. Optimality in cost recovery differs according to the relative proportions of these two components in the outcome of public sector activity.

A public good is a good or service such that: (a) the enjoyment of its benefits by one or more members of society in no way impedes similar enjoyment by any other member(s) and (b) no member of society can be excluded from enjoyment of such benefits regardless of whether or not he has shared in the burden of producing the good or service. The classical example is national defense -- no individual's satisfaction over being protected from foreign military intervention diminishes the same satisfaction enjoyed by other persons, nor can anyone be prevented from enjoying it if he fails to pay his taxes.

In contrast, a good or service generates private benefits if its consumption by an individual reduces the amount available for consumption by others (for example, foodstuffs). Thus it is generally argued that the consumer of a good conferring private benefits should provide something in exchange from his personal means (i.e. pay a price), while production of public goods should be financed by the government without relying on procedures of direct cost recovery from the beneficiaries. The price to be paid for private goods produced within the framework of public sector projects can be determined on the basis of either marginal cost -- the increment in total production cost associated with producing an additional unit of output -- or full cost -- marginal cost plus

operating and maintenance costs, including depreciation, of the government agency involved in the project. As will become apparent in the analysis of sectors and projects in Part Two of the report, the concepts of public goods and private benefits, as well as those of marginal and full cost, are basic to any discussion of improved cost recovery measures.

Moreover, the distinction between the so-called "directly productive" sectors -- agriculture, livestock, fisheries, etc., -- and the social sectors -- education, health -- is based on the presumption that the former produce mainly private benefits while the output of the latter contains an important component of public goods. On the other hand, the benefits associated with directly productive activities are not exclusively private. Thus, insofar as society as a whole perceives satisfaction from improved nutrition on the part of its less fortunate members, increased food production which goes towards meeting this basic human need generates a public good.

Finally, it is clear that the method of cost recovery employed -- payment of user charges, earmarked taxes, etc. -- has a significant impact on a country's efficiency in its use of scarce resources as well as the degree of equity in the distribution of these resources among different classes of the population and regions of the country. This impact must be taken into account in offering recommendations for resolving the recurrent cost problem.

PART TWO

FINDINGS OF THE STUDY OF SECTORS AND PROJECTS

Chapter Three: THE CHOICE OF SECTORS AND DEVELOPMENT PROJECTS

III.1 The sectors

Analysis of recurrent costs was carried out with respect to eight sectors:

1. Agriculture(rain-fed and irrigated agriculture, crop protection, marketing): Chapter IV
2. Rural water supply: Chapter IV
3. Livestock: Chapter V
4. Fisheries: Chapter VI
5. Forestry: Chapter VI
6. Transport infrastructure: Chapter VII
7. Education: Chapter VIII
8. Health: Chapter VIII

These eight sectors are considered as having priority in the strategy of Sahelian development.[1] Thus, they embrace the entire First Generation Program (1978-1982) for whose financing more than $US 3 billion (1977 prices) has been requested from the donor community.[2] If the Sahelian countries accept medium- and long-term responsibility for operating and maintaining projects established with the foreign aid provided in the framework of this program, it will be in these sectors that the problem of recurrent costs will arise a priori. The terms "if" and "a priori" are significant here: as our analysis will bring out, at the present time the Sahelian countries face a margin of choice, sometimes considerable, as to whether or not to charge their national budgets with underwriting the operation and maintenance of some of these sectors or the subsectors that constitute them. Moreover, in other cases, even if the government decides to shoulder future

1 See above, Chap. I, Sec. I.2.
2 Ibid., also Table 1.2.

responsibility, this does not necessarily impose an intolerable burden on the national budget, considering the real possiblities that exist for improving cost recovery procedures and/or criteria for allocating foreign aid.

In seven of the eight sectors, the exception being transport infrastructure, the data required for the analysis were obtained principally by studying 29 development projects(see below, Section III.2). In the case of the transport sector, it was considered more appropriate to take a global approach which consisted of examining technical, financial and administrative problems arising at the level of maintenance of the respective countries' national transport networks. In some of the sectors, more or less effort was devoted to linking the lessons drawn from studying the operation and maintenance of projects (and transport networks) to additional evidence obtained from analyzing sectoral budgets of the national government (agriculture, livestock, education, etc). For some sectors, particularly agriculture and human resources (education, health), it proved necessary to refer immediately -- i.e. without awaiting the lessons of the macro as distinct from sectoral analysis -- to the Sahelian countries' choices and models of socio-economic development. Here the distinction between sectoral and macro analysis, while perhaps useful for expository purposes, does not hold up under practical examination.

III.2 The development projects

The 29 development projects chosen are grouped by sector in Table 3.1.

In choosing the projects an attempt was made to follow three criteria:

i. The project should be sufficiently representative of what is being done (or will be done) in the sector;
ii. The project should have attained its phase of normal operation;
iii. Availability of project data.

TABLE 3.1

The 29 development projects grouped by sector

Sector and projects	Country	Type of project	Principal products (if relevant)
I. Agriculture			
Integrated development of the Southern Zone	CHAD	Multi-faceted	cotton
Peanut and Foodcrop Project (OACV)	MALI	Multi-faceted	peanuts, foodgrains
Office du Niger		Irrigation in central delta of Niger River	rice
Irrigation Development (AHA)	NIGER	Irrigation in the Niamey region	rice, cotton, foodgrains
Maradi Productivity Project		Integrated rural development	peanuts, millet, niébé
National Cereals Plan		Multi-faceted with emphasis on selection and multiplication of seeds	millet, niébé, sorghum
Crop protection		Dissemination of pesticides	protection of cereal crops
Sédhiou Rural Development	SENEGAL	Integrated rural development	rice
Siné Saloum Project		Multi-faceted	peanuts
Bakel Small Irrigated Perimeters		Small-scale irrigation	rice, corn, sorghum, niébé
Volta Valley Development (AVV)	UPPER VOLTA	Land settlement	cotton, millet, sorghum, corn
West Volta Agricultural Development		Integrated rural development	foodgrains, cotton
2nd Rural Development Fund (FDR)		Small-scale infrastructure	foodgrains, cotton

Table 3.1 cont'd

Sectors and projects	Country	Type of project	Principal products (if relevant)
II. Rural Water Supply			
Program of the Water-Supply Equipment Corporation (SOMH)	SENEGAL	Rural boreholes (motorized pumps)	establishment and management of 85 boreholes (1979)
III. Livestock (3)			
Mopti Livestock Development Project (ODEM)	MALI	Semi-extensive pastoral operation	livestock
Smallholder cattle ranching credit and investment project	MALI	Fattening of cattle on feed-lots	livestock
Project of the Company for Livestock Development in the Sylvo-Pastorale Zone (SODESP)	SENEGAL	Semi-extensive pastoral operation	livestock
IV. Fisheries			
Mopti Fisheries Project	MALI	Integrated development	fish; product protection, training
Fishing Boat Motorization Project	SENEGAL	Equipment maintenance and technology transfer	fish, engine maintenance services
V. Forestry			
Artificial forest plantation project (Dagouma, Dinderesso, Gonsé)	UPPER VOLTA	Wood production and protection of the environment	firewood and lumber
Artificial forest plantation project (Bamako region)	MALI	Wood production and protection of the environment	firewood and lumber

TABLE 3.1 cont'd

Sectors and projects	Country	Type of project	Principal products (if relevant)
VI. Transport Infrastructure (0) see text commentary			
VII. Education (3)			
National School of Medicine, Dentistry and Pharmacy	MALI	Highly specialized training	doctors, dentists, pharmacists
Rehabilitation of primary and middle schools	NIGER	Rehabilitation of school installations	rehabilitation of primary and middle school buildings
Rural education	UPPER VOLTA	Relating of schooling to rural needs	rural education services (literacy and vocational skills)
VIII. Health (5)			
National primary health care program	NIGER	Training of health workers and provision of care	
Four primary health projects (Pikine, Gossas, Fatick, Siné-Saloum)	SENEGAL	Training of health workers and provision of care	

Note: each of the sectoral chapters provides additional details concerning the nature of these projects.

On the other hand, a " country" criterion -- choosing at least one project in each Sahelian country -- was not employed, inter alia at the express wish of the national delegates to the study within the Working Group. In effect, it was felt more useful to let the other three criteria prevail -- and principally criterion(i) -- inasmuch as the concern was not to carry out ex post evaluation of certain projects within the various countries, but rather to utilize the most representative possible sample in order to advance our knowledge of the problem area of recurrent costs and their recovery in the Sahel. Thus, for example, it was felt that the fishing boat motorization project in Senegal might carry lessons for similar operations which one might want to establish in The Gambia and Mauritania . Also, evidence collected in regard to the cost of the medical school in Mali was felt to be useful for other countries in the region that might ask themselves about the desirability of creating national institutions of highly specialized training.

Nevertheless it must be admitted that the three selection criteria showed themselves a posteriori to have been applied with varying degrees of success in some of the projects chosen and certain of the sectors analyzed.

The application of criterion(i) (representative of what is going on in the sector) did not encounter too much difficulty. To be sure, due to lack of time and resources, in the case of the health sector we were obliged to omit a priority segment within the CILSS' First Generation Program, namely, the Expanded Program of Immunization, in order to concentrate available energy on the analysis of primary health care projects, another important segment of the Program.

Our discussion in Chapter VIII of characteristics of the health sector in general will, however enable the reader to anticipate certain conclusions which might have been drawn from an analysis of the immunization subsector. Livestock operations are limited to activities in the Sahelian zone (Mali, Senegal) whose problems are likely to differ from those of the Mauritanian livestock industry, located principally in the Saharan zone. This is partially compensated for by observations drawn from meetings which the consultant responsible for this sector had with livestock authorities in Nouakchott, as well as those arising from his analysis of the Mauritanian animal health budget.

Perhaps a more serious issue in application of criterion (i) is the fact that a project's success in operating and maintaining its installed capacity depends not only on adequate financing, but also on a set of human and physical factors of whose distribution one cannot be certain a priori. While the varying performance levels of the forest projects included in the sample may be partly due to variations in economic conditions and internal management from one project to another, other environmental elements should not be ignored in explaining performance -- different population densities, heterogeneity of soil conditions in the plantations, etc. It is obvious that, given the limited nature of our sample of these projects, it in no way exhausts the range of situations existing in the region.

Application of criterion (ii) (normal operation) posed more serious problems. In the case of several projects -- particularly but not exclusively in the agricultural sector -- which were thought initially to have attained normal operation, it turned out after closer examination on the ground that this was not true for the entirety of the project, certain important components still finding themselves at the stage of establishment, even experimentation. By the time these situations became clear to the Working Group's consultants, the process of investigation was too far advanced to warrant considering dropping these projects from the sample. They have therefore been retained. At the same time, these projects made it possible, among other things, to give a more concrete character to certain suggestions with regard to conditions that development projects in the Sahel should fulfill in order to be assured from the beginning of viability in the long run.

With respect to the application of criterion (iii) (availability of data), as is common in empirical research, in a number of cases the data available were of poorer quality than had been anticipated. Furthermore, at the stage of preparing sectoral syntheses data obtained from different projects in the same sector have proven difficult to compare, whether from the viewpoint of the price assumptions used or with respect to the reliability of the numbers obtained. At the same time it should be stressed that the lack of reliable quantitative information was often compensated by the fact that the Group's consultants were able to visit sites of most of the projects. On the occasion of such visits, they were able to benefit from a considerable fund of information which, if not always subject to rigorous translation into figures, at least made it possible to refine the analysis and findings therefrom. In this connection we acknowledge, with gratitude, the willing cooperation provided in this regard by Sahelian project managers and technicians. Another element which enabled us to compensate for lack of available data at the project level was the availability of information at the headquarters of a number of international aid agencies active in the Sahel.

The project analysis benefitted at the outset from a methodological doucment whose basis was laid by a discussion of the Working Group at Ouagadougou in February, 1979[1]. This document recommended that the consultants responsible for project studies specify the nature and importance of recurrent costs not only for the project as a whole, but insofar as possible for each of its functions; measure the impact of inadequate financing of these costs on the rate of implementation of the project and its components; and focus on the project's relations with the rest of the economy so as to be able to better assess possibilities of cost recovery at different stages of the production and distribution chain.[2] The consultants had varying degrees of success in fulfilling these tasks; in any case the document was not imposed on them as a straightjacket, but rather, as its title indicates, comprised a set of guidelines. Particularly with respect to the social sectors the research methodology had to be developed afresh, since the February 1979 document was influenced particularly by the context of directly productive activities, specifically arable agriculture.

[1] "Guidelines for the Study of Development Projects", February 20, 1979, mimeo.

[2] Above, Chapter II, Section II. 8.

The reader will thus have difficulty finding, in the five sectoral chapters that follow, a uniform approach to each sector. The sectors are very different from one another, not only with regard to the nature of the output-- millet, fish, firewood, health services, etc. -- but also with respect to the economic character of these goods -- private vs. public goods.[1] Thus, a cattle vaccination campaign may be closer to a rural literacy program than to a project for marketing the same livestock when it comes to suggesting procedures for cost recovery. In any case, the approach followed with each sector made it possible to offer what we believe to be a useful synthesis meeting the concerns expressed in Section I.5 of Chapter One, under the heading,"Principal questions." This sectoral synthesis is the subject of Chapter IX.

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[1] See particularly the discussion introducing the education and health sectors (below, Chapter VIII, Section VIII.1).

Chapter Four: AGRICULTURE AND RURAL WATER SUPPLY

IV.1 The concept of recurrent costs in agricultural development projects in the Sahel.

The principal characteristics of the 13 agricultural development projects selected for case studies are given in Table 4.1. Three of the operations are irrigation schemes, one is a land settlement program, one involves dissemination of a single category of agricultural input (insecticides) while the other eight represent multi-faceted, multi-crop development programs focusing on particular regions of a Sahelian country. Several of the eight are described as "integrated rural development projects" in the sense of embodying some allocation of resources to social services such as literacy promotion and primary health care.

The normal operation of the 13 projects involves (or will involve) implementation of one or more of ten categories of functions, expenditure on which is traditionally considered "recurrent" in nature:

I. General project administration

II. Maintenance and, where relevant, operation of physical infrastructure

- Irrigation works--dams, canals, pumping stations
- Water supply--wells, boreholes
- Transport infrastructure--roads, desert tracks
- Buildings--offices, warehouses, markets and shops, training institutions, community centers, staff houses

III. Basic and applied research[1]

- Plant breeding, seed selection
- Testing of inputs and techniques
- Operation of pilot farms

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[1] For technical reasons agricultural research embodies characteristics of a recurrent nature: the development of improved seeds and input packages is a quasi-continuous process.

TABLE 4.1: Sample of 13 agricultural development projects in the Sahel -- principal characteristics

	Chad	Mali		Niger				Senegal			Upper Volta		
	Integrated development of southern zone	Office du Niger	Opération Arachide et Cultures Vivrières (OACV)	Aménagements Hydroagricoles (AHA)	Maradi Rural Development	National Cereals Plan	Crop Protection	Bakel Small Irrigated Perimeters	Sédhiou Rural Development	Sine Saloum	Aménagements des Vallées des Volta (AVV)	Second Rural Development Fund	West Volta Agricultural Development
uthor of case study	Thénevin	Marteau, Swala, Kessous	Bah	Funel, Lemelle	Schneider	Lassana, Martens	Sy	Schneider	Schneider	Mérdil, Bosshardt	Richer, Sorgho	Schneider	Schneider
gency of author	FAC	CRDE CILSS	BARA	SEDES FA	HIID	CRDE	CRDE	HIID	HIID	CCCE/ SEDES	CCCE/ CILSS	HIID	HIID
onor agencies involved	FAC, FED	France China	IBRD, FAC	FAC, FED	IBRD	USAID	CIDA	USAID	IBRD	IBRD, CCCE	IBRD, UNDP	IBRD	IBRD
itial year of investment	1972	1932	1972/73	1960	1977 (fiscal year)	1975	1969	1977	1973, 1976 (fiscal years)	1972	1974	1977 (fiscal year)	1977 (fiscal year)
pe of project	Multi-faceted	Irrigation	Multifaceted	Irrigation	Integrated rural dev.	Multi-faceted	Dissemination of insecticides	Irrigation	Integrated rural dev.	Multi-faceted	Land settlement	Small-scale infrastructure	Integrated rural dev.
jor crops	Cotton	Rice, sugar	Groundnuts, cereals	Rice, cotton, cereals	Groundnuts, millet, cowpeas	Millet, sorghum, niébé	Millet, sorghum, niébé	Rice, maize, sorghum, niébé	Rice	Groundnuts	Cotton, millet, sorghum, maize	Cereals, cotton	Cereals, cotton
oject components													
II. Infrastructure													
irrigation		x		x	x			x	x		x	x	x
water supply											x	x	
transport			x								x		
buildings	x				x						x	x	x
II. Research	x		x		x	x	x						
IV. Supply of inputs													
fertilizer	x		x	x	x	x	x		x	x	x		x
seed multiplication and/or distribution	x	x	x		x	x			x	x	x	x	x
equipment	x		x		x	x			x	x	x		
pesticides	x								x				x
V. Agricultural credit			x		x	x	x		x	x			
VI. Marketing of output													
Purchase & collection from farmers		x	x	x		x		x					
Assembly, storage & shipment	x	x		x		x			x			x	x
Processing		x							x				
II. Institutional & capital development													
Extension	x				x					x	x		x
Staff training						x			x				x
Cooperatives					x			x	x			x	
Literacy programs			x		x				x		x		x
II. Land settlement									x		x		
IX. Evaluation			x		x				x	x	x	x	x
X. Complementary activities													
Animal health			x		x				x		x		
Community health			x								x		
Education					x								
Rural Artisanry			x		x								

IV. Supply of inputs

Seed multiplication and distribution

Distribution of:
Fertilizers
Pesticides
Cultivation equipment (including animals)

V. Credit

Seasonal credit for current inputs and subsistence
Medium-term credit for land development and equipment
Working capital for distribution of inputs & output

VI. Marketing of output

Purchase and collection from farmers
Assembly, storage and shipment
Processing (cotton ginning, peanut and rice milling, etc.)

VII. Institutional and human capital development

Extension services
Formation, promotion and supervision of cooperatives
Staff training
Literacy training

VIII. Follow-up to land settlement

IX. Evaluation of project implementation

Agronomic
Socio-economic

X. Complementary activities (attributable to other sectors)

Animal health services
Community health care
Education
Promotion of rural artisanry

On some projects, certain of these activities are carried out by private economic agents; in other cases the state intervenes, sometimes massively, via specialized agencies. As we saw in Chapter Two, where public sector agencies handle quasi-commercial operations such as initial processing, transport, etc, only the net operating deficits (if any) constitute a recurrent expenditure for the government.

In several of the projects the government ensures the supply to farmers of agricultural inputs at subsidized prices. This practice poses a special problem in recurrent cost analysis of agricultural projects. Subsidies may be provided for a limited period only, to induce farmers to adopt new input, e.g. pesticides, in which case they correspond by our definitions to non-recurrent or development expenditure. On the other hand, if continuance of a subsidy into the foreseeable future is considered necessary in order to attain a project's production target, it appears to become an item of recurrent expenditure.

In the latter situation it does not necessarily follow that the entire amount of the subsidy -- i.e. the difference between market and subsidized prices -- should be counted as an item of recurrent expenditure; one must first consider how the subsidy is financed. For example, in the case of cash crops such as cotton and peanuts, the government frequently levies an export tax. Alternatively, it may appropriate profit margins associated with transport and marketing of the harvest. In such cases only the net amount of the subsidy, i.e. the gross subsidy less export tax receipts and profit margins perceived by the government, should be included in a project's recurrent expenditure. The rationale for this procedure is that the project would achieve the same production target if the farmers received a higher producer price -- e.g., one close to the world market price -- in lieu of subsidies for purchase of inputs.[1]

Estimated recurrent expenditures of ten of the 13 agricultural development projects are given in table 4.2.

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[1] This statement must be qualified insofar as the combined incentive and disincentive effects of the higher prices would affect different producers in different degrees. The net impact could be either to decrease or increase total output.

TABLE 4.2: Estimated/projected recurrent and non-recurrent ("development") expenditure and "r"-coefficients in sample of 12 agricultural projects in the Sahel

(All figures in millions of francs CFA except for two Mali projects -- OACV = FM millions, Office du Niger = FM/ha. Unless otherwise indicated in notes, all figures in current prices of indicated year(s).)

(1) Country	(2) Project	(3) Author(s) of case study reports	(4) Annual recurrent expenditure after project completion	(5) Cumulative non-recurrent ("development") expenditures during planned project establishment period	(6) Implicit "r"-coefficient (4)/(5)	(7) Sources--page nos. in case reports: Recur. costs	(8) Sources--page nos. in case reports: Non-recur. costs
			a) including input subsidies b) input subsidies excluded/not applic.				
Chad	Opération de développement rural intégré en zone Sud ("Plan Coton")	Thénevin	a) 3,111 b) 365	a) 11,118 } (1972- b) 6,968 } 1977)	a) 0.28 b) 0.05	pp.55-56	p.7 p.5

NOTE: Rec. expend. estimated for 1977, planned as "break-even" point. Non-recurr. expend. taken from project financing plan. Alt. (B) is net of subsidies for fertilizer and insecticides. Case study report argues input subsidies are not "true" recurr. costs since they are more than offset by government's margin on cotton exports.

Mali	Opération arachide et cultures vivrières (OACV)	Bah	b) 2,626	b) 6,546 (1973/73-1977/78)	b) 0.40	p. 37	p.16

NOTE: Rec. expend. is actual for 1977/78, excluding depreciation of capital assets. May include a small amount of subsidized inputs (but not fertilizer). Non-recurr. figures are actuals. Case study report (pp. 47-48) projects "explosion" of rec. costs based on current trend, implying "r"-coefficient close to 2.0 in 1983/84.

(TABLE 4.2 cont'd)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mali	Office du Niger	Martens/ Sorgho/Kessous	b) FM46,566-63,905 per irrigable hectare	Not available	--	pp.21, 23	--

NOTE: Rec. cost figure is project management's est. (1978) of desirable expenditure on maintenance. Actual 1976/77 expenditure was only 1-2% of estimated range. Since "development" expenditure has been carried out since 1932 its reconstruction here would be highly conjectural.

Niger	Aménagements hydro-agricoles (AHA)	Funel/ Lemelle	b) 266	b) 5,500 (1960-1978)	b) 0.05	pp.60, 114	pp.138-150

NOTE: Rec. expend. based on 1978 actuals, adjusted for lumpiness of major repairs. To preserve comparability with other cases, case study's estimates of public agency O&M expend. in distrib. chain above AHA level are excluded here. Non-rec. expend. figure derived from authors' reconstitution of expenditure data on project components, and is incomplete. Authors' estimate of current unit replacement cost is over 4 times as high.

Niger	Maradi Rural Development Project	Schneider	a) 599	(see note) (1977-79)	a) 0.25	p.17	--

NOTE: 1976 prices. Rec. expend. is estimate based on adjustments to IBRD appraisal report data. Input subsidies account for less than 10%, which case study report doubts govt. can recoup in distribution stage. Report's computed "r"-coefficient implies non-rec. expend. of approx. 2,400.

Niger	Plan Céréalier National	N. Essema	b) 281	a) 1,343 (1975/76-1978/79)	b) 0.21 (max.)	p.5	p.5

NOTE: 1978 prices. Rec. expend. est. excludes extension services, distribution of inputs and grain marketing on assumption only research and seed production/multiplication activity must be continued once project is established. Non-rec. figure includes minor allowance for input subsidies.

(TABLE 4.2 cont'd)

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Niger	Crop Protection	A. Sy	b) 1012	not available	not available	pp.40,41	not available

NOTE: Comprises expenditures of national Crop Protection Service and local authorities. Project establishment having covered several stages beginning in 1969, estimation of non-recurrent expenditures is a matter of conjecture.

Senegal	Sédhiou Rural Project	Schneider	a) 524	(see note)	(1976/77-1979/80) a) 0.16	p.30	--

NOTE: 1976 prices. Rec. expend. is estimate for 1979/80 based on adjusted appraisal data. Input subsidies account for 11%, not recoverable in distribution stage. Report's computed "r"-coefficient implies non-recur. expend. of approx. 3,200.

Senegal	Siné-Saloum Project	Bénédic/ Bosshardt	b) 460	b) 6,963 (1975-80)	b) 0.07	p.38	p.13

NOTE: Rec. expend. represents estimate of "maintenance" activity in 1978/79 in current prices. Non-rec. figure is planned total project financing in 1975 prices including some allowance for inflation.

Upper Volta	Aménagement des Vallées des Volta (AVV)	Richet/ Sorgho	a) 1,285-1,645 b) [illegible]35-1,145	a) 30-50 billion b) not available	a) 0.03-0.05	pp.20-21	p.17

NOTE: 1977 prices. Data based on appraisal estimates for 20-year project comprising settlement of 15,000 families (of whom 1,200 had been settled by the end of the 1978/79 crop year). Max. est. reflects denser extension-staffing--1 agent/25 families and 1 animatrice/75 families versus 1/75 and 1/150, respectively, for minimum estimate. Report considers input subsidies to be covered by cotton export margin (p.35).

(TABLE 4.2 cont'd)

(1)	(2)	(3)	(4)	(5)		(6)	(7)	(8)
Upper Volta	West Volta Agricultural Development Project	Schneider	a) 575 b) 359	a) 3,505 b) 3,003	(1977-81)	a) 0.16 b) 0.12	p.39 p.38	p.39 p.38

NOTE: 1976 prices. Rec. expend. is estimate for 1981 based on adjusted appraisal data. Value of input subsidy exceeds value of incremental production, hence cannot be regarded as covered by cotton export margin.

Upper Volta	Second Rural Development Fund	Schneider	b) 307	b) 2,961	(1975/76-1979/80)	b) 0.10	p.16	p.16

NOTE: 1978/79 prices. Rec. expend. is estimate for 1979/80 based on adjusted appraisal data.

In the case of agricultural development projects, the concept of recurrent expenditure, and thus its measurement, depends critically on what is meant by installed capacity . As shown in Chapter Two, the distinction between current and investment expenditure is an imperfect representation of the distinction between recurrent and nonrecurrent expenditure. Thus, estimation of the recurrent cost coefficient , r , is dependant on a careful analysis of the period required for project establishment, the denominator of this coefficient comprising the sum of all expenditures carried out during this period, whether capital or current in nature.

For purposes of the present chapter, the question becomes: when can an agricultural project be said to have become established? To answer this question we look at the character of agriculture as a directly productive sector, producing tangible goods for domestic consumption and/or export. In this connection, an agricultural development project obtains its stage of normal operation at the point where sales proceeds cover expenditures, whether undertaken by the peasant -- purchase of goods and services-- or by the State (maintenance of physical infrastructure and equipment, extension, research, subsidies, etc.).

At the same time, the complexities of the Sahelian situation call for a margin of tolerance with respect to the principle that agricultural development project receipts should cover government expenditures under conditions of normal operation.

Agriculture in the Sahel involves the major part of a population living at a near-subsistence level. In addition, it supplies the most important component of the consumption basket of the urban population -- government officials, artisans, industrial and service sector workers. An adequate supply of agricultural products at "reasonable" prices is thus essential to maintain their real living standard. Employment opportunities in directly productive activities outside agriculture have increased in recent years, in the Sahel, at a relatively slow rate in relation to population growth. Thus, improvement of Sahelian welfare is linked, at least in the medium term, to the possibilities that exist for rural sector income to increase more rapidly than population. Under these conditions, it is legitimate to ask whether Sahelian agriculture plays not only an economic role, but also, and perhaps even more significantly, a social role, justifying government allocation, at least for a few more years, of part of its budget resources to operation

of the sector.

The Working Group's case studies have brought into sharp focus the nature of most of these projects as true ventures in "social engineering", depending for success on the development of improved agricultural varieties and/or cultural techniques, which must then be transmitted to a peasantry living so close to the margin of survival as to make it unavoidably resistant to their adoption, owing to the high level of risk associated with their experimental character. The success of the project under ecological and sociological conditions characteristic of smallholder agriculture require that most of the functions listed above be conducted over a sufficient number of years to generalize the new systems and provide them with a certain guarantee of viability.

On the one hand the peculiar nature of agricultural development projects in the Sahel calls both for a longer establishment phase than has generally been provided for up to now and for maintaining a certain level of government support during the stage of normal operation. At the same time one should not overlook possibilities which may be open to the government to divest itself, in favor of the private sector, of certain of the functions it now carries out, particularly those of a quasi-commercial nature. In this connection it must be pointed out that most of the projects have thus far experienced very slow rates of implementation, giving rise to the danger that governments may devote large sums, with the support of the international community, to the continuation of stillborn activities. Of the 13 projects studied, at most two or three have clearly demonstrated to the local authorities and international finance agencies that they constitute a viable approach to increasing agricultural production. The other projects are still far from achieving their planned objectives, whether these are expressed in terms of yields per hectare, area cultivated, rate of peasant adoption of cultural practices, level of operation and maintenance of physical infrastructure, repayment of smallholder loans, recovery of public expenditure, or the amount of produce marketed through official channels. In several cases, the initial project scheme has been succeeded by follow-up projects, supported by the same or a different donor, a sizable share of whose expenditure consists of items that the initial plans had projected as post-development recurrent expenditure to be covered by the host country.

We examine below several of the causes underlying these low levels of implementation. At this stage it should merely be pointed out that the projects

in question have rarely been complete failures, rather suffering from excessively optimistic planning such that the implementation schedule had underestimated the time required to test alternative approaches, both technical as well as socio-economic and administrative, just as it had underestimated the time required to implement whatever alternatives might prove optimal for the area in question.

Given that most of the projects studied deny us an empirical basis for estimating the establishment period for agricultural development projects, we are forced to rely on partial estimates. A consultant who prepared five of the Working Group's case studies concluded that the true establishment period of a typical project was likely to be as long as fifteen years. The first five years should be viewed as a period of experimentation, or in the consultant's phrase, a voyage of discovery.[1] The second five years are a transition period in which one starts to implement the lessons of the first period, while still devoting substantial resources to experimentation. Only in the final five years does the emphasis shift decisively towards implementing a viable development strategy. A donor currently engaged in financing crop protection in the Sahel, proceeding cautiously on the basis of its experience in other parts of Africa, estimates that a minimum of twelve years is necessary to establish an adequate protection scheme, limited to a particular zone of average size in a Sudano-Sahelian-type country. (By contrast, another donor with experience in this sector concluded its intervention after approximately eight years.)

[1] The term was first applied in the context of aid-financed development projects by Albert O. Hirschman, Development Projects Observed, The Brookings Institution, 1967.

IV.2 Estimation of the recurrent cost coefficient for agricultural development projects.

In the case of ten of the 13 projects studied, the Working Group was able to locate data relating, on the one hand, to development expenditures during the initial project and, on the other hand, annual expenditures,estimated or projected,subsequent to that phase. In these cases an r-coefficient was calculated as the ratio between the two types of expenditure (Table 4.2). Taking into account the foregoing section we hasten to point out that the coefficients given in Table 4.2 are maximum values of "r": this is because there is no certainty that the volume of nonrecurrent expenditure given in the denominator of the coefficient will be sufficient to ensure the project of a certain degree of viability (given the length of time required for project establishment as suggested in the preceeding section, this underestimation of the denominator for "r" may vary from 0 to 70%...)

A comparison of "r"-values for the 10 projects indicates a range of 0.03 to 0.40, the projects being distributed as follows by intervals within this range:[1]

r-value	0 to 0.05	0.06 to 0.10	0.11 to 0.20	0.21 to 0.25	over 0.25
Number of operations (total: 10)	3	2	2	2	1

Clearly the range is too wide to be of any help in estimating a single value of "r" that could be applied mechanically and systematically in projecting recurrent expenditures of all future agricultural development projects in the Sahel. This should not, however, come as a surprise since each project in this category comprises a potpourri of different, often unrelated activities. To look for a relatively stable value of the r-coefficient, one would calculate a measure of central tendency (e.g. the mean) for a given function over a set of projects. The Working Group consultant undertook such an exercise with respect to four of the ten operations (Table 4.3).

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[1] Interpretation: an r = 0.10, for example, signifies that an annual recurrent cost flow of 100,000 francs is associated with non-recurrent expenditure of one million francs.

TABLE 4.3

Breakdown of recurrent/non-recurrent expenditure coefficients for four World Bank-supported agricultural development projects in the Sahel*

	Integrated rural development projects			
	Maradi Rural Development Project (Niger)	Sedhiou Rural Project (Senegal)	W. Volta Agric. Dev. Project (U. Volta)	Second Rural Development Fund (U.V.
Planned project duration	3 yrs.	4 yrs.	5 yrs.	5 yrs.
	r-coefficients			
Component				
Admin. by gov't ministry			0.11	
Project management unit evaluation	0.27	0.29	0.13	
Regional headquarters				0.16
Extension	0.29	0.17	0.16	
Staff Training			0.16	
Rural works	0.13			
Irrigation			0.05	0.23
Cooperatives	0.35	0.33		
Community Development (health, education)	0.37		0.23	
Roads			0.10	
Animal health	0.36			
Input subsidies			0.43	
Buildings				0.08
Boreholes				0.12
Wells				0.02
Total	0.25	0.16	0.16	0.10

*Coefficients are consultant's estimates of post-project recurrent expenditure divided by cumulative expenditure, capital and O & M, on the respective component during indicated project duration.

The project components are only roughly comparable due to problems of task definition and cost allocation. The table permits comparison of eight value-pairs, not counting the total coefficients. Three of the comparisons are very close (0.27-0.29; 0.17-0.16; 0.35-0.33), while five involve substantial discrepancies (0.29-0.16; 0.29-0.17; 0.29-0.16; 0.05-0.23; 0.37-0.23).

In general, cooperatives, community development and animal health exhibit relatively high coefficients, reflecting shared characteristics of (1) low initial capital costs, (2) high personnel and operating (including vehicle) costs and (3) a phasing of activities that leads to post-establishment recurrent costs somewhat above the corresponding annual cost during project establishment. The only other point of comparability suggested by the table relates to maintenance of physical infrastructure (feeder roads, buildings and boreholes), involving coefficients in the range 0.08-0.12.

Taken together the results of Tables 4.2 and 4.3 reinforce our earlier cautions against reading economic significance into the distinction between development expenditure and recurrent costs, at least with respect to agricultural development projects. They also point to the desirability of disaggregating to the greatest extent possible information on the various components of different projects. Finally, they support further our stricture against using minimization of the r-coefficient as an alternative criterion in project selection. The fact that project A takes longer to identify a viable intervention strategy than project B, though both involve the same annual recurrent expenditure once established, gives A a lower "r" coefficient than B, but this very fact makes B more profitable than A.

IV.3 Cost recovery in agricultural development projects

Table 4.4 summarizes the information that was available to the Working Group concerning recovery of recurrent expenditures for ten of the 13 projects in the sample. Our previous observation that most of the projects have not yet succeeded in establishing viable productive capacity is, of course, closely related to the conclusion emerging from the table that the projects have not so far shown themselves capable of covering a significant proportion of estimated or projected recurrent costs. Diagnosis of the

TABLE 4.4 : Estimated/projected recurrent expenditure and cost recovery in sample of 12 agricultural projects in the Sahel

(All figures in millions of francs CFA except for two Mali projects -- OACV = FM millions, Office du Niger = FM/ha. Unless otherwise indicated in notes, all figures in current prices of indicated year(s).)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
			Annual revenue attributable to project			
Country	Project	Author(s) of case study report	Source-- page nos. in case report	Amount	Annual recurr. expend. after project completion including input subsidies, if applicable (from Table 4.2)	Annual proportional cost recovery (4)/(6)
Chad	--	Thénevin	p. 49	3950-4640	3,111	1.27-1.49

NOTE: Revenue data for 1976-77. Minimum estimate includes, as indirect revenue, duties and taxes on imports of Cotontchad and its local suppliers, direct taxes on Cotontchad employee incomes, and indirect taxes on employee and peasants' consumption purchases. Max. est. includes this x 3.0 as multiplier. Indirect rev. accounts for 10% of cost recovery in min. case, 25% in max. case.

Mali	--	Bah	p. 52	1,600+	2,626	0.61

NOTE: Revenue comprises "extension tax," levied on groundnut exporters; OACV gross trading margin; and other income (transport, sale of inputs, etc.). Estimate is average for 3 yrs., 1976-78.

Mali	--	Martens/ Sorgho/ Kessous	p. 25	FM 14,820 per irrigable hectare	FM 46,566-63,905 per irrigable hectare	0.23-0.32

NOTE: Revenue = rice producer price (1978) of FM 50/kg. times water and extension tax of 400 kg. per cultivated ha. times 0.741 (= cultivation as % of irrigable area).

Niger	--	Funel/ Lemelle	pp. 60,119	148	266	0.56

NOTE: Revenue data for 1978. Comprises AHA receipts other than government and foreign subsidies. Taking into account taxes generated by "downstream" activities in distribution chain, case study report (p. 131) estimates net government deficit at 198 m. F CFA, or 80 m. more than deficit shown here. To this might be added 85 m. subsidy financed by foreign aid.

TABLE 4.4 cont'd

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Niger	--	Schneider	p. 17	54	599	0.09

NOTE: Revenue comprises IBRD appraisal report estimate of project-induced general tax revenue in 1977. No allowance is made for indirect tax on incremental groundnut production--case report suggests world market conditions may not permit (pp. 17-18).

Niger	--	N. Essama	pp. 16, 19-20	negligible	281	negligible

NOTE: Given official producer price about half that on parallel market, and project's failure thus far to develop high-yielding variety, case report sees little prospect for direct revenue generation.

Senegal	Sedhiou	Schneider	pp. 30-31	0	524	0

NOTE: No incremental production thus far attributable to project.

Senegal	--	Bénédic/ Bosshardt	p. 38	111-261	460	0.24-0.57

NOTE: Revenue data for 1978/79. Comprises 11 m. taxes generated by SODEVA factor payments, plus 100-250 m. receipts from marketing incremental groundnut production attributable to project, depending on FOP price.

Upper Volta	--	Richet/ Sorgho	pp. 27-28	1,000	1,285-1,645	0.61-0.77

NOTE: Revenue figure in 1977 prices, derived by averaging results for crop yrs. 1976/77, 1977/78 and 1978/79, and extrapolating to 15,000 eventual settlers. Comprises 700 m. from cotton exports and 300 m. duties and taxes on inputs and peasants' and employees' consumption purchases.

Upper Volta	Second Rural Development Fund	Schneider	p. 17	93	307	0.30

NOTE: 1978/79 prices. Case report projects cotton marketing margin of 20,900 F. CFA/ton times 4,400 tons incremental production on 7,000 ha. anti-erosion sites. User charges under discussion but so far not applied.

TABLE 4.4 cont'd

(1)	(2)	(3)	(4)	(5)	(6)	(7)
Upper Volta	West Volta Agricultural Development Project	Schneider	p. 39	468	741 (equiv. in 1979 prices to 575 in 1976)	0.63

NOTE: 1979 prices. Cotton marketing margin of 20,900 F. CFA applied to incremental production target of 22,415 tons (according to IBRD appraisal report).

factors underlying this shortfall is a prerequisite to ensuring the adequate financing of agricultural development projects; such is the object of the present section.

1. Dependance of cost-recovery on marketing arrangements.

Vehicles for cost recovery in Sahelian agricultural projects, virtually all of which are based on smallholder agriculture, differ according to the marketing arrangements applicable to the target commodities.[1]

At one extreme are found cash crops (cotton, peanuts) intended primarily for export. The physical and administrative arrangements applicable to such crops normally ensure effective control over movement of the produce, enabling the government agencies involved to recover their expenses out of sales proceeds. This does not, of course, mean that they are free to cover any desired level of cost; the agencies are generally conscious of the need to maintain producer incentives and thus avoid, among other things, leakage of produce across international boundaries.

At the other extreme are found rain-fed foodcrops such as millet, sorghum, niébé, upland rice, etc.)[2] For such crops administrative controls are generally insufficient to ensure marketing of the entire harvest through official channels, thus preventing the government agencies concerned from recovering their costs out of sales proceeds. As for the possibility of selling farmers inputs for cash, very few can or are willing to pay full cost in advance, let alone the surcharges corresponding to the development agency's expenditure on extension and other services. Like the herdsman who is willing to pay only for what actually goes into his animal, as the

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[1] Large-scale plantation agriculture, which is rare in the Sahel, permits recourse to other methods of cost recovery.

[2] The distinction between cash and foodcrops is not always evident; for example, a sharp drop in the world peanut price may induce the peasant to utilize his crop for human consumption rather than selling it for export.

Working Group was informed by Sahelian livestock experts, so the peasant is ready to pay only for what actually goes into the soil he cultivates. Nevertheless, given the Sahelian countries' primary concern to ensure coverage of their populations' basic food requirements, the existence of such obstacles to cost recovery rightly does not prevent the countries from considering that foodcrop interventions retain a high rate of return from the viewpoint of society as a whole, lending political and social justification to government support of such activities.

Seeking to ensure the financial viability of these interventions, the state looks for sources of indirect tax revenue at higher stages of the production and distribution chain. Inasmuch as most of these receipts are received by the national Treasury rather than the agency involved in the initial production stage, the rate of cost recovery as seen from the latter's viewpoint is likely to remain weak, while there are grounds for hoping that financial balance between receipts and expenditure at the level of the government as a whole can sooner or later be achieved.

Located betweeen these two extremes are projects oriented towards irrigated foodcrops, principally rice, while on the other hand nutrition-oriented projects constitute a special case. Activities of this latter type focus on production for the purpose of increasing food consumption of peasant producers and their families. In such cases, which happen to be absent from our sample, there is by definition little if any possibility of cost recovery.

2. Relationship between cost recovery and economic performance

Clearly the correlation between economic and financial outcomes will be particularly close in cases of projects whose marketing arrangements generate revenues at higher levels of the production and distribution chain. More than once in the Sahel a favorable world market price has compensated for economically unsuccessful intervention on behalf of a cash crop. On the other hand such is not likely to happen in the case of foodcrops, all the more so because of frequent attempts to control producer prices in the interest of subsidizing consumers, notably in the urban areas, an issue about which more will be said below.

The economic performance of agricultural development projects in the Sahel and, thus, their capacity to generate receipts leading to cost recovery, has encountered obstacles in the following five areas, apart from the vagaries of climate:

i. inputs
ii. farmer participation
iii. the producer price system
iv. vehicles employed to deliver new technology
v. project management

Inputs. The 13 case studies have brought out a number of examples of ineffectiveness of inputs (no implication is intended that any single example is characteristic of all the projects in the sample).

i. yields of improved seed distributed to farmers have proven inferior to those of traditional seed under typical soil and climatic conditions.
ii. lack of complementary inputs and/or use of inappropriate techniques of cultivation have forestalled the increase in productivity expected from project-induced fertilizer application;
iii. the useful life of irrigation infrastructure has proven too short to amortize its costs.

Farmer participation. Several case study reports point to the existence of a labor shortage during periods of peak demand for labor, resulting in plot abandonment. Below-target adoption of new input packages or techniques of cultivation in some projects is attributable in part to the risk aversion of individuals living close to the margin of subsistence. With regard to rain-fed foodcrops, this reticence is undoubtedly reinforced by the fact that the Sahelian peasant, seeking rationally to minimize his risk associated with vagaries of climate, frequently plants a number of different seeds (in some regions, as many as 20 or 30) -- each of which is particularly resistant to a certain climatic event (lack of rainfall during planting, heavy rainfall at the point of germination etc). By contrast, implementation of a project makes him dependant on a single variety, i.e. the improved seed featured in the project, whose superiority to traditional seeds is not always evident, as mentioned previously. The risk which the peasant has to bear is thus as a rule substantially increased and his resistance to the project should come as no surprise.

The Producer price system. Sahelian governments affect agricultural producer prices, intentionally or unintentionally, through several policy instruments. To begin with there is the foreign exchange rate, expressing the number of local currency units -- e.g. francs CFA -- per unit of foreign exchange -- U.S.$1.00. By definition, an upward or downward shift in the exchange rate leads to a proportional change in the local currency equivalent of the foreign currency price, FOB, for a Sahelian export commodity.[1] Since the producer price for cash crops is the residual between the export price and the margins of taxation and internal distribution, considered here as givens, shifts in the exchange rate affect the producer price more than proportionally. (Insofar as other cost items in the price schedule have foreign exchange components whose local currency equivalent varies with the exchange rate -- for example, fuel used by trucks to move produce -- producers could not expect to receive the full absolute value of the local currency equivalent of, say, a

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[1] This analysis is based on the standard assumption that the Sahelian exporting country has no control over the prices of its exports, expressed in foreign exchange.

rise in the export price resulting from an exchange rate devaluation.[1]

Apart from shifts in the exchange rate, producer prices for cash crops are similarly affected by decisions concerning levels of other components of the price schedule, including reserves for price stabilization and development agency administrative costs.

With respect to food crops, most governments, including those in the Sahel, seek to insulate domestic food prices from fluctuations in the foreign exchange rate. In the Sahel a dominant concern is to hold down price increases that raise the cost of living of urban dwellers, and especially public sector employees. Two measures of economic policy are utilized to this end: (1) importing foodstuffs and (2) channeling a portion of domestic food production through official marketing agencies which supply it to a favored clientele as wages in kind or at prices below levels that would equilibrate domestic supply and demand.

The issue of cereals price policy in the Sahel has been receiving close attention since 1977 from a working group established for this purpose under the aegis of the CILSS and the Club du Sahel, and we have no intention whatever of usurping the role of this group.[2] The Working Group on Recurrent Costs merely wishes to point out in the present report that the pursuit of political and social objectives in the Sahel, and measures associated with these objectives such as the determination of producer ceiling prices, have by all indications contributed to jeopardizing attainment of the targets of foodcrop production projects along with recovery of their recurrent costs.

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[1] For this reason it is legitimate to refrain from passing on to the producer a portion of the surplus resulting from devaluation of the national currency.

[2] C. f. inter alia: CILSS-Club du Sahel: "La Politique Céréalière dans les Pays du Sahel," Nouakchott colloquium, 2-6 July 1979.

Vehicles employed to deliver new technology. Transmission of new techniques of cultivation has a direct and often significant impact on recurrent cost levels of agricultural development projects in the Sahel because of the large proportion of public expenditure on such projects allocated to extension and other supporting services. Failure of the extension function, perhaps more than any other shortcoming, can jeopardize the success of an entire project; if the extension agents are unable to demonstrate clearly to the farmer that they are offering him a technology that is definitely superior to traditional procedures, the farmer-extension officer relationship breaks down rapidly and demoralization will afflict the entire project.

The question of cost-effective delivery of new technology is also, in our view, first and foremost an economic problem. The delivery systems in operation in the Sahel are more or less faithful reproductions of models applied initially in the developed countries. Where they have been introduced in developing countries, these models have frequently failed to attain the results which might have been expected from them. For example, in several parts of the world, including the Sahel, in some projects it has turned out that the peasant resists the intervention of young extension agents whom he considers to be inexperienced strangers to his milieu. An alternative model for delivery of new technology would be to devote part of the public expenditure set aside for a project to financing, at least during an initial phase, private traders who would be encouraged to act as distributors and demonstrators of inputs associated with the new technology. Against this is the argument that it is precisely the vacuum left by the private sector that public extension activity is required to fill. However, observation of Sahelian society indicates that nowhere does it lack individuals ready to exploit an opportunity for profit, particularly in the sphere of commercial activity. The discussion thus comes back to the issue of producer price policy: an inadequate producer price does not leave room for a sufficient margin to convince traders to participate on a regular basis in the distribution and demonstration of new inputs.

Project management. Problems identified by the Working Group in the area of management rarely concerned the competence of individual project managers, which the Group's consultants found by and large to be truly impressive. Rather, management problems in Sahelian agricultural development projects relate to the capacity of ministry and agency headquarters to respond efficiently to the demands arising from conduct of field operations.

In a number of cases government agencies responsible for the production side proved to be overextended in implementing their responsibilities under a system where the state assumes directly, in a centralized manner, an impressive number of functions on both the production and distribution sides. Excessive centralization was also found in several cases to have delayed the execution of payments, thus disrupting the provision of inputs, including seeds, at times when they were required in accordance with the agricultural calendar. Such situations have an obvious impact on the calculation of recurrent costs, leading in general to underestimation of the cost of centralized management, which is in turn aggravated by the bloated payrolls that frequently afflict public sector agencies.[1]

In conclusion, the case studies show that the problem of recurrent cost financing in the agricultural sector is related primarily to the sector's poor economic performance, which in turn substantially restricts possibilities for cost recovery.

3. Cost recovery shortfalls attributable to factors other than low productivity.

Whatever the importance of the foregoing conclusion, it is worth mentioning that one of the case studies, a major irrigation scheme, is experiencing a cost recovery shortfall associated in the first instance with financial rather than economic ramifications of the producer price policy issue. The project has demonstrated over a number of years that it can provide several thousand families with a livelihood, which, while far from luxurious, has been sufficient to deter systematic desertion towards alternative employment. However, as a result of the official producer price which the government pays to the project, according to our estimates the latter is able to meet only 25-30 percent

1 The question of staffing, which is one facet of the macro problem of national resource allocation, is addressed further in Part Three of the report.

of the cost of minimal maintenance requirements of project facilities. Consequently, at some point within the foreseeable future heavy expenditure on rehabilitation will be necessary to prevent substantial loss of production. If at that time the government is unable to meet these needs -- in fact it is currently requesting finance for this purpose from the donor community -- there is a danger that the project's performance will decline to a level threatening the survival of the whole operation.

Apart from the producer price issue, several of the integrated rural development projects in the sample point to a potential cost recovery problem in respect of social activities, i.e. health and education, carried out under their aegis. At the present time these activities are still largely supported by foreign aid inasmuch as the projects themselves are still in their establishment phase. The aid financing ensures health and education services (primary care and literacy training) which are superior both in quality and cost to those enjoyed by neighboring villages outside the scope of the project. It is, of course, unrealistic to hope that these projects could finance such activities out of commodity sales proceeds after the donors have left. Nor is it any more realistic to believe that the governement will agree to allocate sufficient funds to maintain such activities at a level superior to the average level of service available in the country as a whole. Possibilities for ensuring the continuation of these activities on the basis of increased voluntary contributions, in cash or kind, from the benefitting communities, or the imposition of user charges, are considered in Chapter VIII concerned with projects in the field of human resources.

IV.4 Alternatives for cost recovery

The preceding discussion of the shortfall in financing recurrent costs of agricultural development projects indicates clearly that the solution to the shortfall does not depend solely on increased foreign aid, although the latter also has a role to play.

1. Possible role of foreign aid

The case for increased foreign aid to the Sahelian agricultural sector is perhaps strongest with respect to projects whose primary objective is to meet the food requirements of the population in the producing areas themselves. We saw earlier that possibilities for cost recovery at higher stages of the commodity production and distribution chain are almost non-existent in such projects.[1] The imposition of marketing arrangements designed to facilitate cost recovery would be counterproductive and would increase the net burden on the government budget associated with operating the machinery in question. Assuming that the inputs and services provided are cost-effective, foreign aid for recurrent expenditure on nutrition-oriented activities would contribute to reducing disparities in living standards among different countries and regions, consistent with the Basic Needs approach which figures prominently in the aid strategy of several donors involved in the Sahel.

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[1] This assertion must be qualified insofar as increasing labor productivity in food crops permits farmers to transfer part of their energies to cash crops more readily subject to indirect taxation, e.g. export taxes. One of the major donors in the region, aware of this relationship, is prepared to assist food crop projects in the Sahel only if they encompass a significant element of cash crop promotion.

Other lessons for both donors and host governments which emerge from the preceeding discussion:

i. the need to recognize the experimental character of most agricultural development projects currently underway in the Sahel;

ii. the desirability of exploring technology diffusion models that transfer some current public sector functions to the private sector;

iii. the desirability of supporting efforts by the Sahelian countries to rely more heavily on producer price incentives. As already indicated this point falls within the purview of another CILSS/Club du Sahel working group and will not be further discussed here.

2. Recognizing the experimental character of agricultural projects

The experience recorded in the Working Group's case studies reflects the zeal with which both host countries and donors went about the task of overcoming the devastating losses of the drought period in the 1970's and putting the Sahelian countries on the path towards food self-sufficiency. In support of these goals, development strategies that were not yet mature from either a technical, socio-economic or administrative viewpoint were unleashed on sizable smallholder populations. This experience has led to significant advances in the state of knowledge about what interventions have a chance of succeeding in the Sahel, but it is still far from definitive. Thus, a number of activities set up under these projects during the last decade, retain an experimental character as of 1980; hence, contrary to initial plans, the expenses associated with them are properly considered as still being development or non-recurrent costs.

It did not form part of the Working Group's research mandate to perform ex post economic evaluations of development projects in the Sahel, nor to design preferred alternatives to existing public investment programs. The case study reports do not establish rigorously whether the scale on which projects have actually been carried out is or is not cost-effective from the viewpoint of enhancing the welfare of as large a proportion as possible of the

Sahelian population. But the findings of most of the case studies tend to confirm that it would have been preferable to aim initially at smaller target populations, build an experimental approach more explicitly into the majority of projects, and persuade the donors to accept, unofficially if not in formal agreements, a time horizon for project implementation considerably longer than the current standard three-to-five year commitment. Apart from saving wasted resources, both local and foreign, the parties would have gained considerable flexibility to adapt to unfamiliar circumstances and evolve optimal procedures for longer-run, fuller-scale operations. In our view, greater reliance on this approach in the future would reduce the potential for uncovered project expenditure posing a heavy burden on Sahelian national budgets.

3. Exploring alternative models for technology diffusions.

Our discussion in section IV.3 has suggested that what might be called the "command" approach, where modern inputs are promoted and distributed via a government bureaucracy that has to be subsidized out of general revenues, is only one of several possible models. One could just as well subsidize private traders, or let them earn reasonable profit margins on higher producer prices, the impact on consumers being dampened by direct subsidies to those with the least purchasing power. The relevant question is: which model is cost-effective?

There is some reason for expecting the private input supplier, motivated by profit, to be a more effective operator than his government counterpart, devoting longer hours to his job and making more efficient use of the capital available to him. With respect to production credit, the private intermediary who has roots in the community he serves and can avail himself of social sanctions against defaulters makes a more efficient debt-collector.

Evidence available to the Working Group does not resolve the question of cost-effectiveness once and for all, however information supplied by a case study of a rural development project in Niger gives an indication of orders of magnitude which one would deal with in answering the

question. At the end of the project's second year 231 extension agents were reported to be supervising 7,533 farmers cultivating 7,607 ha, of which 60% was under peanuts. Given total monthly expenditure of approximately F.CFA 45,000 per agent, the extension effort devoted to groundnuts can be costed very roughly at F.CFA 75 million per year (equal F.CFA 45,000 X 12 months X 231 agents X 0.60 proportion of supervised area under peanuts), i.e. F.CFA 16,500 per hectare per year. Assuming an average yield before the project of 600 kg peanuts per ha., and a producer price of F.CFA 50/kg., or gross revenue of F.CFA 30,000 per ha., extension at the indicated level of one agent per 33 farmers appears to offset slightly over half the value of pre-project output.

This comparison raises two questions. Firstly, can extension activity at this level be expected to raise agricultural yields sufficiently --i.e. by more than 50 per cent--to offset its own cost? And secondly, would the provision of an annual subsidy of F.CFA 75 million on purchases on inputs by private intermediaries, with a view to inducing them to demonstrate and promote the use of the items in question, lead to lesser or greater increases in yields than those resulting from the extension alternative? It should be noted that F.CFA 75 million is equivalent to 1,500 tons of peanuts X F.CFA 50 producer price with no purchased inputs, or about 1,850 tons if 20% of receipts is offset by inputs, amounting to roughly 2% of Niger's 1979 peanut production of 80,000 tons.

IV.5 Rural water supply

The study of the rural water supply sector focused on a single program in one Sahelian country, namely the activity of the Société d'outillage mécanique hydraulique (SOMH), an affiliate of the Directorate of Urban and Rural Water Supply of Senegal's Ministry of Public Works (équipement).[1] As of 1979 the SOMH operated 85 boreholes. Secondary sources relating to other Sahelian countries were consulted in the course of preparation of the Senegalese case study.

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[1] Up to March 1978 this directorate was attached to the Ministry of Rural Development and Water Supply.

The program reviewed by the Working Group is dual-purpose, serving both human and animal consumption. Drinking water and water for livestock are essential elements of the rural population's subsistence, such that people must obtain it with or without government intervention. Government intervention enhances social welfare in two ways: firstly, by reducing the effort which the population must put forth to obtain a given quantity of water, thus making it possible for the average user to increase daily consumption both for his family and his stock over the level prevailing without government help, and secondly, by improving the taste and hygienic properties of drinking water.

Such benefits are sufficiently perceptible to the population concerned for it to be willing to give up something in return -- i.e. pay for the improved water supply. The reason why the private sector has thus far held back in substituting itself for national governments and foreign donors in establishing and operating rural water supply projects is that the value of what the population is willing to exchange in order to improve its present water supply is less than the cost of the new supply. Given this circumstance government intervention is justified by the existence of public goods associated with providing the population with a regular supply of potable water. In the case of rural water supply projects one can cite at least three types of public goods: control over water-borne diseases reducing the risk of exposure to non-users as well as users of the new supply; reduced risk of wholesale socio-economic disruption resulting from periodic drought; and finally, national policy-makers and the urban population in general receive political benefits in conjunction with improvement of rural living standards as the rural population obtains access to an assured supply of water.

Without taking into account these inherent characteristics of rural water supply programs and projects, it is difficult to understand the problems arising in regard to the sector's recurrent costs and their recovery.

1. Estimation of recurrent costs

Table 4.5 gives estimates of annual operation and maintenance costs, actual or budgeted, for three types of rural water supply systems in Senegal: wells, from which water is drawn by hand in a bucket or other vessel on a rope; pump-wells, which use a hand pump; and boreholes featuring a mechanical pump powered by a diesel engine.

TABLE 4.5

Recurrent costs of rural water supply in Senegal

(000 F.CFA per well/borehole)

Type of system	Personnel costs	Fuel and lubricants	Spare parts	Repairs	Sub-total (2) + (3) + (4)	TOTAL (1) + (5)
Wells						10
Pump-wells						30-50
Boreholes[1] --range		900 - 1600	250-580	20-60	1330-2170	
--average	2000[2]	1100	390	90	1580	3580

[1] Sample of seven. Data are averages of estimated or budgeted expenditure during 4 budget years, 1975/76 - 1978/79, and therefore reflect the mean price level during that period.

[2] Total personnel expenditure of SOMH divided by 85 boreholes under its jurisdiction. Available data do not permit differentiation according to allocation of staff time per borehole.

The figures in Table 4.5 for wells and pump-wells are rather notional estimates of what it costs to maintain such installations in working condition. There is little or no expenditure on operation as distinct from maintenance, since users draw the water themselves. The consultants' report to the Working Group, on which this discussion is based, bears largely on boreholes.

The distinction drawn in Chapter Two between actual recurrent expenditure and various notions of "optimal" expenditure is particularly relevant to rural water systems using motor pumps. The typical borehole is designed for operation on average 15 hours per day, however performance falls far short of this, as indicated by figures of average daily operation during 1977/78:

TABLE 4.6

Daily duration of borehole operation

(1977/78 data)

Average hours of daily operation	Number of boreholes	Percentage of 79 boreholes
less than two hours	10	13%
2-4 hours	43	54%
4-8 hours	24	30%
more than 8 hours	2	3%
Total		

The consultants suggest that 15 hours of daily operation is unrealistic, proposing instead a norm of eight hours against which to measure full-capacity operation. By this standard the 79 boreholes were utilized at slightly below 50% of capacity, operating on average just under four hours per day. Low capacity operation is attributed to two main factors, (1) lack of funds to purchase fuel and lubricants, and (2) inadequate maintenance resulting in breakdowns and excessive periods of down-time. Inadequate maintenance is attributed not only to a tight budget but also to management problems in the parent agency. Its impact is reflected in premature deterioration of pump motors, whose design life is 5 years; out of the sample of 7 boreholes cited in Table 4.5, in 5 cases motors have had to be replaced at least twice during a four-year period.

The Working Group's consultants estimated that operating all 85 boreholes for an average of 8 hours per day would have required a doubling of the SOMH's 1978/79 budget for fuel, lubricants, and spare parts. In actuality, the materials budget was constant in terms of current prices from 1975/76 to 1978/79, corresponding to a considerable reduction in real terms. Meanwhile, the personnel budget grew by 62% during this period lowering the materials/personnel expenditure ratio from 0.63 in 1974/75 to 0.40 in 1978/79.

2. Financing and cost recovery

Investment in the rural water supply sector in the Sahel is financed primarily by foreign aid (accounting for over 90% of commitments under Senegal's fifth Five Year Plan through 1978). Foreign aid also contributes frequently to the cost of work brigades responsible for constructing and repairing wells and pump wells. In the case of Senegal, 30% of operating costs of the well brigades are financed from abroad, leaving the central government budget with responsibility for the remaining 70% plus nearly the entire operating budget of the SOMH. In 1978/79 Senegal's contribution to rural water supply expenditure amounted to about F.CFA 400 million.

Insofar as the donors contribute to rehabilitation of water supply installations, which is nothing more than deferred maintenance, they are in effect financing sectoral recurrent costs. But donors are reluctant to finance annual costs of operation and maintenance, whether personnel or materials, primarily because they do not see current operation of an existing water system as a development activity oriented toward expanding the economy's productive base. In contrast to agricultural projects, the rural water supply sector offers less scope for experimentation, which might attract the interest of certain donors. Once water has been found not unreasonably far below the surface, lifting and distributing it involves straightforward technology without much scope for cost reduction. Exceptions to this are experiments with wind- and solar-powered pumps, to which donors are currently contributing in some countries to both capital and operating costs.

With regard to possibilities for recurrent cost recovery, instances are reported where, with SOMH funds for purchase of fuel and lubricants

blocked or exhausted, villagers have taken up a collection to keep their boreholes in operation. During 1978/79 users of one SOMH borehole contributed an amount equivalent to 18% of annual recurrent expenditure net of personnel costs (Table 4.5, column 5). Clearly such expression of interest on the part of the community contains the germ of a system of cost recovery via user charges.

In the sample of seven boreholes, annual recurrent expenditure per borehole ranged from F.CFA 3.4 million for a small system producing 20 m^3 per hour and operating 4 hours per day, to F.CFA 4.2 million for a large system producing 50 m^3/hr. and operating on average 7 1/ ours per day. The number of families assumed to benefit from the two ds of the range is 2,600 in the case of the large system and 520 families with the small system.[1] To recover these costs, which include the entire personnel expenditure of SOMH but exclude depreciation and interest on investment, the average family would have to be charged from F.CFA 1,600 (large system) to 6,500 (small system) excluding costs of collection. At first glance this may not appear to represent a significant sum of money, but it must be noted that F.CFA 6,500 represents about 1/10th of per capita income in the poorer regions of Senegal. In such cases full cost recovery from the beneficiaries is clearly out of the question.

On the other hand, in some of the communities served by a borehole there are higher-income families and commercial establishments that have financed the installation of direct connections. At the present time the families and enterprises receive their water gratis although they could clearly afford to pay full cost and even more. Considering that inadequate finance has caused interruptions in service, not to mention forestalled the expansion of the program that would have been desirable, such a situation can only be described as inequitable. Lack of reliable data, inter alia concerning income distribution in the relevant communities, prevents us from estimating the proportion of recurrent expenditure on boreholes subject to recovery from households and enterprises served by direct connections.

Moreover, herders are sufficiently aware of the purely commercial benefits they derive from reliable sources of water in the vicinity of grazing and market areas to have shown repeatedly their willingness to pay for such a service in lieu of having to forego it.[1]

In recognition of these considerations, a commission of experts of the European Communities and the associated Group of African, Caribbean and Pacific Countries (ACP), meeting in Bamako in November 1979, concluded that "final participation (by the beneficiaries) in meeting recurrent costs must be provided for, not only first and foremost in order to ensure that the facilities are maintained, but also to motivate the population to help in their upkeep and to appreciate all aspects of the water produced, including its health benefits." The ACP/EEC Council of Ministers meeting in Nairobi on May 9, 1980, recommended that this "basic principle" be applied "in the design, tendering, execution, management and evaluation of new projects to be financed by the Community."

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[1] See also below, Chap. V, Section V.4.

3. Future prospects

Given the likely growth of Senegal's budget revenues over the next six years, without raising the proportion of its recurrent budget currently allocated to rural water supply -- about 0.4 % -- or introducing user charges, Senegal will not be able to operate its currently existing facilities on an average of eight hours per day, let alone operate and maintain new capacity, whose rate of expansion is projected to increase annual recurrent expenditure requirements from 130 to 200%, depending on the level of capacity utilization.

While aid donors may be expected to continue supporting new projects and financing deferred maintenance on existing ones under the guise of capital expenditure, it is unlikely that they will modify their current policy of refusing to finance personnel, materials , and other items of current expenditure on operating and maintaining wells and boreholes.

Introduction of a cost recovery system based on user charges differentiated according to beneficiaries' income thus appears to be inevitable. Prospects for successful introduction of such a system in Senegal are increased by the present administrative decentralization movement in that country whereby some rural communities have even been given the power to collect certain taxes. Insofar as these local government units perceive a strong demand on the part of their constituents to ensure a regular, adequate supply of water, the new system will be cost-effective; user charge collection costs and the burden of headquarters personnel costs on operation and maintenance expenditure will be reduced.

Nevertheless the prospect of making some headway with cost recovery in rural water supply does not remove the need to follow a stricter approach than heretofore in evaluating proposals for new boreholes. One might, for example, make the installation of a new facility conditional on the community's agreement to cover at least half the recurrent costs. This would make it possible to pursue the program's social objectives while at the same time ensuring its viability. The half of the cost financed by the government would correspond in this case to the public good generated by its support of an activity satisfying a basic human need.

Chapter Five: LIVESTOCK

V.1. Introduction

In the livestock sector three projects were subjected to case studies:

i. the range management program in Senegal run by the Société de développement de l'élevage dans la zone sylvo-pastorale (SODESP);

ii. the smallholder feedlot project of the Etablissement de crédit et d'investissement bétail viande (ECIBEV) in Mali;

iii. The Mopti livestock development project (ODEM) in Mali.

Apart from the three case studies, a large number of reports and other documents on livestock projects in the Sahel were examined, and a sectoral study was prepared concerning animal health services in four countries of the region -- Mali, Mauritania, Senegal and Upper Volta -- complemented by secondary sources concerning Niger.

The principal conclusion emerging from this investigation is the existence of a substantial degree of flexibility for the Sahelian countries to finance recurrent costs of livestock projects on the basis of user charges. At the same time, certain components of these projects have not yet completed their experimental phase, and the associated expenditures should thus be regarded as development costs eligible for international aid financing. However, once these activities have been established, it is reasonable to expect an increasing contribution to their financing from the projects' main beneficiaries.

The following section provides an inventory of the principal government interventions in the Sahelian livestock sector. Subsequently, recurrent costs associated with the different interventions are estimated as far as possible, and a final section of the chapter examines possibilities for increased local financing of these expenses.

V.2 Public sector intervention in livestock activity in the Sahel

The Sahelian countries of West Africa have a strong comparative advantage in the production and, in some countries, the export of livestock and its products. The Sahelian rangeland is suited primarily for grazing because of inadequate rainfall for any but the most marginal agriculture. In addition, this region has few tsete fly and can thus support the large Zebu cattle which are not resistant to trypanosomiasis. Further south, higher rainfall farming areas provide the forage and agricultural by-products which can be used to fatten animals before slaughter. Finally, the coastal countries of West Africa, with their cash crop (coffee, cocoa), mining, and industrial activities, offer rapidly growing markets for meat produced in the interior.

In most of the Sahelian countries, an overall strategy for livestock development is emerging based on regional specialization of activities. The Sahelian zone is seen essentially as a breeding area which furnishes young animals to the Soudanian and Guinean zones for growing out and fattening. For this concept to succeed, herders in the Sahel must be induced to sell young males and unproductive females, leaving most of the pasture for productive females. In addition, productivity can be increased by improving animal health services, especially for calf parasite treatment, and by providing feed supplements. Finally, the available pasture can be better exploited through water development, controlled grazing, and range management.

Young animals from the Sahelian herds may be grown out and fattened in the agricultural areas in a number of ways. They may be sold, sometimes as work animals, to farmers who graze them on natural pasture and feed them agricultural by-products. There is a need here to improve the quantity and quality of feeding, particularly during the dry season when the animals tend to lose weight and the growth process is slowed. Alternatively, the young animals may be kept on ranches where modern range management techniques are employed. These same techniques may also be used in a less formal setting by cattlemen's grazing associations. The last stages of fattening are to be accomplished either in feedlots or by farmers who hold and fatten animals seasonally. In addition to increasing production, Sahelian livestock strategy also calls for improved marketing. Government interventions range from constructing infrastructure, such as loading ramps and holding pens, to supplanting the private sector with state marketing

organizations. Other activities frequently undertaken by government include studies and collection of statistics, the preparation and execution of projects, long-range livestock planning, and the formulation of policies applicable to the sector.

Each of these government activities has a requirement for recurrent public expenditures. In some instances, most of this cost can and should be recovered through the imposition of user charges. At the other extreme, there are government activities creating public goods which should not be charged for directly because of the difficulty of determining the ultimate beneficiaries and because use of these goods by some people does not decrease their availability to others. An excellent example is research related to the livestock sector which benefits farmers, herders, and consumers alike.

Frequently, governments initiate activities which, though they are eventually to be taken over by the private sector as profitable enterprises, are nonetheless at first quite experimental in nature, making it difficult to project their benefits. This implies that all their recurrent costs should not be fully recovered.

Even if benefits are purely private, recovery of all recurrent expenditures may be difficult because of high collection costs. This is especially true in the Sahel because of low population density and high costs of transportation and communication. Even where some form of user charge is collected, the extent to which these funds are available to government agencies involved with livestock varies. Typically, payments received by central government agencies revert to the Treasury and are allocated independently of the sources from which they are drawn. In most instances, these payments are more in the nature of taxes than user charges, though in some cases, such as fees assessed for health inspections, the payments can be fairly closely identified with the value of services performed.

Projects in the Sahel are often administered by parastatal agencies which have a considerable degree of financial and administrative autonomy though formally they are under the supervision of central government. The recurrent cost problem within these agencies is generally much less acute than it is for the central government because most of the parastatal agencies receive direct financing from external donors. In addition, user charges collected by these agencies

are generally retained by them to offset part of their recurrent costs and do not revert to the central Treasury. On the other hand, agencies responsible for livestock development play little role in the marketing of animals, which is accomplished quite efficiently by the traditional trading sector. One result is that these agencies have no control over public revenues generated by livestock marketing, which go to the central Treasury and not to parastatal agencies concerned with livestock.

Finally, there are a number of public enterprises involved in various aspects of production, marketing, slaughter, and processing. In principle, these should be financially self-sustaining, but in practice they often receive substantial public subsidies to compensate for their high operating costs or because the official price structure within which they must operate does not offer them sufficient income.

V.3 Recurrent cost requirements of public sector livestock activities

This section considers in more detail different types of public sector livestock activities in the Sahel, estimates their recurrent costs and examines the impact of inadequate financing of such expenditures.

1. Animal health services

Animal health services were established in the Sahelian countries during the colonial period. Their chief task was protection of herds against the principal epidemic diseases. This was accomplished primarily through immunization programs conducted each year. The major target during this period was rinderpest.

After independance an inexpensive vaccine against rinderpest was developed which was not dangerous to the animals vaccinated and which gave relatively long immunity. In contrast to that which was used earlier, however, the new vaccine had to be kept refrigerated prior to use. This had important implications for the type of delivery system which was developed. Using the new vaccine, a large-scale joint vaccination campaign against rinderpest was mounted during the mid-1960's. The campaign, Joint Project 15, was financed by the U.S. Agency for International Development and the European Development Fund. Mobile teams were used to vaccinate all animals which could be found for three years in succession. The vaccinations were given free of charge but, in contrast to previous years, were compulsory. The project was a considerable success, and

the incidence of rinderpest was substantially reduced.

Nevertheless, there remained much to be done. Although rinderpest was much less of a problem after the campaign, other epidemic diseases such as contagious bovine pleuropneumonia (CBPP) remained a serious problem. In addition, trypanosomiasis was widespread in higher rainfall areas, and there was a continuing need for parasite treatment, especially for calves.

The animal health services of the Sahelian countries were well equipped with vehicles, cold storage equipment, and other supplies during the joint vaccination campaign. Following this, however, national governments provided inadequate financial support for the operation, maintenance, and repair of this capital stock. As a result, field operations were hampered to the point that, in the absence of continued vaccination of young animals, rinderpest began to reappear. Herders, who had been convinced of the value of having their animals vaccinated during JP 15, demanded that these services be continued. The response of the animal health services varied among countries.

In Upper Volta the government responded by ordering vaccines from Dakar or Europe and delivering these to herders, who paid for their cost and had animal health service personnel administer them. This procedure worked well and was soon extended throughout the country. Herders in Upper Volta today pay for the cost delivered to Ouagadougou of all vaccines and medicines, plus about 10 percent to cover part of the cost of internal distribution.

In Mali no official system of herder payments for vaccines has been employed, but there exist on a widespread scale informal payments for veterinary services and supplies. Although little is known about this informal payments system, several aspects of it are evident. First, it provides a mechanism for allocating the relatively limited supplies of vaccines and medicines. Second, it demonstrates the willingness of herders to pay for veterinary services. There is however a problem of quality control of medicine distributed by the private sector, much of which comes from Ghana and Nigeria. Recognizing this, the Malian government is in the process of establishing a system of public veterinary pharmacies through which vaccines and medicines of known quality will be sold.

A similar system in which veterinary supplies will be sold through herder cooperatives, is also being established in Senegal. Until 1976, animal vaccines and medicines were generally provided free of charge, but from that year payments were required for everything except vaccines against rinderpest and CBPP, the only two vaccinations which are compulsory. Charges are based on costs in Dakar, however, and do not pay for delivery except when veterinary services are channeled through one of the public rural development companies.

The animal health situation in Mauritania is worse than in any other country. Population is sparse, delivery distances are long, transport costs are high, and trained personnel are insufficient. All vaccinations and treatments are free of charge. This results in a heavy budgetary burden associated with vaccinations not only of Mauritanian cattle but also of cattle from Mali and Senegal brought into Mauritania to take advantage of the free service.

Drought in the early 1970's compounded earlier budgetary problems. Some relief was had through emergency foreign aid, which for a time paid part of the operating costs of the animal health services and purchased a few new vehicles, but within a few years the situation had further deteriorated. The result was a radical reassessment of the animal health picture and a growing belief that herders and farmers were going to have to participate more fully in the provision of veterinary services. The experience of the last 20 years has also demonstrated the need for closer harmonization of national policies at a regional level in order to avoid, among other things, the temporary or even permanent transfer of herds from countries with costly animal health services to those offering such services free of charge.

Animal health services today are organized essentially along the lines established during the colonial period, notwithstanding differences in detail among countries.

At the top is a livestock department contained within the ministry of rural development. The director of this department has overall responsibility for all livestock development in the country. This may include animal health,

meat inspection, livestock marketing, and improved animal production. In practice, however, other government agencies handle most public involvement in marketing and production, and the overriding concern of the livestock department is, therefore, with animal health. This is carried out by a special service within the department which supervises field operations, stocks and medicines, and may undertake diagnostic activities.

Field activities are generally carried out in a number of different veterinary districts (circonscriptions, régions),each of which is headed by a veterinarian, or an assistant veterinarian where there is a shortage of qualified people. Each district is in turn divided into from two to seven sectors, with assistant veterinarian, or an assistant veterinarian where there is a shortage of to four sub-sectors. Veterinary posts headed by veterinary nurses are located at the sub-sector level and at major gathering points, such as the principal markets. Each post is responsible for diagnosis, vaccination, treatment and keeping statistical records related to animal health.

Vaccines, medicines, and other supplies are purchased from local veterinary laboratories or are imported by the animal health service. They are generally held at a central pharmacy in the capital city until picked up by the district offices. These offices have freezers for vaccine storage, a minimal amount of veterinary equipment and medicine, and diagnostic laboratories. Freezers, generally of the kerosene type, also exist at the sector level along with a very limited supply of equipment and medicine. Cold storage facilities, equipment, and medicines are less adequate at the veterinary posts. Finally, vaccination parks are scattered throughout each sector in areas of high cattle concentration and considerably facilitate the vaccination process, but many of these suffer from poor maintenance.

In general it is not feasible to deliver vaccines to veterinary posts on a regular basis, especially when these are located in remote areas. Frequently, sector chiefs must rely on donkey or camel transport or very unreliable private vehicles.

Because of the difficulty of maintaining a system of sustained delivery of vaccines to the field and because migrating cattle tend to be concentrated in accessible areas during only part of the year, most vaccinations are given during annual campaigns. These are relatively intensive efforts to mobilize available vehicles and to organize the distribution of vaccines during a period of a few months following the rainy season.

Budgeted recurrent expenditures for animal health services from 1968 to 1979 are shown in Table 5.1 in both current and constant (1975) prices. The expenditures are broken down into personnel costs and the material, or operating, budget. Although the data are for budgeted rather than actual expenditures, the two are quite similar in most years.

The figures suggest that personnel costs have risen more or less in line with inflation over the past ten years but that the real (constant-price) value of the operating budget has tended to decline in a number of cases. Where that value has not decreased, this has generally been because of the influence of projects financed by foreign donors. The two most important instances are World Bank-financed projects in Mali and Mauritania, which have significantly increased their material expenditures during the last few years. Although the figures for Niger cover only a brief period, they reveal an increase in real expenditure, doubtless reflecting that country's stronger fiscal position. In Senegal and Upper Volta, on the other hand, there has been steady decline since the early 1970's in the real value of those expenditures, though, as noted above, this may have been at least partially offset by increased expenditures within specific projects not included in the central government budget data.

Excluding external donor financing of animal health services within livestock projects, it appears that there has been a decrease in the real value of the operating budget for these services in every country except Niger. This has occurred partly because of generally tight budgetary situations, especially following the drought of the 1970's. It may have been also because priority has been given to maintaining the real value of personnel salaries in a period of considerable inflation.

Some people argue that the operating budget has been squeezed to allow for increased public sector employment. The data on animal health service personnel do not support this hypothesis. In most of the countries there has been relatively little increase in employment, especially at the bottom level, in the last ten years, although the upper levels have experienced upgrading of personnel.

TABLE 5.1- Animal health service budgeted expenditures
(million CFA francs)[a]

	1968	1970	1972	1974	1975	1976	1977	1978	1979
Current Prices									
Personnel									
Mali	n.a.	n.a.	128.0	160.0	177.4	187.6	213.4	234.8	256.8
Mauritania	70.2	78.3	82.2	n.a.	n.a.	161.0	163.9	160.6	169.4
Senegal	n.a.	254.3[b]	308.6	394.9	511.2	558.8	589.5	618.8	560.6
Upper Volta[c]	110.0	115.3	107.2	118.1	n.a.	166.3	207.9		
Material									
Mali	n.a.	n.a.	27.8	21.1	26.5	25.7	65.8	69.4	61.0
Mauritania	21.4	32.8	32.2	n.a.	n.a.	29.9	58.2	63.1	100.8
Senegal	n.a.	58.2[b]	62.4	84.2	97.8	92.6	94.4	85.5	98.0[d]
Upper Volta[c]	9.1	11.0	18.2	19.1	n.a.	20.5	21.1		
Constant (1975) Prices									
Personnel									
Mali	n.a.	n.a.	178.5	165.1	177.4	173.2			
Mauritania	122.1	124.5	111.5	n.a.	n.a.	140.7	129.9	118.9	119.5
Senegal	n.a.	440.7[b]	502.6	512.9	511.2	542.5	521.7	528.9	467.2
Upper Volta[c]	169.0	158.8	148.9	140.3	n.a.	181.6	170.8		
Material									
Mali	n.a.	n.a.	38.8	21.8	26.5	23.7			
Mauritania	37.2	52.1[b]	43.7	n.a.	n.a.	26.1	46.1	46.7	71.1
Senegal	n.a.	100.9[b]	101.6	109.4	97.8	89.9	83.5	73.1	81.7
Upper Volta[c]	14.0	15.2	25.3	22.7	n.a.	22.4	17.3		

Source: Annual general government budgets.

Notes: [a] Except for Mauritania in 1976 through 1974, for which budget figures expressed in local currency units have been converted to CFA francs at the original conversion rate 5 CFAF= 1 UM.

[b] Budgetary year 1969-70. In all other cases, the figures for Senegal are for the budgetary year starting in the year indicated.

[c] Includes relatively minor expenditures by the livestock department not directly related to annual health services.

[d] Includes an estimate of expenditures in the Cap-Vert Region based on expenditures in the previous year.

Some insight into the employment problem can be gained by looking at the ratio of material to personnel expenditures shown in Table 5.2.

TABLE 5.2 Ratio of material to personnel expenditures in animal health services (1970-78)

	1970	1972	1974	1976	1978
Mali	0.10	0.17	0.16	0.12	n.a.
Mauritania	n.a.	0.22	0.13	0.14	0.29
Niger	0.77	0.83	n.a.	0.19	0.40
Senegal	0.23	0.20	0.21	0.17	0.14

Source: Table 5.1

n.a. not available

Important differences between countries which largely reflect variations in geography are evident. Thus Mauritania and Niger with their widely dispersed herds and consequent need for mobility have higher ratios of material to personnel costs than does Upper Volta, where livestock are much more concentrated.[1] Also evident is Senegal's marked downward trend in this ratio in recent years, implying that an increasing number of higher-paid personnel have less and less means for performing their jobs.

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1 In addition, as was noted above, vaccines and medicines in Upper Volta are not paid for by the government and therefore are not entered as an operating expenditure.

Finally, Niger, with its relatively more favorable budget situation, exhibits a considerably higher ratio than the other countries.

It is possible to compile, from a variety of sources, rough estimates of the recurrent expenditure required per animal to ensure adequate health care. Adjusting these unit costs to reflect particular conditions in the different countries, the Working Group's livestock consultant multiplied them by reported herd sizes as of 1976 and projected the results to 1985. The figures for 1976 and 1985 are given in Table 5.3 along with actual recurrent expenditure in 1976.[1]

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[1] Details of these calculations are given in the technical report on animal health (cf. citation in Annex B).

TABLE 5.3 Estimated animal health care recurrent cost requirements for 1976 and 1985
(million CFA francs)

	Mali	Mauritania	Niger	Senegal	Upper Volta
Actual Expenditures in 1976	213.3	190.9	419.8	651.4	186.8
Required Expenditures in 1976	866.1	327.8	667.8	441.2	382.5
Required Expenditure in 1985	1,177.0	480.0	1,000.0	471.1	375.0

Sources: Actual expenditures are from Table 3. Required expenditures are estimated by multiplying the following costs per head of cattle times estimated total number of cattle: Mali 220 CFAF, Mauritania 250 CFAF, Senegal 180 CFAF, Upper Volta 150 CFAF. Total numbers for 1976 are taken from Communauté Economique de l'Afrique Ouest, Office Communautaire du Bétail et de la Viande, Colloque sur l'Approvisionnement en Viande de l'Afrique de l'Ouest, Document de Base, Abidjan: March 14-17, 1978. Projected numbers of cattle for 1985 are the same as the 1970 estimate contained in France, Ministère de la Coopération, Recueil Statistique de la Production Animale, Paris: Société d'Etudes pour le Développement Economique et Social, 1975.

These results suggest that animal health service budgets were deficient in 1976 in every country except Senegal. This deficiency was greatest in Mali, where actual expenditures were only about 25 percent of those required for full animal health care. To the extent that informal payments to veterinary agents existed, however, actual expenditures may have been considerably higher. Expenditures in Upper Volta appear to have been only about one-half those required, but if allowance is made for the fact that herders officially paid for all vaccines and medicines, there was little if any budgetary deficiency.[1] In Mauritania, on the other hand, where no official payments were made, actual expenditures were only about 60 percent of those required for good animal health care. Given the difficulty of delivering vaccines to animals in that country, this deficit may have been especially crucial. In Niger, expenditure amounted to 63 percent of the estimated requirement.

In Senegal, expenditures required for animal health care appear to have been exceeded. This does not imply, however,that care was adequate since, as discussed earlier, Senegalese expenditures were heavily biased towards personnel costs. What is required in Senegal, therefore, is not an increase in total budgetary disbursements, but rather a reallocation away from wages and salaries toward expenditure on materials.

The impact of inadequate animal health service budgets is illustrated by trends in the number of vaccinations administered (Table 5.4). The evolution of vaccinations and treatments since 1965 shows some strong contrasts. Most serious has been the decline in vaccinations in Mauritania, which has led in recent years to a rapid increase in outbreaks of rinderpest. Only a massive effort to vaccinate animals in the southwestern part of the country in 1978, as part of a project financed by the World Bank, led to a temporary increase in the number of rinderpest vaccinations. In 1979, however, only about 400,000 head of cattle are likely to be vaccinated against this disease, and even this will depend to a considerable extent on funds left over from various foreign aid projects.

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[1] There is some question as to the usefulness of vaccination statistics. On one hand, there may be over-reporting because not all vaccinations are made with vaccines which are viable and some animals may be vaccinated more than once. On the other hand, keeping of records takes time and not all vaccinations may be reported.

TABLE 5.4- Provision of selected animal health services
(thousands of vaccinations or treatments)

	1949	1965	1970	1972	1974	1975	1976	1977	1978
Rinderpest									
Mali	998	3,503	2,245	1,810	1,874		2,238	2,571	
Mauritania	366	988		377	712		636	571	800
Senegal	914	1,097	906	655	628	582	757	775	1,133
Upper Volta	709		379	414	1,246	783	421	337	
CBPP									
Mali	39	827	1,174	425	370		2,095	2,967	
Mauritania	8	678		317	241		267	355	160
Senegal	15	516	1,628	1,208	1,285	1,074	1,159	1,170	1,600
Upper Volta	8		257	174	1,196	770	438	343	
Trypanosomiasis									
Mali	n.a.	77	115	129	135				
Mauritania	n.a.	46		20	21		14	14	n.a.
Senegal	n.a.	11	8	14	16	16	31	15	24
Upper Volta	n.a.		331	715	443	374	644	684	
Internal Parasite									
Mali		1	3	5	7				
Mauritania		49		48	51		121	79	n.a.
Senegal		n.a.	19	13	49	900	750	18	53
Upper Volta			56	13	40	98	111	47	

Sources: France, Ministère de la Coopération, Recueil Statistique de la Production Animale, Société d'Etudes pour le Développement Economique et Social, 1975; annual reports of the government livestock services.

Notes: n.a. not available.

Despite severe budgetary problems, Mali appears to suffer less. Vaccinations against rinderpest are reduced below the 1965 level, but this is partly because only young animals have to be vaccinated. Nevertheless, the coverage rate in 1976 was only 46 per cent, substantially below the 80 percent or so which is desirable. More important in Mali have been recent outbreaks of CBPP. These appear to have been dealt with by vastly expanding vaccination against this disease, but the rate of coverage of 60 per cent is still too low since conferred immunity is limited in time and the animals must be vaccinated every year.

The number of vaccinations in Niger and Senegal dropped off during the mid-1970's, partly because the number of animals was reduced by drought but, in Senegal's case, also probably because of budgetary constraints. Coverage has recently been increased but still remains substantially below that which is believed to be desirable to assure protection of the herd.

Vaccinations in Upper Volta against the principal epidemic diseases, after peaking in 1974, have substantially fallen off in recent years and coverage rates there are very low (12 per cent). One reason for this is that the incidence of these diseases, and especially of rinderpest, has been very limited and herders are becoming less convinced of the value of paying for these vaccinations. On the other hand, treatment against trypanosomiasis, which is a greater problem in Upper Volta than in the other countries because of higher rainfall, has been maintained at a relatively high level.

In Senegal, except for a special program of calf protection that was carried out in 1975 and 1976, treatment against internal parasites has remained at a low level throughout the country. This may be partially due to herdsmen not being fully informed of the benefits of such treatment. On the other hand a factor that can be advanced with certainty is that the Senegalese animal health service prefers to concentrate its limited financial resources on the prevention of epidemic diseases.

2. Other interventions

While animal health constitutes the most important area of government intervention in the livestock sector, the state has become increasingly involved in recent years in production and marketing activities. Unfortunately given the recent character of such activities our knowledge of them is unavoidably limited.

Pastoral and range management projects. These projects are undertaken in cattle breeding areas such as the Sahel and involve some combination of water development, improved animal health care, better marketing arrangements, control over the numbers of animals grazed, and, in some instances, management of the rangeland. The projects vary markedly with respect to the rainfall zone in which they are located, the intensity of management and services provided, and the extent to which the public sector is involved in marketing. Being new for the most part, the projects are still benefitting from foreign financing and have not thus far suffered significantly from inadequate funding.

Nevertheless financial problems will arise once the donors have withdrawn, or at least reduced their support. The evidence suggests that herdsmen are willing to pay for medicines and supplementary feed rations even beyond what they are paying at present, however it is doubtful that they would agree to support a whole range of additional expenditures associated with the operation and maintenance of such projects--not only personnel costs of project managers and other government employees but also operation, maintenance and repair of buildings, vehicles, pumps and other equipment. The different costs can easily reach F.CFA 3,000-4,000 per head per annum (1976 prices). To generalize such activities over even a small percentage of the 17 million animals in the region would be financially prohibitive. Accordingly, such projects can be expected to exert a significant impact on livestock production in the Sahel only if ways are found of reducing their costs.

On-farm fattening projects. On-farm fattening projects can take several forms. In the simplest case, the farmer buys animals at the end of the rainy season and holds them for several months before selling them. During this period he maintains or even increases their weight through supplementary feeding. He makes his profit on the rise in livestock prices during the dry season. Alternatively, the farmer may hold animals for longer periods, possibly using them as work oxen. Supplementary feeding is again necessary to complete the growing out process and to maintain weight during each dry season. Animal manure helps to sustain soil fertility, and forage cultivation may eventually complete the transition to mixed farming.

Government actions in this area include the provision of extension services and credit for the purchase of animals, feed, plows and other supplies and equipment. Frequently, the animals are also insured by the government to protect against losses. Extension services are usually supplied free of charge. This is probably justified given the externalities involved and the need for learning in this area. Insurance may also be free to the farmer, at least during the early phases of a project, because of uncertainty regarding the degree of risk involved. Credit is subsidized less frequently, though as with other credit schemes, default and delayed payment can be a problem.

Often the government also sells animals to and purchases them from farmers. This helps to assure repayment of credit. Profits from these marketing activities can sometimes also be used to pay for part of the recurrent costs associated with extension and insurance, but only if the agency can maintain some monopoly power in these activities.

Thus far, lack of recurrent cost financing has not been much of a problem because on-farm fattening schemes are relatively new and are usually assisted by outside donors, which provide recurrent cost financing during the life of their projects. Given the success of these programs, however, they are likely to expand relatively rapidly, and the recurrent cost bottleneck could become increasingly severe.

The principal recurrent costs associated with on-farm fattening projects comprise wages, operation, maintenance and depreciation of equipment, credit, and extension. Part of these expenses can be covered by farmers' fees, as in Mali, but the uncovered remainer is often substantial. Though reliable data are scarce and experience is limited, it appears that recurrent costs per animal fattened may easily reach F.CFA 10,000 per year.

On the other hand two factors may be expected to help keep recurrent costs from getting out of control. First, at the outset of a project extension and insurance costs are relatively high per animal fattened because of the need for training and convincing farmers that this activity is profitable. Once the farmers have experienced success for themselves, they presumably should be able to pay for their insurance, and extension services can be reduced to a longer-term sustained level. The second reason why financing recurrent costs may not be too much of a problem is that many of these farmers will also be receiving advice from extension agents associated with agricultural programs. As noted earlier these programs often finance recurrent expenditures out of their profits resulting from the sale of cash crops. Since it is desireable, in any case, to have a single agent in contact with each farmer, extension services related to livestock should eventually be integrated with the agricultural schemes, thus making for lower costs.

Feedlots, ranches, and holding areas. These are designed primarily to fatten cattle before slaughter. They generally involve fairly strong central management with considerable overhead expenses and may have reasonably extensive physical facilities which must be maintained. Their income is derived from the difference between animal purchase and sale prices. Part of this difference is due to weight gain; another part may be due to substantial seasonal price fluctuation of which these operations take advantage. In some cases herdsmen and traders retain ownership of their animals, paying the project a commission.

Although these activities should be strictly commercial in nature, their relatively high costs are often not fully covered by income received so that they must be subsidized. Sometimes this takes the form of project assistance for what are essentially recurrent expenditures. In other cases, the operations take advantage of government activities elsewhere in the marketing chain which provide implicit subsidies. Cotton seed used as animal feed, for example, is often provided to government-owned feedlots by another government agency at a price which is well below the price which could be received if the seed were processed locally or exported.

Occasionally, these projects may have demonstration value and might therefore be subsidized while experience and information are being acquired. This learning period, however, is likely to be much more limited than for pastoral and on-farm projects. Consequently, these activities should soon be able to completely recover their recurrent operating expenses. If they cannot, they should not be undertaken.

Breeding stations. Stations have been established in most countries for breeding selected and improved animals and poultry. These are then sold to herders and farmers in an effort to upgrade the quality of their livestock. Some subsidization may exist and is probably desirable until the value of the selected and improved stock is well established. Thereafter, these activities should involve no recurrent costs to the government. The Working Group had no access to information concerning the net cost of these activities.

Marketing facilities. Frequently, governments invest in infrastructure designed to promote livestock marketing. This infrastructure may consist, for example, of wells, holding pens, loading ramps, and marketplaces.

Where collection costs are not very high, as with the major marketplaces, the amortization and maintenance cost of these facilities can be recovered without difficulty. Often, however, the facilities are located in remote areas of sparse population density, where collection of fees may be quite costly in relation to the amount of revenue collected. In some instances,

it may be possible to have fees collected and maintenance performed by local authorities. Where this is not possible, along stock routes in uninhabited areas for example, the government must provide for these expenditures.

We were unable to obtain information on the net cost of these activities to the governments of the Sahelian countries. Much of this cost is borne not by the livestock service but by the service responsible for water development (Eaux et Forêts). Since past practice has been not to charge for use of water, all recurrent costs associated with wells and boreholes must be paid for by this service.

Slaughterhouses and public marketing agencies. Where there is some development impact, as from acquisition of knowledge, these operations might be subsidized for a time, but over the long run they should not involve any recurrent costs not covered by their operating receipts. Unfortunately, this is not always the case, and continuing subsidies are common. The amount of these subsidies varies from country to country and from enterprise to enterprise. It is therefore difficult to generalize concerning their recurrent cost burden.

V.4 Alternatives for recurrent cost financing

The evidence presented thus far suggests that the Sahelian governments are finding it difficult to finance the recurrent cost requirements of their livestock services. The financial support which they have given to operating budgets, in particular, has declined in real terms over the past ten years. Yet cost requirements in several of the countries are likely to increase substantially in the near future. What can be done?

The major alternative to public financing of recurrent costs in the livestock sector is payment by the beneficiaries for these services. The practice already exists in some countries and is being extended in others. It is generally thought that the cost of medicines and vaccines against diseases which are only mildly contagious can be covered by user charges. Those who pay are also those who gain, and there is little problem of identifying who the beneficiaries are. It is also frequently argued, on the other hand, that continued public financing is necessary for animal health services designed to prevent highly

contagious diseases and that the benefits to society as a whole resulting from a reduction of contagion justify payment for these services by the public sector. Free provision of these services is held to be especially important if the vaccinations are compulsory.

This implicitly assumes, however, that private herders have the right to own potential receptacles of disease and that if the public sector wants to eliminate this danger, it must pay for it. An alternative interpretation of the distribution of property rights might just as easily be offered -- herders have a responsibility to the public to avoid harboring contagious diseases in their herds and it is they who must pay for ensuring that their animals do not contaminate other herds. The compulsory nature of vaccinations is irrelevant to who must pay for the cost.

Both Senegal and Upper Volta have experimented with payments by farmers and herders for vaccines and medicines. The results have been encouraging and have confirmed independent evidence indicating that livestock owners are quite willing to pay for the cost of animal health services whenever they are aware of the value of these services. It is important to continue educating owners as to that value, especially insofar as preventive vaccination and treatment are concerned. A part of this education process it might be desirable to subsidize certain health care services, such as treatment of calves for parasites, for a time, but eventually most of these services should be self-supporting.

The major exception to this is vaccination against epidemic disease, which may have relatively important external benefits associated with reduced contagion. In this instance, some sustained level of subsidization might be justified, considering the inverse relationship that may exist between the price of vaccine and the proportion of his stock that a herder submits to vaccination. It could be financed by including most of the fixed cost associated with each veterinary visit in the fees charged for other services. Some subsidy will be provided in any case by the salaries and other expenditures paid for out of the general budget, and fees charged for services should go primarily for the purchase and distribution of vaccines and medicines and for other local operating expenses including amortization of capital equipment.

Efforts should be made to reduce the cost of animal health care. One approach would be to reduce excess animal health service personnel, and to make greater use of locally trained vaccinators or assistants who are paid either by farmer or herder associations or out of the fees charged to the owners. Where top-level personnel are in short supply, as in Mali and Mauritania, on the other hand, costs can be reduced by increasing the number of trained personnel in this category, thus augmenting the efficiency of the service. A second approach to lowering costs might be to take advantage of economies of scale by combining together as many services as possible in a single visit and by improving cold storage capacity at the sector and sub-sector levels in order to reduce the required number of deliveries. Finally, the search should continue for technological innovations, such as heat-stable vaccines, which could substantially lower costs.

Fees charged for veterinary services should be established keeping in mind their relation to fees charged in neighboring countries. Distribution costs, as well as the cost of purchase, should be covered by these fees. Economic efficiency would be enhanced if higher prices were charged in more remote regions, but equity considerations may require that prices be established at uniform levels throughout each country. In this instance, savings on transport costs in more accessible areas should be used to subsidize delivery to more remote regions. It is probably unwise to try to control prices since controls would be difficult to enforce and would inhibit delivery of supplies to outlying areas.

Although centralized vaccination campaigns will probably be necessary for some time, these are basically in conflict with the goal of decentralizing responsibility for animal health care. As farmers and herders take on more of that responsibility, including its financial obligations, the campaign approach should be gradually phased out and replaced with a system of permanent veterinary posts responsive to livestock owners' needs. Furthermore, it may be possible to replace some of the functions of public campaigns with distribution by licensed and supervised private traders, thus placing less of a burden on limited public resources.

Pastoral and range management projects are relatively new and have generally been financed by external donors. Thus far, therefore, they have not suffered severely from the recurrent cost problem. The continued existence and extension of these schemes to cover wide areas, however, will require the development of some way of financing recurrent costs. Yet the extensive nature of these schemes makes recurrent cost recovery difficult and often expensive.

In addition, the benefits are not always easily quantified and there may be substantial externalities involved so that the social benefits exceed those which are strictly private. This is especially true where range management is designed principally to preserve or restore the natural environment. Furthermore, the experimental nature of most of these schemes today implies that much of the output is in the form of knowledge which can be passed on to others. Therefore, it is questionable as to how much of recurrent expenditures should be paid for by the direct beneficiaries. Nevertheless, herdsmen benefit from the pastoral and range management activities and should, therefore, pay at least part of the cost. This is generally recognized with respect to animal health services but is less so for access to water and pasture. There are indications, however, that the Sahelian countries are moving in the direction of requiring payment for these resources.

One of the major problems resulting from past water development in the Sahelian countries is overgrazing. Typically, when a new source of water has been made available there has been excessive grazing during the dry season and denuding of the rangeland in the vicinity of the water source. One solution might be to charge for the use of water and to adjust that charge so as to control the number of animals on the surrounding land. This charge would then both finance the cost of well maintenance and other services and control overgrazing. At the same time the difficulty of introducing charges for water and grazing, after a number of years during which these services were provided free of charge, should not be underestimated.[1] A learning period will be necessary before such recovery systems are ready to operate at full steam; we urge the donors to recognize the experimental character of this approach.

[1] There is a tradition in many Sahelian countries that water and pasture are free despite the fact that prior to colonial rule these were often taxed.

Other livestock sector activities pose less complex issues of recurrent cost financing than do pastoral and range management projects. Research and extension are probably best financed by government, whether out of general revenues or out of receipts collected at different stages of the chain of production and distribution of agricultural and livestock products (subject to reservation as regards the possibility of transferring part of extension activity to the private sector). In other cases the direct beneficiary may be required to pay a user charge for the government-provided service, although the price might well reflect a temporary element of subsidy insofar as the activity is at the outset experimental in character. As in the case of agriculture, the degree of success which the government is likely to enjoy in relying increasingly on user charges depends to a considerable extent on the prices at which the products are sold. At the present time the price of meat is legally controlled, in several Sahelian countries, at a level below that of the free market.[1] Whatever the social merits and political benefits of such a practice, it should be appreciated that the herder, like any other economic operator, bases his decisions regarding payments on a careful analysis of his profit and loss account.

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[1] Moreover, the free (parallel) market price of meat ends up being higher than it would be in the absence of price control. Traders are in effect obliged to tack on significant additional margins corresponding to the risks which they incur in selling meat "illegally".

TABLE 5.5

Recurrent cost requirements and recoverability for different livestock activities
(F.CFA per head of livestock, 1976 prices)

Type of activity	Required expenditure per head	Possibility of recovery
1. Animal health services		
Mali	220	
Mauritania	250	
Niger	250	high
Senegal	180	
Upper Volta	150	
2. Pastoral and range management	3000 - 4000	medium
3. On-farm fattening	10,000	medium
4. Feedlots and ranches	n.a.	high
5. Breeding stations	n.a.	medium
6. Marketing infrastructure	n.a.	medium
7. Slaughterhouses and public marketing agencies.	variable	high

n.a. = not available

Chapter Six: FISHERIES AND FORESTS

VI.1 Artisanal fisheries projects

1. Fisheries in the Sahel

Fishing is an important source of nutrition for the Sahelian population, providing it with an amount of proteins equivalent to that derived from livestock. According to the United Nations Food and Agricultural Organization (FAO), average annual per capita fish consumption in the mid-1970's was 15 kg, while consumption of meat amounted to 15.3 kg. Marine and inland fisheries not only constitute an abundant source of food for the Sahel -- the region's theoretical annual potential has been estimated at 2.6 million tons[1] -- but also represents a secure source of food in the event of prolonged drought. During the last drought the price of fish rose sharply under the impact of increased demand, and some groups in the Sahelian population, such as the Mauritanian nomads, foresook their ancestral food habits, based on livestock and agricultural products, turning to consumption of sardines, among other fish products. Finally, exports of fishery products to other regions of Africa and to Europe constitute a source of foreign exchange.

Senegal and Mauritania account for more than 85% of the region's marine fisheries output, while Mali and Chad share 90% of inland fisheries production.

2. Project case studies in Senegal and Mali

Two artisanal fisheries projects were included in the sample: the fishing boat motorization project in Senegal (FBM) and the Mopti fisheries project in Mali (MF). The FBM project relates to marine fisheries off the Senegalese coast, while the MF project comprises an inland fishery in the interior delta of the Niger River.[2]

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1 Club du Sahel: Stratégie et Programme de Lutte contre la Sécheresse et de Développement au Sahel, O.C.D.E., Paris, May 1979, pp. 70-74.

2 It may be noted that, during the rainy season, the Niger River inundates a vast region of Mali -- up to 54,000 km^2 in years of heavy rainfall -- thus creating an enormous lake that supports the reproduction and feeding of approximately 150 species of fish.

The FBM project was designed as a quasi-commercial operation; thus it can be said to have entered its phase of normal operation once the project's receipts and expenses are in balance. Included in Senegal's Third Development Plan (1969-73), the project's overall objective was "to accelerate the process of modernizing artisanal fisheries by upgrading their equipment and modernizing their environment". Implementation of the project was made possible primarily by financial and technical assistance from Canada, the Senegalese contribution consisting of land, buildings, and administrative, technical and support personnel. Implementation lasted from 1971 to 1976. At the present time, well into its normal operating phase, the FBM project has the following main functions:

1. ordering, receiving, customs clearance and storage of engines and spare parts for the fisherman;

2. Distribution of engines and spares through the fisherman's cooperative movement.

3. Management of sales proceeds of engines (on credit) and spare parts;

4. Management and organization of stores and workshops for engine repair.

According the the Working Group's estimates, the FBM project is responsible for having increased Senegalese fish production by between 14 and 24% from 1970 to 1973. In addition, it is estimated that the money income of a Senegalese fisherman who equipped his vessel with an outboard motor rose from F.CFA 150,000 to 240,000 in 1972 prices. Nor does the project's operation lack impact on the rest of the economy, in terms of both backward and forward linkages -- construction of boats, manufacture of fishery inputs, etc, as well as canning, manufacture of ice, distribution, etc . Finally, implementation of the project made it possible to adapt the technical specifications of the engines to local conditions, notably landing and unloading on sandy beaches as well as the salinity of tropical waters.

Given that the FBM project's operating expenses cannot properly be considered recurrent costs, since they do not represent a charge on the government budget, which, moreover, is not called upon to finance an operating deficit, since the project has succeeded in balancing its receipts and expenses, the question arises as to what this project has to tell us in regard to the recurrent cost problem.

In our view the FBM project conveys a double lesson. It shows clearly that:

i. if the functions that a project is to carry out are clearly defined, it may be profitable simultaneously from a financial and a socio-economic viewpoint;

ii. it is actually possible to limit a project's recurrent costs by decentralizing certain of its functions.

In the latter connection, for example, the managing authority (Centre d'assistance à la pêche artisanale or CAMP) does not employ directly the engine repairmen. Rather, it provides them with workshops and equipment, the repairman turning over 15% of his daily receipts to the project in order to cover current expenses such as electricity and maintenance. Thus, the CAMP circumvents the need to pay recurrent wages to the repairmen, especially in slack periods following the delivery of new engines, at the same time enabling them, against payment of fees, to utilize the workshops, even for repairs which they undertake on equipment not related to the project.

The fact that certain difficulties were encountered in both the implementation phase -- inappropriateness of the initial engine specifications for local conditions, insufficient supply of wood for boat construction, etc. -- and the operating phase of the project -- delayed repayment by the fisherman of engine purchase credits, delays in obtaining permission to import engines from countries outside the franc zone, e.g. Japan, etc. -- in no way detracts from the lessons which can be drawn from the project with respect to the search for

a solution to the overall problem of recurrent costs.[1]

The inland fisheries project in Mali, the Mopti Fisheries Project established by government decree in September 1972, was designed to increase the fish catch, improve methods of smoking and drying fish, combat insect pests of fish, organize and manage fish markets as well as fish processing and distribution, and promote and assist fisherman's associations. The project's primary functions include purchase, processing and sale of fresh fish, as well as communication of improved methods of preserving, training of fisherman, including literacy, and improvement of their conditions of health. In 1977 the Malian Ministry of Rural Development classified the MF activity in a group of rural development projects described as "not covering all expenses" but "having a good chance of attaining financial self-sufficiency within a few years." There is no reason for supposing the operation to be any closer to balancing its receipts and expenses in 1980 than it was in 1977. In 1978 expenses were 75% in excess of receipts. This deficit was financed, among other ways, by drawing on the annual depreciation allowance, which thus served, at least in part, to cover operating expenses rather than replace project facilities.

Similar to any other money-losing public enterprise, the MF project thus imposes a recurrent burden on the Malian government budget, which is responsible in the last analysis for its operating deficit. Although the inadequacy of the MF project's receipts may be in part attributable to external factors -- fishing practices which forestall replenishment of fish resources -- it nevertheless draws our attention to possible sources of operating deficits on the part of government projects: overly ambitious and diffuse initial objectives,

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[1] At the same time it should be noted that the extension of fishing boat motorization projects to other countries will doubtless require periods of implementation longer than the 4-5 years that were necessary in Senegal. Motorization of fishing boats in that country had commenced several years before implementation of the project, which was thus able to reinforce an existing trend towards modernization of equipment under conditions of, inter alia, fish price determination on a local market not subject to government controls.

confusion between financially profitable and social activities, and, finally, anachronistic regulation of tax and trading margins. Thus, the MF project includes among its principal sources of revenue the proceeds of a fish processing tax as well as rental proceeds from fish retail shops owned by the project and let to traders supplying the Mopti market. The processing tax, 9 malian francs per kg., has not increased since 1976, while the price of fish increased by about 25% from 1976 to 1977 alone. This rigidity in an upward direction has depressed the corresponding ad valorem tax rate from 1.71 percent of the price of fish in 1973 to 0.83% in 1977, leading to an obvious loss in project earnings. On the other hand the project's rental fee for fish shops supplying the Mopti market appears to be in general below private rental fees in the same market.

VI.2 Rain-fed forest plantation projects

1. Forests in the Sahel

In all the Sahelian countries, it has become obvious that efforts to expand agricultural production in search of food self-sufficiency must be planned in close coordination with the development of forest resources, both natural and artificial. Given a fragile ecological balance, which in many places has already been seriously disturbed, notably on the outskirts of urban areas, uncontrolled expansion of human activity hostile to nature in the countryside as well as the towns may lead to rapid deterioration of the soil, disappearance of water, changes in the micro climate, and even total desertification. The pressure to which the forest cover is being subjected is especially severe, inasmuch as wood plays a key role in domestic life in the Sahel. Wood is the sole source of energy for more than 90% of the population. The demand for wood for household use is far in excess of production and prices have evolved accordingly (families sometimes spend up to 30% of their income for firewood for cooking). The growing deficit is due to cutting of natural forests at an ever-increasing rate. The reduction of natural forest cover is especially evident around the large towns. In Bamako alone, fuel consumption, estimated today at 200,000 tons per year, is expected to reach 500,000 tons annually in 1990. Meanwhile the production potential of wood in the vicinity of Bamako is around 250,000 tons of which only half can currently be exploited given problems of distance and access.

Following the drought of the 1970's, international consultations under the aegis of the CILSS concerning the role of forests in Sahelian development programs have identified the following priority measures: increased production of firewood, protection of natural forests and reforestation zones against uncontrolled exploitation and brush fires, and establishment of a system of forest exploitation responsive to the needs of the population. It was also agreed that the forest services were not sufficiently organized and lacked logistical support. The lack of personnel was due not only to insufficient training facilities, but also to lack of funds to establish adequate forest management structures.

On the basis of these conclusions, a first generation of reforestation projects was initiated in the Sahel. These are now slowly beginning to yield modest results, after a number of problems and some failures. Efforts are underway to improve and expand these activities in the context of a second generation of projects in association with international development finance agencies such as the World Bank and the French Caisse Centrale de Coopération Economique.

Two programs of rain-fed forest plantations were selected for analysis of recurrent costs: those of Mali (Bamako region) and Upper Volta (Dagouma, Dinderesso and Gonsé).

2. Technical characteristics of establishment, operation and maintenance of rain-fed forest plantations

Artificial forest plantations are designed to ensure durable sources of wood supply and thus enable natural forests and brushland to avoid deforestation. The plantations can produce 5 to 10 times as much wood as natural forests. Thus, a continuous and adequate supply of wood from artificial plantations can contribute to reducing premature cutting of natural vegetation, curbing erosion and increasing both agricultural production and the volume of trees. On the other hand, investment and maintenance costs are relatively high, the technical and administrative supervision required are of a relatively specialized nature, and, moreover, the trees are, if not well maintained, natural prey to brush fires, clandestine cutting and disease. The life-cycle of a rain-fed forest plantation is estimated

at 24 years, after which the trees are felled and the terrain is cleared for new planting. During these 24 years, harvest of wood occurs several times, as a rule every 6 to 8 years, after which new offshoots appear and continue to grow until the final cutting in the 24th year.

The establishment of a plantation, i.e. its investment phase, occurs in the first year of the cycle. It consists essentially of the following steps: search for an appropriate location (soil quality, access, and proximity to markets are key factors); soil preparation (land clearing, tilling and compacting of soil); building of roads and fire-breaks; planting (staking, digging of holes and actual planting), an initial cleaning, as well as establishment of a system of protection and security. Maintenance in the first year is generally more intensive than that in the following years, comprising two thorough weeding operations.

The recurrent phase of plantation and maintenance begins in the second year: weeding and cleaning around the young trees, maintenance of fire-breaks and roads.

Apart from direct maintenance tasks, forest plantations require a certain amount of technical, administrative, and economic infrastructure which have a significant impact, even if indirect, on recurrent costs. Planning, technical management and tight security are especially important in the first year, but are also important even if less intensive in the following years, particularly for the sake of rapid and efficient control of brushfires as well as to ensure a certain level of protection against birds, animals and disease. A permanent infrastructure of applied research is necessary to analyze the soil as well as the performance of different species, and anticipate pest infestation. At the national level, the program requires overall management, financial administration, inventory control and planning, as well as a support system for activity in the field (comprising management of materials and supplies).

Finally, apart from requiring normal annual maintenance tasks and support structures at both the national and field levels, the plantation system requires suitable organization of the harvest and marketing phase.

3. Project case studies in Mali and Upper Volta

Available estimates for Mali of investment costs including first-year depreciation and maintenance give a figure of 0.3 million Malian francs or U.S. $686 per hectare planted (1978 prices). Recurrent costs of maintenance in the second and subsequent years amount to FM 14,030, or U.S. $32 per hectare (Table 6.1).

The corresponding figures for Upper Volta are higher -- F.CFA 0.2 million or U.S. $993 of investment costs per hectare, and F.CFA 17,000 or U.S. $77 for maintenance starting with year three.

Several factors explain the higher cost in Upper Volta as compared with Mali. The Voltaic savannah is more difficult to work, requiring more manpower and equipment hours than the more fertile regions around Bamako; the daily cost of labor is twice as high in Upper Volta, and the use of machinery, including depreciation, is likewise more expensive there; finally, the plants coming out of the nurseries cost approximately twice as much in Upper Volta as in Mali. It should also be noted that, for technical reasons, the organization of maintenance is more complex in Upper Volta than in Mali; thus, in Upper Volta initial maintenance extends over the first two years of the cycle while in Mali it is completed by the end of the first year.

In general, actual investment costs in Mali were close to required investment expenditure per hectare, although the reforestation program as a whole has not progressed at the design rate -- in 1978 and 1979 the Forest Development and Production Project planted 205 and 220 ha., respectively, as against 400 ha. planned for each year. On the other hand, actual recurrent maintenance expenditures were significantly below those regarded as necessary, the amount of the discrepancy varying considerably among plantations.

TABLE 6.1

Investment and maintenance costs per hectare of forest plantation -- Mali and Upper Volta

(1978 prices)

Category of expense	Costs per hectare			
	Mali		Upper Volta[1]	
	Malian francs	US $	F.CFA	US $
1. Investment (including first-year depreciation and maintenance)	301,970	686	218,010	993
2. Second year maintenance	14,030	32	23,700	108
3. Maintenance in the third and following years	14,030	32	17,000[2]	77
Recurrent cost coefficient (r):				
3./ 1.	0.047		0.078	
3./ 1. + 2.	n.a.		0.070	

n.a. - non applicable

1 World Bank norms

2 1979 prices

Exchange rate utilized: U.S.$ 1.00 = FM 440 = F.CFA 220

The discrepancy is explained by several factors: an excessive amount appears to have been spent on mechanical land preparation during the first year of the cycle; certain maintenance activities have proved to be simpler than anticipated; the firebreaks did not have to be maintained in the second year. Excluding one case, where maintenance expenses were less than the estimated requirement because the time available permitted only one weeding instead of two during the second year of the cycle, and assuming that certain essential tasks were not simply deferred, it thus appears that the recurrent maintenance expenditure requirement estimated for Mali as per Table 6.1 corresponds to an upper limit for the local conditions.

These local conditions reflect not only the existence of lower unit costs in Mali by comparison inter alia to Upper Volta, but result also from the presence of a particularly favorable ecological and human environment. As already mentioned, the soil is easier to work in the vicinity of Bamako than in the savannah; the lower population density around the forests reduces the need for security against poaching and illicit felling of trees; and the individual lots planted are not too far from one another. It should be noted, however, that the plantations included in the Malian sample are not necessarily representative of what is going on in Mali as a whole. The plantations studied are all managed by the Forest Development and Production Project (OAPF) under the Ministry of Rural Development, which operates on a quasi-commercial basis giving it control over the sales proceeds of its forest products, thus more or less protecting it from the pressures to which the government budget is subject. Finally, the existence in Mali of a Forest Fund which recoups 50% of tax revenue from forest, hunting and fishing activity ensures that at least part of these receipts are recycled in the forest sector.

The situation in Upper Volta is much more complex. Firstly, as already indicated, unit costs are higher than in Mali. Moreover, estimates of maintenance requirements are anywhere up to three times as high, although reasons for such discrepancies are not fully understood. Thus, certain plantations are well maintained (Gonsé, south of Ouagadougou) while others are currently undergoing rapid deterioration (Dinderessero, near Bobo-Diolasso) in the absence of precise maintenance norms. The Voltaic government being

the sole forest authority, certain plantations suffer from a lack of flexibility and speed in the allocation of funds budgeted for maintenance. Moreover, the environment is not always as favorable as in Mali -- at least compared with the Bamako region. Poor soil quality retards tree growth and favors eucalyptus, more resistant than gmelina but also more demanding in terms of maintenance; and high population density requires more intensive plantation security. In general, the current status of the Voltaic reforestation program calls for reconsideration of the mode of government intervention in the forest sector and enhancement of the commercial character of these activities, as with the OAPF in Mali.

With regard to prospects for the 1980's, the examples of the two forest programs studied show that the Sahelian countries can find themselves in significantly different situations. While Upper Volta is encountering basic problems of a technical and institutional nature, the main concern of the Malian plantations, or at least those of the OAPF, is to obtain a sufficiently remunerative selling price for wood, currently fixed by the government. As of November 1979, the cost of a load of wood (350 kg) delivered in Bamako was estimated at FM 2,170 while the wholesale price was fixed at FM 2,800, leaving the OAPF a grossly inadequate profit margin.

Chapter Seven: TRANSPORT INFRASTRUCTURE

VII.1 Introduction

From an economic as well as social and political viewpoint roads have traditionally been considered the most appropriate mode of transport in the Sahel, where a sparsely settled population is for the most part dispersed over large areas, and the major share of traffic consists of agricultural goods and persons. Particular geographical situations, such as that of the Cape Verde Islands, and the benefits associated with transporting especially heavy cargoes by rail, such as Mauritanian iron ore, constitute exceptions proving the rule. Moreover, the rail network will have to be extended in order to achieve the objectives set by the CILSS and Club du Sahel under the development strategy they have prepared for the region: in the medium term, to provide outlets for the agricultural production zones, and in the long run, to base development on opportunities for intraregional exchange rather than externally oriented growth depending essentially on markets outside the Sahel.[1]

Given the favored role of road transport in the Sahel, the present chapter focuses on analysis of recurrent costs associated with the existence and development of highway infrastructure. A final section is devoted to a brief examination of recurrent costs associated with other transport infrastructures, namely, railroads, ports and related installations of ocean, river and lake transport, and airports.

VII.2 Recurrent costs and road maintenance in the Sahel: preliminary considerations

To talk about recurrent costs of highway infrastructure is essentially to pose the economic issues associated with the problem of road maintenance. However, the different sections of this chapter, concerned with recurrent costs of road maintenance, do not constitute a program of highway maintenance for the Sahelian countries, augmenting the impressive volume of technical studies on

[1] See above, Chapter I, Section I.2.

this subject already available in the region. Rather, our primary intent is to:

a) provide the concept of recurrent costs proposed in Chapter Two with a sufficiently precise technical-economic content in the specific case of road maintenance (Section 7.3);

b) having supplied such content, to identify, at a Sahel regional level, the causes and problems associated with a level of road maintenance that all the evidence indicates to be insufficient (Section 7.4);

c) update country projections of recurrent expenditure requirements for road maintenance up to 1982-83, this being both the terminal year of the CILSS/Club du Sahel First Generation Program and the last year for which country projections of the road network are available (Section 7.5).

On the basis of conclusions drawn from analysis of points a) to c), we will be in a position to propose a set of recommendations to the Sahelien countries and international finance agencies whose implementation would enable the Sahelian governments more effectively to meet their road maintenance needs (see Part Five of the report).

However, before undertaking this analysis it seems appropriate to note briefly that the establishment and proper operation of a road network form part of a system of complex relationships whose solution must take into account multiple elements and interactions.

Construction of a new road or upgrading of an existing one to a technically superior level (such as paving a dirt road) gives rise to construction costs. Proper functioning of the road depends on maintenance with its associated expenditures. In the absence of adequate maintenace, the road deteriorates, giving rise to rehabilitation costs. The return on road construction, maintenance and rehabilitation is normally expressed in terms of cost savings which network users enjoy in the operation and maintenance of their vehicles. If road maintenance is viewed in isolation from construction and rehabilitation, the computation of its return must also, in principle, take into account the reduction which adequate maintenance brings about in future maintenance and

rehabilitation costs, as well as the avoidance of socio-economic costs resulting from closure of deteriorated roads.

While vehicle operation and maintenance costs are borne by private agents -- excepting, of course, government vehicles-- the costs of network construction, maintenance and rehabilitation are normally a charge on government. All expenditures, regardless of the category into which they fall, have a more or less significant foreign exchange component and thus affect the economy's overall capacity to import goods and services.

Planning the establishment and maintenance of a road network would be a relatively simple matter if the relationships among the different categories of expenditure that have to be considered all pointed in a single direction: i.e. network construction → network maintenance → vehicle operation and maintenance. This is, however, not the case; the quality of network maintenance affects the depreciation period for construction costs, the volume and composition of road traffic influence the choice among the different types of road to be constructed as well as the costs of maintaining any given type; etc. [1]

Finally, the real world supplies an additional degree of complexity insofar as road programs mix together the functions of upgrading and rehabilitation -- for example, when a badly maintained dirt road is "rehabilitated" by the addition of an asphalt surface.

VII.3 The technical-economic content of road maintenance costs

Strictly speaking, the only category of road expenditure that constitutes a recurrent cost burden for the government, including both the central government and local authorities, is maintenance per se.

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[1] The importance of interrelationships among road construction and maintenance expenditures and vehicle operating and maintenance costs was illustrated in 1965 by W.J. Betz ("Highway Maintenance Costs: A Consideration for Developing Areas", Highway Research Record, no. 94, 1965, pp. 1-27). These relationships have been formalized in the Highway Design and Maintenance Standards Model of the World Bank, which was presented by C.G. Harral and P.E. Fossberg at the Pan African conference on highway maintenance and rehabilitation held in Accra in November 1977 (communication entitled "Evaluating the Economic Priority of Highway Maintenance").

Highway engineers traditionally distinguish two types of maintenance: current maintenance, comprising tasks that should be carried out annually, even several times per year, and periodic maintenance, covering tasks which only have to be carried out every few years. A summary classification of these two categories of tasks relevant to Sahelian conditions is given in Table 7.1. Regardless of definitions used in the past by agencies providing aid to the Sahel and CILSS member governments, we suggest that both current and periodic maintenance give rise to recurrent costs.

Required annual current and periodic maintenance expenditure per kilometer of road (or unit recurrent cost) is a function of the rate of a road's deterioration. The rate of deterioration is itself determined by environmental conditions (climate, vegetation, topography), type of construction (paved vs. dirt roads, etc.), as well as traffic composition and volume. The relative importance of these different elements in determining unit recurrent costs is variable. Although no rigorous study exists on the subject, it is likely that the deterioration rate of Sahelian roads is less influenced by the volume of traffic using them than by the region's climatic conditions (rainfall concentrated in a short period of the year, sandstorms, etc). While some maintenance needs are closely linked to the rate of road utilization (filling of potholes, regravelling) the importance of other types is independant of utilization (cleaning of ditches and sign maintenance).

By way of illustration, Table 7.2 gives unit recurrent costs -- i.e. current and periodic yearly maintenance requirements per kilometer of road as recorded in 1977 and 1979 for seven of the eight CILSS-member countries, broken down by four road types: paved, improved gravel, ordinary gravel, and improved tracks. Ignoring possible differences in methods of estimating these costs among countries, inter-country variations reflect, for a given level of traffic, differences in environment as well as in distances separating sources of aggregate, supplies, and personnel from maintenance sites. Examination of Table 7.2 shows that unit maintenance costs are, in general, higher for the large enclave states -- Mali, Niger, and Chad, than for the small coastal countries -- The Gambia and Senegal. The size of Mauritania, which is a coastal country, and its difficult climate doubtless

TABLE 7.1

Current and periodic road maintenance tasks

Tasks	Frequency	Road Type
1. Quarrying of gravel for road work	C	G
2. Maintenance of gravel roads	C	G
3. Light grading	C	G
4. Heavy grading	C	G
5. Control of road corrugation	C	G
6. Maintenance of bridges and culverts	C	G, P
7. Sign maintenance	C	G, P
8. Cleaning of ditches	C	G, P
9. Regravelling	Pe	G
10. General maintenance of paved roads	C	P
11. Filling of potholes	C	P
12. Bituminous surface dressings	Pe	P
13. Shoulder repairs	Pe	P

Source: Directorate of Public Works, Upper Volta Ministry of Public Works, Transport and Urbanization.

Legend: C - current maintenance
Pe- periodic maintenance
G - gravel roads
P - paved roads

TABLE 7.2

Unit maintenance costs of the Sahelian road network, 1977 and 1979

(thousands of F.CFA/km/yr, net of taxes)

Country / Yr. of observ. / Road type	CHAD	THE GAMBIA	MALI	MAURI-TANIA	NIGER	SENEGAL	UPPER VOLTA
	1977	1977	1979	1977	1979	1977	1979
PAVED ROADS							
Current maint.	n.a.	n.a.	103	n.a.	152	n.a.	278
Periodic "	n.a.	n.a.	764	n.a.	450	n.a.	521
Total	992	312	867	875	602	500	799
(# venicles/day)	(100-200)	(100-200)	(192)	(100-200	(n.d.)	(370)	(30-500)
IMPROVED ROADS							
Current maint.	n.a.	n.a.	93	n.a.	280	n.a.	--
Periodic "	n.a.	n.a.	225	n.a.	234	n.a.	--
Total	415	262	318	407	514	165	--
# vehicles/day	(30-60)	(30-60)	(32)	(30-60)	(76)	(32)	--
GRAVEL ROADS							
Current maint.	n.a.	n.a.	n.a.	n.a.	80	n.a.	173
Periodic "	n.a.	n.a.	n.a.	n.a.	200	n.a.	201
Total	380	n.a.	n.a.	149	280	165	374
# vehicles/day	(10-30)	n.a.	n.a.	(10-30)	(less than 10)	(32)	(30)
IMPROVED TRACKS							
Current maint.	n.a.	n.a.	22	n.a.	n.a.	n.a.	61
Periodic "	n.a.	n.a.	113	n.a.	n.a.	n.a.	93
Total	145	45	135	68	n.a.	165	154
# vehicles/day	(max. of 10)	(max. of 10)	(17)	(max. of 10)	n.a.	(32)	(15)

Source: [1] Chad: LBI, Table 1.1.3/1. Level of maintenance described as intermediate.

[2] The Gambia: Table 1.1.3/1. Level of maintenance described as intermediate.

[3] Mali: Ministry of Transport and Public Works. Average daily traffic figures are for year 1976. Cost figures for 1974 updated to 1979, by means of an annual inflation rate of 10.15%.

[4] Mauritania: LBI, Table 1.1.3/1. Level of maintenance described as intermediate.

[5] Niger: BEN. Cost figures are those of 1974 updated to 1979 by means of annual inflation rate of 12%. Paved roads refer to two-lane highways.

[6] Senegal: LBI, pp. 8.18/19. Level of maintenance described as optimal.

TABLE 7.2 cont'd.

to average unit maintenance cost of level A improved tracks (roadbed consisting of selected material over most of its length) and level B roadbed consisting of selected material over discontinuous segments), the weighting being 34% for A and 66% for B. All costs correspond to a level of maintenance described as minimal.

Legend: n.a. = not available
- - = not applicable

Note: a) The citations for sources LBI, BCEOMHV, and BEN are given in detail in Section 7.5 below.

b) The number of vehicles per day is the level of traffic with reference to which unit maintenance cost has been calculated, and not necessarily the current level of traffic.

explain why its unit road maintenance costs exceed those of Senegal, another coastal country, even at comparable levels of traffic.[1]

Three inputs enter directly into the composition of unit maintenance cost: primary materials (bitumen, gravel, etc.), manpower and machinery services. Each of these three inputs has a more or less significant foreign exchange component: bitumen is generally imported ; some engineers employed by the national road maintenance services are expatriates, repatriation of part of whose salaries involves utilization of foreign exchange ; and all Sahelian countries purchase their maintenance equipment abroad. The problem of recurrent costs of road maintenance must therefore not be confused with that of local currency expenditure and must also be analyzed in the context of macroeconomic constraints relating to national savings and the balance of foreign payments.

While unit maintenance costs must serve as a basis for estimating recurrent budget and foreign exchange requirements of present and future road maintenance, it is also appropriate to note that, where machinery plays the essential role that it does in this sector, the services provided by maintenance equipment should be valued at their gross rental value, i.e. a level which attracts sufficient resources to operate, maintain and replace the machinery. It is also appropriate to include in unit maintenance expenditure an estimate of overhead costs required to finance the central government services associated with implementing the maintenance program on force account, or alternatively overhead costs of private entrepreneurs if maintenance is contracted out to the private sector.

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[1] We were able to compare the figures of Table 7.2, expressed in prices of 1977, with data expressed in 1979 prices for one of the countries in the region. The difference between the two cost levels is attributable essentially to the increase in the general price index between 1977 and 1979.

Sahelian officials in charge of road maintenance services are perfectly aware of the need to apply these rules in the computation of recurrent expenditure requirements. On the other hand, they are perhaps less conscious of the need to take into account the fact that, when maintenance is carried out on force account, eventual non-utilization of the government's maintenance equipment during part of the year, often as a result of lack of spare parts, embodies an additional cost which we suggest should be included in recurrent maintenance expenditure. This cost of under-utilization of maintenance equipment is doubtless taken into account in the bid which a private firm presents in response to a government tender for road maintenance service. Failure to take the cost of underutilization of equipment into account in estimates prepared by government agencies themselves thus leads to systematic bias in favor of maintenance by force account rather than contracting out to private enterprise. In this way, the Sahelian governments may be losing an opportunity to stimulate private sector activity in carrying out maintenance of the socio-economic infrastructure they have created.

VII.4 Inadequacy of road maintenance in the Sahel -- a regional inventory of causes and problems

Table 7.3 below gives the length and composition of the road networks of the Sahelian countries, with the exception of the Cape Verde Islands, in either 1977 or 1978. At the present time there is no index or set of indices with respect to the rate of highway deterioration calculated on a comparable basis for the different countries.[1] In some cases, evaluation of road conditions has been the subject of relatively detailed technical studies -- e.g. in The Gambia.[2] In other cases, such evaluation has been left to qualified opinions, expressed by public works engineers on the basis of field trips.

Nevertheless numerous sources of information consulted by the Working Group are unanimous in citing the generally poor maintenance of the Sahelian road network and, more specifically, the advanced state of deterioration of the lower road categories, especially agricultural feeder roads, whether gravel

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1 Measures of road deterioration have been proposed in AASHO Road Tests (National Academy of Sciences - National Research Council, Washington, D.C., 1962) and incorporated in the World Bank's highway network programming model (see IBRD: "Highway Design Study Phase I: The Model," Economics Department Working Paper no. 96. Washington, January 1971, chap.3).

2 Wilbur Smith and Associates: National Transport Study: The Republic of the Gambia, October 1978, final report, pp. 5-12 to 5-15.

TABLE 7.3

Development of the Sahelian road network 1977/78/79 - 1982/83

(all figures are in kilometers)

Country / Years / Road type	Gambie		Haute-Volta		Mali		Mauritanie		Niger		Sénégal		Tchad	
	1977	1982	1979	1983	1978	1982	1977	1982	1978	1983	1977	1982	1977	1982
Paved roads	272	534	857	1307	1656	2860	615	1939	1892	4276	2836	3586	253	343
Improved gravel roads	557	754			1757	2100	433	936	2387	1670	426	355	671	1141
Ordinary gravel roads			1964	2546			2066	1314	453	239	5023	4766	374	319
Improved tracks	1528	1069	4874	5465	2456	5457	1085	340	820	820	3975	5283	79	620
Ordinary tracks			2438	1090	7656	6771	2891	2598	2105	683	1482	932	5892	4997
TOTAL	2357	2357	10133	10408	13525	17188	7090	7127	7657	7688	13742	14922	7269	7420

Source:

1. Gambie: RPTG, Tables 1.1.4 and 1.3.8
2. Haute-Volta: for 1979: Ministry of Public Works, Transport and Urbanization; for 1983: BCEOMHV, Table 1.1/3 (excluding tracks).
3. Mali: for 1978: unpublished document of the Ministry of Transport and Public Works; for 1982=LBI table 5.4.1/1.
4. Mauritanie: LBI, p. 1.6-3 and Table 6.4.1/4
5. Niger: BEN, p. 1 (for 1978, paved roads include 272 kms. of one-lane highways.)
6. Senegal: 1977 paved roads and network total from Annex C of the complementary note to LBI volume 8 (LBI, p. 1.8-5 gives gravel roads and improved tracks, ordinary tracks being calculated as a residual); for 1982 -- Annex A of the complementary note to LBI volume 8.
7. Tchad: LBI, pp. 1.9-3 and 1.9-7.

or tracks. In some countries the situation had assumed dramatic proportions by 1977-78 and justified forceful measures which the governments concerned have adopted since that time in agreement with sources of international finance. In 1977 the Gambian government regarded only 20.2% of its paved roads as being in medium to good condition; the same percentage was only 4.1 with respect to gravel roads. In the same year, the Malian government estimated that 37.3% of its gravel roads had to be rehabilitated. Alone in the region, Niger seems to have kept its road maintenance at a more or less adequate level, notwithstanding the extra traffic imposed by the drought of 1969-74 and the inflation of maintenance costs particularly noticeable since 1971. An unpublished study by an international finance agency estimates that in the mid-1970's Niger was spending on road maintenance an amount only 2.7% below that corresponding to a minimum maintenance program. The same percentage was 8.96 for The Gambia, rising to 21.14 percent for a non-member country of the CILSS, Cameroon. It would, of course, be possible to come up with many more indicators of this nature. We believe that the figures presented above are sufficiently illustrative of the difficulty which the Sahelian countries are encountering in different degrees in satisfying the recurrent needs of road maintenance.

The following discussion proceeds on the assumption that poor road maintenance is "bad" in itself -- in other words, that it leads to sub-optimal utilization of the national capital -- and that better maintenance is synonymous with an improvement in general welfare. Some people see in poor road maintenance a rational response of the national governments to a condition of overinvestment in road construction. According to this view, road deterioration, i.e. disinvestment, represents a step towards optimization insofar as it releases budget resources initially allocated to road maintenance for other uses (health, education, agroindustrial development). But actual observation does not confirm this viewpoint. On the basis of road maintenance projects financed by it in developing countries, including West Africa, the World Bank has calculated internal rates of return for these projects ranging between 20 and 118%, with an average of 63%.[1] These are high rates, the average equalling at least 3 times the social opportunity cost of capital. They clearly reflect the profitability of relatively small expenditures, in relation to the initial investment, devoted to maintaining the services expected from the latter at an adequate level. There is no escaping the conclusion that it would be in society's interest to allocate

[1] C.G. Harral and P.E. Fossberg, op.cit., 1977, p.2.

additional resources to road maintenance.

What, therefore, explains the difficulties the Sahelian countries have faced and concinue to face in meeting the maintenance needs of their road networks, these comprising, as already noted, the infrastructure of the region's preferred mode of transport?

Five major categories of factors have been suggested to explain the low capacity of the Sahelian countries to maintain their road networks:

a) the countries' very limited endowment in terms of government receipts, foreign exchange and specialized personnel;
b) technical-economic constraints on the choice of maintenance techniques in the Sahel;
c) the attitude of national governments toward road maintenance;
c) the attitude of international finance agencies toward financing recurrent maintenance costs; and
e) insufficiency of technical-economic information.

Deficient management of road maintenance services is often cited as a separate factor. However in our view this reflects above all the shortage of qualified personnel and absence of technical-economic information, i.e. factors a) and e) above.

Formulation of recommendations to enchance the Sahelian countries' capability for meeting their road maintenance requirements must be based on as careful and detailed an examination as possible of these major categories of factors.

1. Inadequate endowment in government receipts, foreign exchange and qualified personnel.

At the present time five Sahelian countries maintain road funds (Chad, Mali, Mauritania, Senegal, and Upper Volta). Whatever the institutional differences, the principle underlying establishment of a road fund is that roads should "pay for themselves". A certain proportion of revenues collected from road users in the form of specific taxes, primarily the fuel tax, is allocated to expenditure requirements for construction and maintenance. The existence of a road fund outside the national budget guarantees, at least in principle, that these particular local sources, supplemented by foreign

aid for highway development, are not allocated to other objects of government expenditure. Historically, road funds have enjoyed indifferent success in both developed and developing countries, with the exception of the United States.[1] Particularly in countries with a strong central executive branch it has proven difficult to maintain the integrity of the fund. The Sahelian countries fall into this category; considering in addition the structural weakness of their tax systems, it is not surprising that the existing road funds have not always fulfilled, and will not necessarily fulfill in future, the expectations of their founders. In Chad, for example, up to 1976 the law establishing the road fund stipulated that all taxes on gasoline and diesel oil should be allocated to financing the fund and to this end deposited in a special account in the Treasury. In fact, it is estimated that only 50% of the receipts from these taxes was so deposited.

In general, government revenue originating from highway use -- not only fuel taxes, but also vehicle registration and inspection fees and customs duties on imports of spare parts and lubricants -- are relatively substantial (representing 8% of Chad's government revenue during 1971-75) and in several countries would suffice even without foreign assistance to finance the entire road maintenance budget and even a substantial share of road construction to boot.[2] Clearly both the size and relative ease of collection of these government revenues makes them an ideal source of finance for projects which the government wishes to carry out in sectors other than transport. For example, in Upper Volta it is reported that 59 % of fuel taxes was supposed to be channeled into road maintenance; in fact, only 40-50% of these taxes were allocated to the road program, where the money was divided between construction and maintenance.[3]

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1 N.G. Yucel: "Toll Financing of Highways: Economic and Financial Considerations," IBRD staff working paper n° 187, Washington, D.C., p.22 (undated).

2 This statement must be qualified to the extent that rapid overall inflation is encountered, as at present, since these taxes and fees are frequently set in specific rather than at ad valorem terms (i.e., number of CFA francs per litre of gasoline purchased rather than as a percentage of the unit price)

3 Such situations may be interpreted as typical examples of a situation where the economic or opportunity cost of earmarked financial resources, in the present case allocated to the road fund, is so high, given other priorities, that the government finds itself obliged to reallocate the resources in favor of those priorities, thus violating the integrity of the road fund.

The conclusion suggested by these examples, supported by a wider range of historical experience, is not that existing road funds should be abolished, or that new ones should not be created. The existence of a road fund draws attention to the need for regular financing of recurrent costs of maintenance, whose deferral leads, for technical reasons, to significant additional costs, as will be shown later. Road funds also provide some assurance to international finance agencies with regard to the allocation of aid resources. They will continue to serve a useful role in this connection, and may even help to attract foreign aid that would not have been forthcoming in their absence. Indeed, at the present time, international finance is provided in a number of cases for road construction and maintenance in the Sahel on the express condition that a road fund be established or maintained outside the national budget. On the other hand, road funds will not solve the central problem facing the Sahelian countries with respect to operation and maintenance of development projects in general, which is their weak taxing capacity.

Road maintenance is costly in terms of foreign exchange. Table 7.4 shows that foreign exchange requirements of the Sahelian road maintenance program proposed to the CILSS and Club du Sahel in 1977 by Louis Berger International-Ingecot (hereinafter LBI) amounted to more than 50% of the projected total maintenance budget, the lowest country figure being 51% for Upper Volta and the highest 88% for Mauritania. These percentages generate a significant burden on the countries' export receipts for purposes of road maintenance.

The consultant LBI also prepared an inventory of the personnel assigned to road maintenance in each Sahelian country as of 1977, along with a projection of training requirements for administration and management, repair shops and field stations during the period 1977-82. The resulting estimates (Table 7.5) suggest that the constraint posed by availability of specialized manpower, skilled and semi-skilled, has affected the Sahelian countries in different degrees with respect to implementation of their maintenance programs, whatever the margins of error associated with individual figures. Overall, Chad, The Gambia, and Mauritania, in whose cases the projections call for an increase in personnel of more than 100% between 1977 and 1982, are doubtless suffering from a severe shortage of specialized maintenance personnel; Niger and Upper Volta, with required increases between 50 and 100%, find themselves in the middle of the group, while Senegal and Mali, requiring increases not exceeding 40%, face less severe shortages, with the exception that the consultant LBI suggests a five-year increase of 56% with respect to repair shop personnel in Mali. Table 7.5 also underlines the heterogeneity of

TABLE 7.4

Foreign exchange as a proportion of road maintenance costs in the Sahel

Country	%
Chad	73
The Gambia	51
Mali	69
Mauritania	88
Niger	69
Senegal	54
Upper Volta	74

Source: LBI, p. 1.1-5.

TABLE 7.5

Road maintenance personnel available in 1977 (P) and required for 1982 (P') in the Sahelian countries (number of individuals)

	The Gambia			Upper Volta			Mali			Mauritania			Niger			Senegal			Chad		
	P	P'	Δ [%]	P	P'	Δ [%]	P	P'	Δ [%]	P	P'	Δ [%]	P	P'	Δ [%]	P	P'	Δ [%]	P	P'	Δ [%]
Administration and Management staff	16	17	6	28	68	143	232	304	31	43	79	84	140	231	65	75	105	40	46	92	100
Repair workshop personnel	97	208	114	158	227	44	215	335	56	36	103	186	170	220	29	338	412	22	120	219	83
Field station personnel	35	103	194	340	543	60	525	702	34	175	346	98	436	696	60	625	746	19	158	364	130
TOTAL	148	328	122	526	838	59	972	1341	38	254	528	108	746	1147	54	1038	1263	22	324	675	108

Legend:

$$\Delta = \frac{P' - P}{P} \cdot 100 = \text{required percentage rate of staff increase, 1977-82.}$$

Source: BBI, annexes 1.10.1/2 to 1.10.1/8

maintenance personnel requirements in the different countries. For example, while Mali and Mauritania are particularly short of repairmen, Chad and Niger are primarily short of field staff. In 1977 Upper Volta was facing urgent requirements for administrative and management staff, while the Gambia's requirements in this category were virtually already satisfied, notwithstanding its severe shortages in the other two staff categories.

Insufficiency of government revenues and qualified personnel, together with limited import capacity, has led not only to a deterioration of the Sahelian road network, but also to underutilization and deterioration of government-owned road maintenance equipment. Officials of several of the region's national road maintenance services have no hesitation in describing the road maintenance problem as essentially a problem of access to an adequate and regular supply of spare parts, fuel, and other inputs required for operating and maintaining road maintenance equipment. It is only very recently that Mali inserted in the budget of its road fund an annuity corresponding to the replacement value of its maintenance equipment in 1978 prices, with the intention of increasing the amount each year to take account of inflation. As of 1979 Upper Volta was still engaged in computing equipment rental rates that would allow it to provide realistically for maintenance and replacement requirements of road maintenance equipment. Niger was the only country in the region that could count in 1980 on a completely renovated fleet of maintenance equipment.

2. Technical-economic constraints on choice of road maintenance techniques in the Sahel

It is frequently alleged that developing countries build, maintain and operate their projects using techniques that are in general too intensive in skilled manpower, capital and foreign exchange, and make too little use of unskilled manpower and local inputs. According to this viewpoint, heavier utilization of techniques more intensive in unskilled manpower and local inputs would reduce unit construction and maintenance costs and/or lead at least in principle to economies in the use of scarce resources, which in these countries comprise skilled manpower, capital and foreign exchange. Sharing these concerns, the International Labor Organization has served up a veritable menu of techniques intensive in unskilled

manpower, applicable a priori to road construction and maintenance, supported by illustrations borrowed from the experience of Southeast Asia and East Africa -- not, it should be noted, West Africa.[1] For their part the members of the Development Assistance Committee "recognize that adequate external financing of recurrent costs may be necessary...to encourage or, in any case, not to discourage, the selection of projects and techniques which make full economic use of available local human and material resources; and in this way, to contribute to productive employment and the satisfaction of basic human needs."[2]

What is the potential in the Sahel for utilizing road maintenance techniques intensive in unskilled manpower, with a view to reducing recurrent costs of maintenance and/or economizing on use of scarce factors (foreign exchange, capital, and skilled manpower)? The response given to this question in different countries is far from encouraging, as shown by the following selection from answers recorded by the Working Group:

> "Road maintenance will not be carried out to the detriment of road quality"
>
> "It is expansion of agro-industrial activity, and not road maintenance, that must resolve the employment problem"
>
> "Greater use of unskilled manpower increases the need for skilled manpower to carry out training and work supervision"
>
> "The period of initiation of road maintenance activity coincides with the end of the rainy season, i.e. with a period when the peasant is relatively well off and accordingly has little interest in finding an alternative source of income"
>
> "The multiplication of agricultural production projects requiring maintenance by the peasants -- for example, cleaning of irrigation ditches -- has already raised problems with regard to manpower availability; little manpower is thus left over for road maintenance. Moreover, these same agricultural production projects are supposed to prolong the calendar of agricultural activity as such, thus reducing still further the availability of seasonal labor"

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1 M. Allal and G.A. Edmonds (in collaboration with A.S. Bhalla); Manual on the Planning of Labour-intensive Road Construction, ILO, Geneva, 1977.

2 O.E.C.D.: op. cit., November 1979, p.201.

Only The Gambia has expressed, to some extent, a differing opinion via the views of an engineer responsible for maintenance of agricultural feeder roads, who expressed satisfaction with road maintenance work carried out by petty contractors.

The responses given above were obtained from experienced individuals familiar with both the general organization of maintenance activity at a national level and the difficulties encountered in daily implementation, on the ground, of the corresponding tasks. Nevertheless, the importance of the question raised merits additional analysis.

The World Bank Transportation Department has concluded, on the basis of a detailed study of possibilities for substituting manpower for equipment in road construction and maintenance, taking as the cost of labor the maximum daily agricultural wage of U.S. $1.00 prevailing in those countries in 1975, that among the countries of the Sahel, Chad, The Gambia, Mali, Niger and Upper Volta could reduce unit costs by utilizing more labor-intensive techniques of construction and maintenance for selected tasks.[1] At the same time the study emphasizes the Sahelian governments' lack of experience in the use of such methods, and expresses reservations about possibilities for implementing them in the least densely populated regions. Moreover, World Bank experience indicates that past substitution of manpower for equipment has not, in general, reduced unit maintenance costs except where farmers were available for maintenance work, without having to be transported by vehicle, at an average of one for each mile of road length, and where the necessary aggregate could be extracted on the work site. While these conditions may be met, for example, in certain regions of East Africa and Southeast Asia, they rarely hold in the Sahel. Available data indicate that deposits of aggregate are separated from one another by an average of 5 km in Mali, indicating an average maximum distance of 2.5 km. for transport of aggregate; while for Senegal the corresponding figures are 10 and 5 km respectively.

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[1] World Bank, Transportation Department: "Study of Labor and Capital Substitution in Civil Construction (background material)", Washington February 1978, Mimeo, annex II, pp. 1-4. See also communication by I.K. Sud, C.G. Harral and B.P. Coukis: "Scope for the Substitution of Labour and Equipment in Civil Construction: a Progress Report," Indian Roads Congress, 37th Annual Session, Bhopal, December 1976, (proceedings, New Delhi, February 1978, pp. 1-74).

Such distances do not favor non-mechanized transport of aggregate.

On the other hand, and here we refer once more to World Bank experience, substitution of manpower for equipment is supposed to have successfully reduced, in several developing countries, the relative share of foreign exchange in unit maintenance costs.

Available evidence suggests, in other words, that low population density, long distances between deposits of aggregate, the attitude of local governments and the need for extensive training of unskilled manpower, given the present structure of relative prices for maintenance inputs, do not favor the adoption in the Sahel of labor-intensive techniques for road maintenance. In the countries regarded as having an a priori interest in adopting such techniques for selected tasks, i.e. Chad, The Gambia, Mali, Niger and Upper Volta, their use would not affect the total recurrent maintenance budget but rather reduce the share of foreign exchange in a unit maintenance cost that would remain constant in real terms.

These conclusions are not intended to prejudge the results that might be forthcoming from more detailed studies of one or another country, such as a study currently underway on this subject in Mali with the cooperation of the ILO. Nor do they necessarily apply to particular situations such as the Cape Verde Islands, where aggregate of volcanic origin is in abundance throughout the territory, southern Chad with its relatively denser population than the rest of the Sahel, or southwest Upper Volta, where an experimental labor-intensive maintenance project is currently underway.

3. Attitudes of national governments regarding road maintenance

The relative importance assigned by Sahelian governments to road maintenance is a complex question whose different facets are difficult to quantify. Given a particular endowment in factors of production, the issue encompasses, on the one hand, the choice which a government makes between maintaining existing roads and constructing new ones and, on the other hand, the choice between allocating public funds to road maintenance vs. development and operation of other sectors of government activity (education, health, national defense, etc.)

An inter-country, intersectoral comparison of the relative discrepancies over a considerable period of time between the different sectoral ministries' budget submissions for investment and operating funds and the amounts actually allocated to them would throw a certain amount of light on this problem of choice. Because of lack of access to the required statistical data, we have not been able to carry out such a comparison. Given the data one could not eliminate entirely external factors such as choices which are sometimes imposed by external finance agencies.

In other words, in the absence of additional data, what one finds on examining past trends in road maintenance expenditure in the Sahelian countries -- fluctuations from one year to another (Chad, The Gambia), stagnation (Upper Volta) or decline (Mauritania, Senegal) -- serves more as an indication of difficulties in implementing maintenance tasks in the face of a general shortage of resources, than of a lack of interest on the part of the local authorities in this kind of activity.[1]

We found only one case in which the history of negotiations between a Sahelian country and a foreign aid agency favorably disposed to financing recurrent costs showed a marked preference on the part of the local authorities for extending a road in lieu of maintaining an existing segment. Possibly other cases exist.

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[1] Fluctuation of actual maintenance expenditure, even if it is around a rising trend, gives grounds for serious concern. On account of technical requirements, road maintenance should be carried out with a high degree of regularity. Only a few isolated maintenance tasks such as trimming of vegetation can be reduced or delayed without leading to a costly increase not only in future expenditure requirements for maintenance and rehabilitation, but also operating and maintenance costs of user vehicles. A numerical example given by M. Allal and G.A. Edmonds (op. cit., p. 158), shows that irregular as compared with regular maintenance over a period of ten years can increase the cumulative, undiscounted amount of such costs by about 20 percent.

While the available data do not warrant a conclusion that the Sahelian governments consider it more prestigious to build roads than maintain them, one can nevertheless cite a number of cases where governments have underestimated the tendency of certain economic policy measures to increase maintenance costs. For example, whenever too low a ceiling has been set on road transport tariffs -- i.e. at a level where receipts do not cover full costs -- the transporters have tended to overload their vehicles, thus accelerating road deterioration and, accordingly, increasing unit maintenance costs.[1]

4. Attitudes of international finance agencies toward road maintenance.

Relative to the general principle that donors are readier to finance investment than operation and maintenance costs,[2] given the peculiar characteristics of road maintenance this activity appears to benefit from special, even privileged treatment by international finance agencies.

Road maintenance, at least in the Sahel, is capital-intensive. Purchase of maintenance equipment represents capital formation and is thus eligible for international finance. Use of the equipment requires regular purchase of spare parts which, although a current expenditure, is as much a foreign exchange cost as purchase of the equipment itself, generating donor country exports.

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1 The delicate and complex problem of vehicle load standards (P.E. Fossberg: "Road Freight Transport Problems with Special Reference to Developing Countries," Symposium on heavy loads and their effects, O.E.C.D., Paris, 1977) is currently receiving the attention of the Communauté Economique de l'Afrique de l'Ouest(CEAO), of which five Sahelian countries -- Mali, Mauritania, Niger, Senegal, and Upper Volta -- are members. Upper Volta is also in the process of considering the possible benefits of introducing a system of road tolls designed in the first instance to discourage overloading of vehicles, including those in transit between Niger and ocean ports.

2 See below, Chapter XIV.

As shown by a detailed examination of DAC-member-country statements of intent on recurrent cost financing[1], purchase of imported spare parts offers possibilities for international finance. In addition, periodic as opposed to current maintenance, insofar as it is recommended for intervals no shorter than five years, can be incorporated in capital formation. In this connection the World Bank, for example, allows certain periodic maintenance costs to be financed out of its loans and credits. Finally, allocation of funds among different components of a national road program, i.e. construction, upgrading, rehabilitation and maintenance, is normally flexible. Thus, foreign aid provided for the specific purposes of road construction, upgrading, or rehabilitation simultaneously increases, to a certain extent, overall capacity for maintenance.

It is thus not surprising that the CILSS/Club du Sahel First Generation Program had recorded, as of the end of 1979, a nominal commitment rate for the transport and infrastructure sector, most of whose projects comprise road maintenance and rehabilitation, generally higher than for other sectors.[2]

Nevertheless, an investigation into factors underlying insufficient allocation for road maintenance by international finance agencies must also take account of practical difficulties encountered in implementing road maintenance projects once foreign financing has been obtained. For example, it is very difficult to evaluate *a priori*, when a private firm submits a bid to supply road maintenance equipment, what will be its capacity and willingness to provide after-sales services in the country. One Sahelian country has complained bitterly over having obtained maintenance equipment from low-bidding firms in a DAC-member country, after which they were unable to obtain an adequate supply of spare parts. Another difficulty arises from the delay which separates evaluation of a program's needs from its implementation; it frequently happens

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1 See below, Chapter XIV.

2 Source: CILSS - Club du Sahel: *Etat d'Avancement des Projets de Première Génération*, Sahel D (79) 47, December 1979, p. 111.

that inflation and contingency allowances are inadequate to prevent cost overruns, necessitating either an additional aid allocation to the initial program, or an additional appropriation in the host country's budget. Another problem frequently encountered in practice is irregularity in the supply of spare parts, with especially adverse consequences for current maintenance, increasing eventual rehabilitation needs as well as road user costs.

5. Insufficiency of technical-economic data

Technical-economic information for road maintenance should facilitate, on the one hand, detailed planning of temporal and spatial allocation of human and material resources for maintenance tasks, and, on the other hand, accurate projection of budget requirements in terms of foreign exchange and personnel. At a national level this data relates essentially to:

a) length of the road network and its composition by technical categories (above, Table 7.3);

b) volume and nature of road traffic;

c) environmental conditions (topography, soil structure, climate, etc.);

d) unit costs of road maintenance on force account and by private contractor; and

e) vehicle operating and maintenance costs.

As already indicated, the different categories of information are not independant. Data types a), b), and c) serve to measure the rate of road deterioration which in turn generates, in principle, recurrent expenditure requirements for maintenance, i.e. data type d). Data type e) must be taken into account in calculating the internal rate of return of a road maintenance program.

Apart from data required at a national level, information is required from international sources not only on prices of road maintenance equipment from foreign suppliers, but also regarding their capacity and willingness to supply the after-sales services required for operation and maintenance of the equipment. There is no need to repeat this important point in the present context.

The following discussion will consider briefly the reasons for inadequacy of data types a), b) and d), as well as the possible impact of this lack of information on unforeseen increases in recurrent costs of road maintenance in the Sahelian countries.

Three concepts of the road network are current in the Sahel: the total network, the network classified by road types, and the effectively maintained network. Few countries distinguish carefully among these three concepts. In several cases information is available only on the classified and maintained networks, minus details on the quality of this maintenance. The level of ignorance naturally increases as one moves from paved to gravel roads and tracks, the latter nevertheless contributing the most to opening up agricultural production zones. This complicates the task of obtaining reliable estimates of maintenance expenditure requirements and/or justifying, from a socio-economic viewpoint, the percentage of the network which the government is committed to maintaining, considering the constraints which face the economy in terms of government revenue, foreign exchange and skilled manpower.

The volume and nature of road traffic are key factors in the rate of road deterioration, and hence in the determination of unit maintenance cost. As a rule, Sahelian countries possess data on traffic volume (number of vehicles per day) over different types of road, but information on traffic composition is scarce (e.g., in terms of light vehicle-equivalents).[1] Tests carried out in industrial countries -- for example, the AASHO test in the United States -- show that the rate of road deterioration increases exponentially with

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[1] Upper Volta and The Gambia are exceptions to this.

vehicle weight. It should be emphasized that planning of maintenance budgets is difficult without such information; in economies with rapidly-growing transport requirements, it is often the level of a road's maintenance that determines the volume and composition of the traffic using it. In this connection, past experience may be a poor guide to estimation of future maintenance requirements. Apart from this problem the Sahel also has to deal with substantial seasonal variations in traffic, which is at a peak during the agricultural harvest.

There are two problems associated with unit maintenance cost data: firstly, the degree of utilization of this information in preparing maintenance programs, and, secondly, the method of computation for measuring costs.

For example, the directorate of public works of a Sahelian country has been collecting for several years, via its regional services, detailed information on maintenance costs broken down by road types and regions of the country, and within those categories, by types of tasks and inputs (aggregate, manpower services, and services of equipment). At the time of budget preparation, the agency pools all this information to obtain maintenance expenditure requirements for the different types of road, multiplying these by estimated total length in kilometers to obtain the total maintenance budget. Meanwhile the method of calculation has caused all information on the structure of costs, broken down by inputs and reflecting regional cost differences, to fall by the wayside. Preserved in an operational format, this information would make it possible to better appreciate the burden which maintenance imposes on utilization of the nation's scarce factors of production, as well as to estimate the costs of maintenance activity in isolated regions of the country.

With regard to computation of unit costs, we have already stressed that lack of homogeneity in public and private accounting practices, notably as concerns treatment of the cost of underutilizing capital, threatens to distort the process of deciding which maintenance jobs are to be carried out on force account and which by private contractors.

At the same time, the search for more complete technical-economic information for road maintenance must be approached with caution. Collection of data is itself a recurrent cost which tends to absorb highly qualified manpower in limited supply. None of the Sahelian countries is currently in a position, even with technical assistance, to establish a comprehensive, sophisticated system of data collection that could be assured of viability in the long run. Thus, it is essential to establish clear priorities in information gathering.

VII.5 Recurrent cost projections of road maintenance in the Sahel

1. Sources

The only projection of expenditure requirements covering all the Sahelian countries has been carried out by Louis Berger International Inc. (LBI) and Ingecot on behalf of the CILSS transport and infrastructure working team. Entitled "Diagnostic Study of Road Maintenance in the Sahel" and dated March 1978, the report covers the period 1978-1982.

For three CILSS member countries, Chad, Mauritania and Senegal, there exists, as far as we know, no revision of the LBI projections in the form of "Complementary Notes" incorporating corrections requested by the various governments. In contrast, the governments of The Gambia, Mali, Niger, and Upper Volta have made new expenditure forecasts differing from LBI's principally in regard to assumed unit maintenance costs and assumptions about the length and composition of the network to be maintained, as well as the frequency of periodic maintenance tasks. The sources for these four countries' projections are:

a) "The Gambia: A Study of Road Maintenance Operations," September 1978. Study carried out for the Gambian Ministry of Public Works and Communications by RPT Economic Studies Group, covering the period 1978-1982 (hereinafter RPTG);

b) the report of phase II of the "Etude de l'entretien routier en Haute Volta," June 1979. Study carried out for the Upper Volta Ministry of Public Works, Transport and Urbanization by the consulting group

BCEOM, covering the period 1981-83 in the medium term and 1981-1990 in the long term (hereinafter BCEOMHV);

c) "Proposition de schema de financement d'un programme minimum d'entretien routier", proposed by the Malian Ministry of Transport and Public Works for the period 1978-83 (hereinafter PMEM);

d) "Estimation du budget d'entretien entre 1979 et 1983," prepared by the Niger Ministry of Public Works (hereinafter BEN).

2. The network in 1977-78-79 and 1982-83

Table 7.3 gives the projected development of the Sahelian countries' road network from 1977-78-79 to 1982-83, broken down by four categories of road standards. The table should be read with caution. The figures are not necessarily comparable from one country to another, e.g. with respect to inclusion or otherwise of agricultural feeder roads, responsibility for whose maintenance rests with autonomous rural development agencies and not with the national directorates of public works. More serious is the problem of the degree of confidence that can be attached to forecasts of the road network up to 1982-83. In the cases of countries covered by the LBI forecasts, i.e., Chad, Mauritania, and Senegal, the projections are based on an expansion program suggested by a foreign consultant, which nevertheless appears to have been agreed to by the national authorities. The Niger case involves an investment proposal put forward by the interested technical ministry; as of 1979 it was not certain how much of the proposal would be incorporated in the national development plan. Finally, whatever the official character of these projections, implementation will certainly differ to a greater or lesser degree by 1982-83.

3. Maintenance objectives

The projections of recurrent expenditure requirements for road maintenance given below are based on the countries' differing objectives with regard to the proportion of each one's network to be maintained. The projections for The Gambia cover all paved and gravel roads tabulated in Table 7.3, and exclude tracks. Those relating to Niger, Senegal, and Upper Volta, and, in principle, Mali, assume adequate maintenance of paved and gravel roads and a sub-set of tracks corresponding by and large to the category "improved tracks". In the cases of Chad and Mauritania it has been assumed that the percentage of the total network maintained would increase, between 1977 and 1982, from 46 to 73% for Chad and 36-65% for Mauritania.

4. Projection results

Table 7.6 gives the projections of current and periodic maintenance of the road network of the seven countries in constant and current prices for the period 1978-79 to 1982-83.

The total expenditure requirement for current and periodic maintenance (T) is the sum of current and periodic maintenance cost, net of overhead costs and depreciation (M), plus overhead costs (OC) and depreciation of maintenance equipment (D):

$$T = M + OC + D \qquad (7.1)^{1}$$

Taxes on purchase of maintenance inputs (TI) are given as a notational item. The total T understates real expenditure requirements insofar as it does not include the cost of underutilization of equipment assigned to road maintenance.

Inasmuch as the road maintenance services will also have work to do in connection with network rehabilitation, Table 7.7 projects the total maintenance budget in current prices (MB), equal to the sum of current and periodic maintenance (T), representing recurrent costs as such, plus rehabilitation expenditure (R), the latter corresponding to replacement costs of road capital which has deteriorated due to inadequate or no

[1] Periodic maintenance expenditure is annualized in the estimation of M.

TABLE 7.6

Projections of expenditure requirements for current and periodic maintenance of the road network (T): 1977/78 - 1982/83

	Gambie (millions de Dalasis)					Haute-Volta (millions de F.CFA					Mali (millions de FM)					Mauritanie (millions d'UM)				
	M	OC	D	T	TI	M	OC	D	T	TI	M	OC	D	T	TI	M	OC	D	T	TI
	1978 prices					1979 prices					1978 prices					1978 prices				
1978	2,0	--- 1,1 ---		3,1	n.a.	n.d.	n.d.	n.d.	n.d.	n.d.	1785	97,0	24,0	1906,0	n.d.	-- 349 --		69,8	418,8	n.d.
1979	4,0	--- 2,2 ---		6,2	n.a.	n.d.	n.d.	n.d.	n.d.	n.d.	2029,3	97,8	861,3	2988,4	n.d.	-- 403,6 --		80,7	484,3	n.d.
1980	3,0	--- 1,6 ---		4,6	n.a.	880,0	n.d.	-	880,0	n.d.	2520,5	110,6	-	2631,1	n.d.	-- 109,9 --		22,0	131,9	n.d.
1981	2,7	--- 1,5 ---		4,2	n.a.	1384,5	n.d.	350	1734,5	190,6	2479,2	133,4	625,1	3237,7	n.d.	-- 133,7 --		26,7	160,4	n.d.
1982	3,0	--- 1,6 ---		4,6	n.a.	2007,0	n.d.	510	2517,0	280,6	2341,1	131,1	639,9	3112,1	n.d.	-- 142,1 --		28,4	170,5	n.d.
1983	n.d.	--- n.d. ---		n.d.	n.a.	2407,7	n.d.	580	2987,7	331,3	2254,1	127,6	652,0	3033,7	n.d.	-- n.d. --		n.d.	n.d.	n.d.
	current prices (r = 10%)					current prices (r = 12.5%)					current prices (r = 12.5%)					current prices (r = 10%)				
1978	2,0	--- 1,1 ---		3,1	n.a.	n.d.	n.d.	n.d.	n.d.	n.d.	1785,0	97,0	24,0	1906,0	n.d.	--- 349 ---		69,8	418,8	n.d.
1979	4,4	--- 2,4 ---		6,8	n.a.	n.d.	n.d.	n.d.	n.d.	n.d.	2283,0	110,0	969,0	3362,0	n.d.	--- 444 ---		88,8	532,8	n.d.
1980	3,6	--- 1,9 ---		5,5	n.a.	990	n.d.	-	990	n.d.	3190,0	140,0	-	3330,0	n.d.	--- 133 ---		26,6	159,6	n.d.
1981	3,6	--- 2,0 ---		5,6	n.a.	1752,3	n.d.	443,0	2195,3	241,4	3530,0	190,0	890,0	4610,0	n.d.	--- 178 ---		35,6	213,6	n.d.
1982	4,4	--- 2,3 ---		6,7	n.a.	2857,6	n.d.	726,2	3583,8	399,5	3750,0	210,0	1025,0	4985,0	n.d.	--- 208 ---		41,6	249,6	n.d.
1983	n.d.	--- n.d. ---		n.d.	n.a.	3657,7	n.d.	929,0	4785,7	530,7	4062,0	230,0	1175,0	5467,0	n.d.	--- n.d. ---		n.d.	n.d.	n.d.
Total	18,0	9,7		27,7	n.a.	9456,6	n.d.	2098,2	11554,8	1171,4	18600,0	977,0	4083,0	23660,0	n.d.	1312		262,4	1574,4	n.d.

Legend: M= maintenance expenditure net of overhead costs and depreciation: OC = overhead costs; D=depreciation of maintenance equipment; T=total recurrent expenditure = M + OC + D; TI = Taxes on maintenance inputs; R=annual rate of inflation. n.d. = not available n.a. = not applicable

Sources: Gambia: RPTG, Table 7.2.2 in constant prices.
Upper Volta: BCEOMHV, tables 4.4.1/2 to 4 and 4.4.1/5 (in constant prices).
Mali: PMEM, p. 6 (in current prices). We have assumed that figures are given net of taxes.
Mauritania: LBI, Table 1.6.9/2 (in current prices). We have assumed that D =20% of M + OC.
Niger: BEN. We have assumed that the figures are given net of taxes.
Senegal: LBI, tables 8.8.4/1 and 8.8.4/4 (in current prices)
Chad: LBI, table 1.9.8 (in current prices); for TI (constant prices)-- table 1.9.7. We have assumed that D=20% of M + OC.

TABLE 7.6 (cont'd)

Projections of expenditure requirements for current and periodic maintenance of the road network (T): 1977/78 - 1982/83

	Niger (millions de F CFA)					Sénégal (millions de F.CFA)					Tchad (millions de F.CFA)				
	M	OC	D	T	TI	M	OC	D	T	TI	M	OC	D	T	TI
	1979 prices					1978 prices					1979 prices				
1978	----	n.a.	----	n.d.	n.d.	3343,2	835,8	835,8	5014,8	n.d.	---	---		-	-
1979	----	3487,0	----	3487,0	n.d.	3485,8	871,5	871,5	5228,8	n.d.	---	582,0	---	116,4	698,4	9,0
1980	----	3252,0	----	3252,0	n.d.	3625,1	906,3	906,3	5437,7	n.d.	---	572,8	---	114,6	687,4	9,0
1981	----	3875,0	----	3875,0	n.d.	3795,6	948,9	948,9	5693,4	n.d.	---	556,3	---	111,3	667,6	9,0
1982	----	4519,0	----	4519,0	n.d.	3964,8	991,2	991,2	5947,2	n.d.	---	557,5	---	111,5	669,0	9,0
1983	----	5157,0	----	5157,0	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	---	n.d.	---	n.d.	n.d.	n.d.
	current prices (r = 12%)					current prices (r = 10%)					current prices (r = 16%)				
1978	----	n.d.	----	n.d.	n.d.	3343,2	835,8	835,8	5014,8	n.d.	---	-	---	n.d.	-	-
1979	---	3487,0	----	3487,0	n.d.	3834,4	958,6	958,6	5751,6	n.d.	---	582,0	---	116,4	698,4	9,0
1980	---	3642,2	----	3642,2	n.d.	4386,4	1096,6	1096,6	6579,6	n.d.	---	630,1	---	126,0	756,1	9,9
1981	---	4860,8	---	4860,8	n.d.	5052,0	1263,0	1263,0	7578,0	n.d.	---	673,1	---	134,6	807,7	10,9
1982	---	6348,9	---	6348,9	n.d.	5804,8	1451,2	1451,2	8707,2	n.d.	---	742,0	---	148,4	890,4	12,0
1983	---	8114,6	---	8114,6	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	---	n.d.	---	n.d.	n.d.	n.d.
TOTAL		26453,5		26453,5	n.d.	22420,8	5605,2	5605,2	33631,2	n.d.		2627,2		525,4	3152,6	41,8

Legend: M= maintenance expenditure net of overhead costs and depreciation: OC = overhead costs; D=depreciation of maintenance equipment; T=total recurrent expenditure = M + OC + D; TI = Taxes on maintenance inputs; R=annual rate of inflation. n.d. = not available n.a. = not applicable

Sources: Gambia RPTG, Table 7.2.2 in constant prices.
Upper Volta: BCEOMHV, tables 4.4.1/2 to 4 and 4.4.1/5 (in constant prices).
Mali: PMEM, p. 6 (in current prices). We have assumed that figures are given net of taxes.
Mauritania: LBI, Table 1.6.9/2 (in current prices). We have assumed that D =20% of M + OC.
Niger: BEN. We have assumed that the figures are given net of taxes.
Senegal: LBI, tables 8.8.4/1 and 8.8.4/4 (in current prices).
Chad: LBI, table 1.9.8 (in current prices); for TI (constant prices) -- table 1.9.7. We have assumed that D=20% of M + OC.

TABLE 7.7

Projected road maintenance budget (BE): 1978/79-1982/83
(values in current prices net of taxes)

	Gambie (10^6 Dalasis)			Haute-Volta (10^6 F.CFA)			Mali (10^6 FM)			Mauritanie (10^6 UM)			Niger (10^6 F.CFA)			Sénégal (10^6 F.CFA)			Tchad (10^6 F.CFA)		
	T	R	BE	T	R	BE	T	R	BE	T	R	BE	T	R	BE	T	R	BE	T	R	BE
1978	3,1	—	3,1	n.d.	n.d.	n.d.	1906,0	n.a.	1906,0	418,8	128,0	546,8	n.d.	n.a.	n.d.	5014,8	110,0	5124,8	—	n.a.	—
1979	6,8	—	6,8	n.d.	n.d.	n.d.	3362,0	n.a.	3362,0	532,8	140,0	672,8	3487,0	n.a.	3487,0	5751,6	133,0	5884,6	698,4	n.a.	698,4
1980	5,5	10,3	15,8	990,0	—	990,0	3330,0	n.a.	3330,0	159,6	128,0	287,6	3642,2	n.a.	3642,2	6579,6	—	6579,6	756,1	n.a.	756,1
1981	5,6	17,4	23,0	2195,3	2076,9	4272,2	4610,0	n.a.	4610,0	213,6	63,0	276,6	4860,8	n.a.	4860,8	7578,0	—	7578,0	807,7	n.a.	807,7
1982	6,7	19,7	26,4	3583,8	1722,8	5306,6	4985,0	n.a.	4985,0	249,6	68,0	317,6	6348,9	n.a.	6348,9	8707,2	—	8707,2	890,4	n.a.	890,4
1983	n.d.	n.d.	n.d.	4785,7	1592,2	6377,9	5467,0	n.a.	5467,0	n.d.	n.d.	n.d.	8114,6	n.a.	8114,6	n.d.	n.d.	n.d.	n.d.	n.a.	n.d.
TOTAL	27,7	47,4	75,1	11554,8	5391,9	16946,7	23660,0	n.a.	23660,0	1574,4	527,0	2101,4	26453,5	n.a.	26453,5	33631,2	243,0	33874,2	3152,6	n.a.	3152,6

Legends: T: Total current and periodic maintenance costs (above, Table 7.6)

R: Rehabilitation costs (See sources of Table 7.6)

BE: Total maintenance budget (T + R)

n.d.: Not available

n.a.: Not applicable

maintenance at all:

$$MB = T + R \qquad (7.2)$$

Converted into US dollars on the basis of official exchange rates as of December 29, 1978[1], recurrent costs of current and periodic maintenance, plus rehabilitation costs, amount to U.S.$583.4 million in current prices for the period 1978-79/1982-83. To this total should be added approximately $90 million worth of investment in maintenance equipment and training of specialized personnel[2], giving a total of U.S.$ 673.4 million for the total program.

In comparison, cumulative commitments of public foreign assistance from 1975 to 1978 for the transport sector as a whole, including construction, maintenance and rehabilitation, amounted to U.S.$ 64.8 million in current prices.[3]

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1 IMF Bulletin, January 29, 1979 (p. 29).

2 CBI, pp. 11-14, corrected in the case of Upper Volta with estimates from the BCEOM/V report (Table 4.4.5/1).

3 Source: CILSS-Club du Sahel, op.cit., Sahel D (79)38, October 1979, pp. 117-125.

VII. 6 Recurrent costs of non-road transport infrastructure in the Sahel

Non-road transport infrastructure in the Sahel comprises railroads; ocean, river and lake ports, along with ancillary installations; and airports. The fact that road transport predominates in the region in no way detracts from the vital roles that the other modes of transport are called upon to play, notably:

a) sea and air transport move the major share of passengers and freight to and from countries outside the Sahel[1];

b) in the countries with large territories (Mali, Mauritania, Niger), air transport competes successfully with road transport as regards passengers and non-bulky commodities;

c) the railroad permits transport of passengers and bulky commodities -- ore, cement, etc. -- over long distances, and connects interior regions with Atlantic Ocean ports;

d) finally, particular geographic situations necessitate recourse to non-road transport (e.g. sea and air transport among the different Cape Verde islands), or call for serious study of better utilization of non-road transport, considering the high cost of building and maintaining roads (for example, the Gambian authorities have recognized the existence of an imbalance in their past investment program as regards transport, leading to overextension of the road network in relation to the possibilities offered by the natural lane comprising the Gambia River).

It may also be noted that non-road transport modes will likewise be called upon to open up some extensive subregions. Construction

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[1] This situation may be changed with completion of the Trans-Saharan highway, putting the Sahelian countries in contact with Mediterranean ports.

of the Diama and Manantali dams by the Organisation de Mise en Valeur du Fleuve Sénégal(OMVS) will make the Senegal River navigable year-round from the river mouth up to Kayes (Mali)[1]. For their part, the CILSS and Club du Sahel have initiated preliminary study of the potential impact on long-term development of the Sahel, beyond the year 2000, of extending the existing Dakar-Bamako railroad up to Niamey, the capital of Niger.[2]

While road maintenance is financed primarily from domestic sources out of general budget revenues and earmarked receipts (fuel taxes, registration fees, etc.),[3] non-road transport modes require their users to pay tariffs or fees, whose collection is in principle a simple matter. The corresponding user charge should be calculated on a basis that makes it possible to operate, maintain and replace the equipment utilized, and should in principle include the cost of underutilization of any maintenance equipment subject to alternative use in the local economies.

At the same time calculation of user charges should also take account, inter alia, of the following considerations:

a) in some situations raising a tariff or fee may reduce total receipts (demand elasticity greater than one);

b) the tariff or fee enters into determination of the final price of the good transported. Specifically, it affects prices of export commodities and could thus potentially undermine the comparative advantage of these goods on the international

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[1] The OMVS, an African organization, comprises the riperian countries of the Senegal River with the exception of Guinea, i.e. Mali, Mauritania and Senegal.

[2] SEMA-METRA International: "La réalisation d'une voie ferrée transsahélienne et le développement du Sahel," study sponsored by the Club du Sahel, November 1977.

[3] This situation would of course change in the event any countries in the region chose to introduce highway toll systems, which themselves represent payment of a user charge.

market.

These considerations are both elementary and obvious, but nonetheless relevant for the situation in which the Sahelian countries find themselves.

In general, the maintenance requirements of non-road transport infrastructure in the Sahel are rarely totally covered by receipts from user charges. There are to be sure exceptions in this regard: the Dakar Port Authority, which has maintained its ship supply services at a competitive level and thus competes successfully with other West African ports, including the Mauritanian ports of Nouadhibou and Nouakchott; and the Abidjan-Niger Railway Corporation, which succeeded in keeping up with inflation-generated increases in its operating and maintenance costs by doubling its rates between 1970 and 1976, but which has decided since 1977, out of concern over becoming non-competitive with highway transport, to request government subsidies for track maintenance.

With the exception of the airports, whose operation and maintenance are controlled by international regulations, the solution to the problem of recurrent costs of non-road infrastructure in the Sahel rests to a large extent with modernization of existing equipment and improved programming of personnel requirements, a number of units now facing a serious problem of overstaffing (e.g. the Senegalese and Malian railway authorities). Even so it will not always be possible to avoid exogenous disturbances leading to increased unit costs of operation and maintenance -- e.g. inflation of fuel prices -- or sudden declines in receipts of fees -- e.g. the interruption of Mauritanian copper exports has substantially reduced the Nouakchott port's freight receipts.

Finally, it may be noted that the Gambia Port Authority (GPA) offers a particularly interesting example of a system of cross-subsidization of recurrent costs of non-road infrastructure largely outside the authority of the central government budget. Although receipts and expenditure are in balance in the GPA's overall operating budget, it has regularly transferred the surplus from certain of its operations --

Banjul seaport, ferry services on the Gambia River -- to finance money-losing operations under its wing-- the Lady Chilel Jawara riverboat, the Banjul-Barra ferry. The appropriateness of such a system can be questioned from the viewpoint of the interests of society as a whole. Specifically, should not most deficit operations be re-organized, even eliminated, in order to generate an overall surplus that could be allocated to ocean and river transport, or perhaps to extending certain operations of the same subsector, which could eventually operate on a basis of financial profitability?

Chapter Eight: HUMAN RESOURCES: EDUCATION AND HEALTH

VIII. 1 Common characteristics and issues

The expected benefits from education and health projects share two major characteristics that have a significant bearing on how one goes about analysis of recurrent costs and cost recovery in those sectors:

i. education and health care projects produce public as well as private goods;

ii. a substantial proportion of benefits are realized over a long period of years subsequent to expenditure of the resources in question.

The education and health sectors present numerious examples of public goods. Increased literacy enhances the efficiency of the socio-economic system, and thus the quality of life in general; even those excluded from a literacy program see their welfare to some extent enhanced by it. Vaccination campaigns against contagious diseases diminish the risk of infection even for persons who have not been vaccinated. The existence in a certain community of a hospital or dispensary creates a public good in the sense of providing all members of the community with access to the diagnostic and treatment facilities offered by the institution; the increment to welfare conveyed by this access is, of course, different from that conveyed by actual utilization of the facilities, in connection with which payment may be demanded for services rendered.[1]

The timing of a project's benefits distinguishes a directly productive sector from a social sector. In the case of a directly productive

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[1] It should be noted that even those sectors which are essentially producers of private goods, in the sense that consumption of such a good by one individual makes it impossible for anyone else to consume the same good, are in a position of generating a more or less significant amount of public goods; a herder who vaccinates his cattle against rinderpest reduces the risk of diseasefor his neighbor's herd, even if the latter has failed to follow suit (Chapter V); the establishment of artificial forests reduces the danger of desertification, thus benefitting farmers in the vicinity of the plantations (Chapter VI).

sector, benefits arise at the moment the good or service produced is consumed. In the case of a service (insurance, transport, etc.), production and consumption take place simultaneously. In the case of goods (millet, clothing, etc.), consumption takes place some time after production, although in the case of durable and semi-durable goods (refrigerator, automobile, etc.), consumption is stretched out over several years. By contrast, the benefits of a social sector such as education comprise the increase in productivity over an individual's working life facilitated by the knowledge and skills which the educational system imparts to him. It is true that education also generates immediate or near term consumer benefits -- to be a student or trainee can be very satisfying, even prestigious. On the other hand, it is not primarily these immediate benefits that induce any society to allocate a substantial portion of its resources to expansion and operation of the education sector.

In the case of health care, immediate and near-term benefits are doubtless more important than in the case of education -- one has only to think of relief of pain and discomfort, or reduction of work-days otherwise lost. However the long-term benefits of human health care are no less important, both for the individual and the society in which he lives. An improved state of health, promoted by facilities which provide adequate preventive and curative treatment of disease, help to ensure the individual a higher level of economic and social productivity, whose effects he enjoys during his entire lifetime and from which the community also benefits. An additional benefit of health interventions is the prolongation of life expectancy, which at the present time does not exceed 45 years in the Sahel.

These special characteristics of education and health (public goods and long-term benefits) carry implications for the strategy of optimal expenditure programming, the classification of recurrent and non-recurrent expenditure, and cost recovery.

Expenditure programming. Since by definition public goods are not traded in the marketplace, assigning a price to them becomes a

highly subjective exercise. Moreover, given that the private benefits which an individual derives from better health and a good education affect his entire professional and physical life, the projection of such benefits is subject to an even wider margin of error than characterizes benefit-cost analysis of projects in other sectors. Accordingly, the benefit-cost approach is not generally recommended for design or appraisal of education and health projects. Rather, the preferred procedure is so-called programming by objectives: alternative targets are proposed with respect to the schooling rate of different age cohorts, the number of inhabitants per doctor, etc.; certain sets of targets win the approval of political decision-makers; and the planners then seek the least expensive paths to achieving or fulfilling the approved targets. It should be noted that these targets are not set in a vacuum. Programming by objectives is an iterative process in the course of which the decision-makers become increasingly conscious of the costs associated with implementing alternative objectives, as well as various procedures for recovering these costs. The planning process likewise increases later awareness of the trade-offs which exist between implementation of social objectives versus other objectives of national policy. One condition of the desired outcome is that no shift away from it to a different solution would be capable of attracting a broad political and social concensus.

Recurrent and non-recurrent expenditure. National income accounting treats as government -- or, as the case may be, private -- consumption all expenditures on education and health care other than physical capital formation. On the other hand, a more general view of the dynamics of development suggests that a substantial proportion of expenditure on education and health, whether current or capital, should be considered as human capital formation, the main exception being those expenditures on education which serve to produce graduates who replace individuals retiring from the labor force (this process is not considered as making a net addition to the nation's stock of human capital). However, in the Sahel the education sector is growing slowly from a relatively small base, and only a small fraction of trained manpower is near retirement age.

Concretely, this means that, viewed from the human capital approach, the education sector scarcely gives rise to any recurrent expenditure at all.

Thus, if the Sahelian countries adopted such an approach vis-a-vis the donors and submitted their entire education and health budgets for international financing on the ground that it all constitutes development expenditure, they would merely be following widely accepted precepts of modern development theory. However, in the present case convention holds national budget classifications close to social accounting procedures, and so the contribution of education and health to gross national product is measured by annual staff costs plus depreciation of capital facilities.[1] Investment comprises construction of facilities and purchase of durable equipment normally included in capital or development budgets and eminently eligible for foreign aid. Staff salaries and benefits, student support costs, purchase of current materials (notebooks, drugs, etc.), and maintenance of plant and equipment are treated as the operation and maintenance expenditure necessary to generate current product in association with the invested capital. This latter expenditure is funded under recurrent budgets, and, with two exceptions, not ordinarily eligible for foreign assistance. The exceptions are: technical assistance in the form of donor nationals, who form a significant component of the teaching force in segments of some Sahelian educational systems as well as some medical personnel; and start-up assistance that certain donors provide for a limited period to new institutions, particularly programs that represent experimental departures from classical models of education and health care.

On the other hand, one cannot avoid noting that donors seem to have been less forthcoming in applying the concept of human capital in the education sector itself than in other sectors. In the case of directly productive sectors and transport infrastructure, the donors have not hesitated in financing,as development expenditure, training of personnel

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[1] C.f. the discussion of depreciation in the context of recurrent cost analysis, Chapter II, Section 2.5 above.

assigned to operation and maintenance of equipment -- e.g. tractor drivers and mechanics. In many countries, including the Sahel, primary and secondary school teachers are trained in specialized institutions, known as normal schools. Traditionally the donors have considered operation and maintenance costs of such institutions as recurrent costs, and therefore ineligible for aid financing. It would appear to be the regular, undifferentiated character of this expenditure stream that has conditioned the donors' attitude, while an approach more in line with the teachings of modern development theory would have led them to treat such expenditures as part of human capital formation required for expansion of the education sector as such.[1]

Cost recovery. The fact that education and health projects produce a significant quantity of public goods has obvious implications for recurrent cost recovery. Thus, it is difficult to make the individual pay the entire cost of the service rendered (by being vaccinated, he reduces the risks of contagion for his neighbors, hence it would be unfair to make him pay the full price of the vaccine). Another difficulty arises from the fact that the benefits are perceived in the long run. It is difficult to expect beneficiaries to pay cash for the services rendered; rather, what one can hope for is that the long-run impact of the activities will enable future generations to reimburse government expenditure out of taxes on their increased income.

The difficulty of immediate recovery of education and health expenses, combined with general inadequacy of budget resources means that, at the present time, only a fraction of the population has access to a minimum level of training and medical care. In the four most populous countries of the region, the primary school enrollement rate does not exceed 44 percent, and goes as low as 13 percent (1978 figures); although Niger is ahead of the other countries of the region with respect to furnishing primary health care, it has nevertheless not yet succeeded in

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[1] In defense of the donors' traditional approach, it is appropriate to point out that insofar as new teachers merely offset attrition due to deaths, retirement, etc., their entry into the system corresponds to capital replacement rather than net investment.

reaching more than 20 percent of its population in this respect.

The present distribution of education and health services in the Sahel is primarily a function of political and geographical considerations: location of the benefitting population in relation to government headquarters, ease of access to outlying regions, etc., always reflecting a rural-urban imbalance favouring the urban population. The implications are also clear -- inhabitants of the towns and most accessible regions, already enjoying a living standard superior to that of the rest of the population, receive gratis services at least part of whose cost they would be willing to pay, while the rest of the population has no access to training and health facilities.

In a few cases, this anamoly is partially corrected in the Sahel by the existence of explicit or de facto systems of payment for social services.[1]

Finally, it should be emphasized that a comprehensive study of possibilities for cost recovery in education and health would have to be based on an analysis of the income distribution of the populations served. The limited evidence which we have been able to collect in the course of the present study prevents us from offering rigorous, quantitative conclusions supported by such an approach to the problem of recovery of recurrent costs.

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[1] See below, Sections VIII.3, Subsection 3 (education) and VIII.5 (health).

VIII.2 Education: The present situation

1. Introduction

The Working Group gathered information on the relevant parameters of the education sector and its sub-sectors -- investment and operation and maintenance expenditure -- for the four most populous countries of the Sahel, namely Mali, Niger, Senegal and Upper Volta. In addition, three projects were the subject of case studies: rehabilitation of primary and middle schools (centres d'éducation générale or CEG) in Niger, the Upper Volta Rural Education Project, and the Mali School of Medicine, Dentistry and Pharmacy.

The Niger school rehabilitation project, financed by the Fourth European Development Fund (EDF), was designed to rehabilitate 166 primary schools and 16 CEG's which had been built in different parts of the country with assistance from the First and Second EDF's. The deterioration of these establishments was a result of inadequate maintenance over periods of 9 to 14 years. The project also covered establishment and training of a school maintenance team. The project case study brought out the following issues: appropriateness of initial construction norms to local conditions; the trade-off between increased returns to education resulting from regular building maintenance, and returns obtained by allocating the corresponding funds to other purposes; foreign aid financing of deferred maintenance; and requirements for efficient maintenance.

The rural education project in Upper Volta was designed to provide a three-year basic education to rural 14-year-olds. The education model was designed to be more relevant to the vocation of farming and less prone to arouse aspirations towards urban migration. Initiated in 1961, the project entered its third phase in 1979. Financial assistance was provided by the World Bank and the EDF. Issues raised: whether the approach is a viable alternative to classical primary education; realization of objectives in terms of reduced costs of education; shortfalls in maintenance of physical plant and equipment; participation by donors in recurrent cost

financing; and the level of the eventual burden on the Upper Volta national budget.

Founded in 1978 and graduating its first doctors in 1974, the Mali school of Medicine, Dentistry and Pharmacy accounts for over half the Malian physicians active in their own country. Issues raised: the choice, from the viewpoint of its impact on the Malian budget, of training doctors in Mali versus abroad, taking into account the availability of foreign aid for the school, on the one hand, and scholarships for training students abroad on the other hand; the impact on the rate of school plant utilization of the limited number of doctors accomodated under the Mali health budget; the need to restrict the school's training capacity in accordance with projected budget resources available for purchase of complementary inputs for exercise of the medical profession (drugs, syringes, vaccines, dressings, etc.).

2. The r-coefficient for educational expenditure

Table 8.1 lists estimated values of "r" for 9 education sub-sectors in the Sahel. The coefficient's numerator comprises teacher salaries and fringe benefits, purchase of instructional materials and supplies, and estimated optimal maintenance.[1]

The denominator of "r" represents our estimate of the replacement cost of plant and equipment in prices of the year applicable to the cost data in the numerator. The denominator makes no allowance for start-up costs or operation and maintenance expenditure during an initial period of experimentation, whose importance was emphasized, among other places, in Chapter IV on agricultural development projects. These current expenses

[1] The maintenance coefficient ranges from 0.025 to 0.05 of building and equipment costs. Based on its observations, the Working Group doubts that maintenance is actually carried out at this level in most cases, although the resulting shortfall may be partially offset by rehabilitation programs (see below).

are likely to be important in the case of training projects which represent departures from classical models of education.

Where relevant, Table 8.1 presents four variants of each r-coefficient based on expenditure (1) including and (2) excluding subsistence payments to students plus any direct boarding costs [1] as well as (3) one set of variants taking into account the presence of expatriate teachers, part of whose costs are paid by foreign aid, and (4) another set assuming that the positions in question are filled by locals all of whose costs are charged against the relevant national budget.

3. Manifestations of the recurrent cost problem in education

A sectoral recurrent cost "problem" arises when installed capacity is utilized below its optimal level as a result of an insufficient allocation of public funds for its operation and maintenance. Installed capacity in the education sector comprises school buildings, equipment and teaching staff. Thus, a priori the recurrent cost problem in education could manifest itself in several different ways.

Firstly, there might be an adequate supply of qualified teachers, but, due to lack of budget resources, some posts are left vacant. Alternatively, salaries and fringe benefits might be set at a level such as to provide teaching staff with remuneration below what they could obtain in other employment, i.e., below their opportunity cost. Here also we would find vacant posts, but in this case due to lack of qualified personnel willing to fill them. Another possibility is that some posts might be filled by unqualified staff. Other possibilities: student subventions and/or the standards of accomodation provided to student boarders might be insufficient to attract suitable candidates. Or a lack of school furnishings could diminish the effectiveness of teaching. Deterioration of plant and equipment might be such as to reduce discipline and eagerness to learn, in the extreme

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[1] The variants excluding student subventions from the numerator of "r" likewise exclude costs of building and equipping boarding installations from the denominator.

TABLE 8.1

Estimation of the recurrent cost coefficient, r, for nine education sub-sectors[1]

Sub-sectors	Student subventions excluded		Student subventions included	
	With technical assistance	Without technical assistance	With technical assistance	Without technical assistance
1. Literacy programs	0.30-2.00			
2. Primary education	0.20-0.30			
3. Secondary general education	0.10-0.12	0.10-0.14	0.11-0.14	0.11-0.16
4. Secondary technical education	0.10-0.12	0.10-0.14	0.11-0.14	0.11-0.16
5. Professional training	0.12	0.13	0.17	0.18
6. Normal schools	0.14-0.20	0.16-0.30	0.20	0.24
7. Higher education (social sciences, humanities, law)	0.11-0.16	0.13-0.25	0.13	0.15
8. Higher education (natural and applied sciences)	0.13-0.23	0.20-0.35		
9. Rural education	0.26-0.32	0.29		

[1] Interpretation: an r of, for example, 0.30 means that nonrecurrent expenditure of one million francs engenders an annual recurrent expenditure flow of 300,000 francs.

case causing instruction to be interrupted. A high rate of deterioration might itself be the result of a shortage of investment funds for plant and equipment leading to congestion of existing facilities.

The question now arises: in what situation does the Sahel find itself in this regard? We observe first that salaries and fringe benefits represent the major part of recurrent expenditure in Sahelian education -- more than 90% of total recurrent expenditure in the case of village schools. It is, thus, no exaggeration to say that availability of funds to pay teacher salaries is, by all indications, the dominant constraint on expansion of the educational system in the Sahel. This is all the more so as system expansion does not appear to have been seriously impeded by a shortage of investment funds, the donor community having traditionally provided the Sahelian governments with capital on easy terms for purposes of school construction. In some cases, local communities have built their own schools on a voluntary basis, forcing at least one of the Sahelian governments to regulate this"uncontrolled" construction. Once a school was completed, the ministry of education was faced with a fait accompli and, rather than offend local sensibilities, was obliged to supply teachers over and above budgeted amounts.

Given that expansion of Sahelian education has been controlled mainly by government's capacity to compensate its teachers, there is little evidence of vacant posts or teachers in search of jobs due to lack of classrooms. At most, tight budget conditions have led to temporary interruptions in payment of salaries, although in these circumstances all civil servants have suffered, not only the teachers.

The question as to whether the level of salaries paid has succeeded in attracting teachers of suitable quality is a different and relatively more complex problem. In general, salaries and other benefits offered to public sector employees have, according to our observations, increased at least as rapidly as the general price level during the last six or eight years (which of course does not signify any increase in real living standards). Meanwhile, the overall growth of economic activity has been too slow to create

a substantial number of alternative jobs which might have attracted teachers to directly productive activities in the private sector (industry, manufacturing, service industries, etc)[1]. In other words, and taking into account the presence of foreign technical assistance personnel, the availability of teaching staff appears to have been a secondary constraint on the expansion and satisfactory operation of Sahelian education, compared with the limiting factor of insufficient current budget resources.

The importance and character of student subventions vary among different types of training institutions according to whether or not the students are provided with free accomodation, and whether or not they enjoy a temporary status as public officials, which generally carries the right to a "prés'.aire" in addition to traditional benefits. For some institutions whose students are already on a salaried basis, the data indicate that student salaries and financial aid can amount to double the costs of instruction. The ratio decreases in the case of institutions of technical and professional education where instruction costs are relatively higher on account of the expensiveness of teaching materials and the lesser number of students per instructor.

It is the view of the Working Group's consultants that, in several sub-sectors of Sahelian education, student subventions exceed the level that would be required to attract suitable candidates. To the extent that this aid is given to all students in a particular sub-sector without regard to family income, the system can in some cases even be described as lacking in equity. A reallocation of budget resources designed to assist students on the basis of merit, taking into account the parents' capacity to bear a greater or lesser share of the cost of their children's subsistence, would certainly increase the efficiency of the student aid system. In making this observation, the Working Group's consultants are fully conscious of the political difficulties that government might encounter in modifying the present system, with its vested rights and privileges.

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1 See below, Part Three.

With respect to general government services, empirical evidence suggests it is current material inputs, more than any other expenditure item, that are most likely to bear the brunt of a fiscal crunch.[1] The Sahelian education sector is not spared a similar phenomenon. Not only are school supplies generally insufficient, but frequently what there is is made available to the pupils only well after the start of the school year. In a number of cases, parents who are able to do so find themselves obliged to advance the money to meet their children's needs.

With respect to maintenance of plant and equpiment, it appears that almost everywhere in the Sahel this is below the levels which engineers and builders regard as adequate. On the other hand, school administrators are unwilling to hazard estimates as to the negative impact of inadequate maintenance on educational performance.

Actually, in the years immediately following a school's construction, the impact of poor maintenance on the school's capacity to carry out its mission appears to be limited, even imperceptible. It is only after a few years that the effects of substandard maintenance cumulate, leading to serious operating problems.

It should also be noted that not all items of school plant maintenance deserve equal priority. Cracks in walls and walkways, exposure of foundations, peeling of paint and minor damages inflicted on doors and windows probably do not jeopardize, at least up to a certain threshold of deterioration, the pursuit of learning. But it is quite the opposite with lack of water, blockage of sanitary installations, collapse of walls around the school compound, breakage of tables and chairs, and especially disintegration of the ceilings, permitting sand and dust to invade the classrooms during sandstorms and tornadoes, often forcing classes to be suspended.

In the case of the Niger school rehabilitation project described

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[1] See below, Chapter 11, Table 11.8 and accompanying discussion.

above, the lack of maintenance of more than 150 primary schools and 16 middle schools for periods ranging from 9 to 14 years disturbed the authorities sufficiently -- some classrooms were beginning to be abandoned -- to request rehabilitation aid from the foreign aid agency that had financed the initial construction. The parameters of this project underline the complexity of the school maintenance problem facing the Sahelian governments. Rehabilitation cost of a Niger primary school was estimated at approximately F.CFA 150,000 in 1975 prices, roughly equivalent to 15% of the school's replacement cost (including teacher's house), likewise estimated in 1975 prices. In other words, calculated over a period of 10 years, the rehabilitation cost corresponds to an annual flow of maintenance expenditure equal to 1.5% of capital replacement costs.

Faced with the alternatives of maintaining a school (at an annual rate of 1.5% of original construction cost) or deferring maintenance until rehabilitation becomes necessary, government will not remain indifferent. Considering that one franc available for expenditure today has a present value greater than its value after 10 years, disregarding inflation, and insofar as deferral of maintenance tasks does not significantly reduce school performance, one can easily imagine a government opting for the second alternative, allowing it to use for expansion of the school system several years' worth of money initially allocated to maintenance. Using the rate of 1.5 percent, we have calculated that the Niger government was able, by deferring maintenance on the schools covered by the project, to open 25 additional schools and thus increase school enrollment by 15 percent of the pupils accomodated by the initial project. On the other hand, using the rate of 3 percent preferred by the engineers, doubtless influenced by European maintenance norms, deferral of the maintenance would have made it possible to open 50 additional schools and increase enrollment by 30 percent. Knowing the pressure the Sahelian governments face to increase educational opportunity for a population whose expectations have grown considerably since independence, one can only be sympathetic to the choice that was actually made. In addition, the political savvy underlying this choice must also be acknowledged -- rehabilitation is regarded as an investment cost and therefore generally eligible for international finance, while maintenance as such definitely is not.

It is not suggested here that Niger consciously allowed its EDF-financed schools to deteriorate in order to be able to open new ones (the Niger authorities dispute such an implication). Rather, we merely wish to show that such a choice does exist and, in a situation where literacy and training requirements are immense, the appropriate answer is not obvious.

VIII.3 Future prospects of the education sector

1. Projections to 1984-85

At the time the Working Group was collecting its data on the education sector, of the different Sahelian countries only Mali, Senegal and Upper Volta had projections available with respect to educational investment. The Group's consultant summed the corresponding recurrent costs. Where projected cost figures were lacking, the values of the r-coefficient given in Table 8.1 were applied to estimates of capital plant to project cost figures up to 1984-85. Table 8.2 compares the projections of recurrent cost growth rates with actual rates in the past. Such projections are inevitably subject to a considerable margin of error. Not all the investments will necessarily be implemented, and the planned investments do not necessarily include all projects that will generate recurrent costs. More serious is our ignorance of any improvements in operation and maintenance of school facilities which the Sahelian governments may undertake, as well as of any real salary increases they may grant to the teachers, both these being measures carrying potential for higher values of "r" than those estimated in Table 8.1.

TABLE 8.2

Annual growth rates of education sector recurrent costs, (projected and actual)

(Growth rates calculated on the basis of constant price data)

Country	Projections 1978/79 - 1984/85	Actuals 1972/74 - 1978/79
Mali	2.5 or 3.1 %[1]	7.2 %
Senegal	3.5%	3.8%
Upper Volta	3.1%	5.0%

[1] The 3.1% figure assumes that planned investments will be implemented within five years rather than six.

In spite of these uncertainties, the Table 8.2 results suggest that the three countries' educational investment plans will not lead, by 1984-85, to recurrent cost growth rates above those observed in the past, and will thus not impose an intolerable burden on the national operating budgets of these countries.

This finding is unavoidably global in nature, and for the same reason glosses over problems that may arise in certain subsectors of education -- those classical education establishments characterized by high unit costs, and new projects designed to accelerate literacy and skill formation in rural areas by diverging from classical models.

Classical education establishments with high unit costs are those offering highly specialized training with limited domestic demand (faculties of law, schools of medicine); in such institutions, instruction costs cannot be reduced via economies of scale. The need to have small student-teacher ratios, and to purchase, normally abroad, large amounts of teaching material (manuals, laboratory items, etc), as well as the amount of equipment required per student, join forces to keep operation and maintenance expenditure at a high level. Salary costs can be reduced by the presence of a significant amount of technical assistance personnel financed from abroad, but at the same time, this tends to increase the vulnerability of these institutions to outside decision-making as well as their dependence on foreign recruitment procedures. Establishment of these facilities is typically preceded by debate as to whether or not it would be preferable for the time being to continue sending trainees abroad, taking advantage of foreign scholarship aid, rather than to commit oneself to local training for the cadres in question.

The objective of rural training programs is to reduce instruction costs and provide training such that the pupils, having acquired useful skills for rural activity, are less qualified to advance through higher stages of the classical system than the products of lower levels in that system. Typical problems afflicting such programs are: cost overruns such that annual operation and maintenance expenditures turn out to be as high as, if not higher than the classical alternative, and desertion by pupils or graduates of the system whose aspirations remain focused on

opportunities, real or imaginary, that exist outside of smallholder agriculture.

In both cases -- highly specialized institutions and rural training -- the most serious problem is doubtless the lack of credibility which these programs enjoy in the eyes of the planning and budget authorities of the central government. With regard to highly specialized institutions, how can one justify, in the eyes of public opinion, an annual training investment in a single individual that can reach F.CFA 800,000 in a country whose per capital income does not exceed F.CFA 37,500? Another problem characteristic of this category is that the vagaries of foreign technical assistance and recruitment sometimes leave major gaps in staffing on short notice, sending the institution's administrators to the national treasury, begging for supplemental allocations which are generally not approved.

We do not presume to pass judgment here on educational technologies in use in the Sahel, an issue that formed no part of our terms of reference. Nevertheless, the Working Group's investigations brought home to it that the sub-sectors mentioned above are likely to suffer from insufficient recurrent cost financing precisely because the Sahelian authorities themselves have not reached a final judgment with regard to the contribution which continuation and/or expansion of these subsectors may make to the welfare of the population.

2. Towards an expanded concept of the recurrent cost "problem" in Sahelian education

Table 8.3 gives enrollment rates of the primary-school-age population in four Sahelian countries for the years 1972-73 and 1977-78. The slow increase of these rates, departing from an already low base, between the two years illustrates the constraints imposed on the Sahelian countries' development by inadequate school enrollement, one of the major vehicles of development doubtless being increased primary education of the population. Considering these modest enrollment rates,

it appears the governments in question are, on the whole, already allocating to education what may be considered as a maximum share of their budget resources. In 1977-78, all levels of education accounted for the following percentages of the national recurrent budget of four countries cited above: Mali -- 31.6%; Niger -- 27.5%; Senegal -- 26.5%; and Upper Volta -- 25.8%.[1] In this connection, it is certain that any foreign aid for expansion and operation of the primary education sector in the Sahel would have a significant impact on the countries' development, while contributing a partial solution to the "expanded problem" of recurrent costs.

TABLE 8.3

Primary school enrollment rates (1972-73 and 1977-78)
(percentage of the population aged 7-12 years)

	1972-73	1977-78
Mali	19	24
Niger	13	20
Senegal	37	44
Upper Volta	9	13

Source: Calculated by the Working Group's education sector consultant on the basis of data given in the following sources, adjusted by most recent enrollment data supplied by the respective Ministries of Education:

1. Mali: working documents of the National Education Seminar, Dec. 1978
2. Niger: UNESCO: Analyse et développement de l'éducation, 1978
3. Senegal: UNESCO: Développement de l'Education: Analyse et perspectives, 1977.
4. Upper Volta: Data supplied by the Ministry of Planning.

[1] Estimates of the consultant.

Apart from the possibility of channelling more foreign aid into the education sector, it is also worth inquiring into the potential that exists for reducing, pari passu with an increase in enrollment, the principal component of recurrent costs in education, namely teacher salaries and benefits. The Working Group's education consultant brought out that in most of the Sahelian countries teacher salaries equal nine to twenty times per capita income, while in industrialized countries the same ratio is on the order of two to three. (It should be stressed that this comparison in no way puts Sahelian teachers in the lap of luxury, given the low average living standard in the Sahel.) With a view to obtaining teacher services at a lower cost, one could consider increasing secondary education of the type given in teacher training institutions to a level exceeding requirements of the public sector as such.

This surplus supply would make it possible to hold the evolution of teacher salaries more in line with that of the average income of the population, while at the same time ensuring a skilled manpower "reserve" to a directly productive private sector whose expansion seems to us to be a condition sine qua non of Sahelian development in general.[1]

3. Recurrent cost recovery

At the present time the Sahelian governments appear to have recourse to three ways of obtaining contributions to educational finance from local jurisdictions and/or students' families:

i. private education is allowed to develop relatively freely, in some cases with government subsidies involving a lower cost, per pupil, than public education, given that the teachers' salaries are paid primarily by the families. Private schools account for between five and ten percent of primary school enrollement; the percentage in secondary education is higher still.

ii. Responsibility for financing certain expenditures, for example the construction and maintenance of canteens, is officially assigned to local jurisdictions, or, in the case of Mali, parents' associations.

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[1] This point is developed further in Part Three of the report.

In 1977-78 these associations contributed, on average, 4000 Malian francs per pupil, representing about six percent of expenditure under the national education budget.

iii. in some cases local jurisdictions and/or parents' associations are presented with a fait accompli in the sense that the government simply fails to cover certain expenses to whose financing it is legally committed.

It is doubtful that the sum total of the various approaches to cost recovery accounts for more than five percent of expenditure on Sahelian education.

With respect to primary education, the wealthiest communities, particularly those in and around the capital cities, could certainly support a larger contribution. This might be done through levying a school tax based on real estate values.

As concerns the secondary and higher levels, the free education provided there reinforces social inequality, given that access to those levels is closely correlated with a family's social class and economic means. There is much to be said for the principle that, until a country is in a position to provide universal free primary education, a significant proportion of expenditure on secondary and higher levels should be recovered via school fees, exemptions (stipends) to be granted on the basis of merit and according to criteria of family means.

VIII.4 The health sector: costs of primary health care

1. Introduction

The recurrent cost financing problem in the health sector was approached via case studies of five primary health care projects, comprising four local operations in Senegal and a nation-wide program in Niger. The Niger program and three of the Senegalese projects serve rural areas; the remaining Senegalese project is sited in Dakar. Donor support for the four Senegal projects is provided by Belgium, Canada, the Netherlands, and the United States respectively. The Niger activity is financed primarily by that country, with contributions also forthcoming from the United States, Germany, the Netherlands, Canada, Oxfam, and Africare. Additional information on the health sector was obtained by analysis of the Sahelian countries' health budgets and through the previously mentioned case study on the Bamako School of Medicine, Dentistry, and Pharmacy. Unfortunately, time and resources available did not permit an examination of the CILSS' other major priority in the health sector, namely, the Expanded Program of Immunization.

2. The concept of primary health care.

Primary health care comprises a set of simple diagnostic and treatment services that are dispensed to the population by individuals with little training--usually no more than a few weeks--operating out of rudimentary posts that are designed to be replicable at low cost in rural communities or urban neighborhoods throughout a country. Primary health care practitioners may dispense both preventive medicine via advice on nutrition, child care, and sanitation, as well as curative facilities with respect to a few common ailments subject to simple treatment. Where primary care facilities are available, the majority of persons seeking medical attention have their first contact with the health system through these practitioners, who refer patients to higher levels of the system (dispensaries, clinics, and hospitals) and better trained practitioners such as nurses and, eventually, physicians for ailments which the primary level is not equipped or qualified to treat.

Primary health care generates both private benefits and public goods. Private benefits are particularly associated with the palliative nature of primary health care, much of whose thrust is toward relieving physical pain and mental anguish rather than saving lives or curing debilitating diseases, i.e., ailments that affect the patient's productivity. Activities in primary health care delivering important public goods, on the other hand, are vaccination and cure of diarrhea in children, to whom the disease is often fatal. Public satisfaction over relief of an individual's pain and the option of access to health care in time of need are other public goods that were mentioned in the introduction to this chapter.

3. Recurrent and nonrecurrent costs of primary health care

Nonrecurrent costs of primary health care compromise all current and investment expenditures associated with establishing a unit of productive capacity--equipment, training of village health workers (VHW's), and an initial inspection. Referring to the case studies underlying the Working Group's investigation, a significant proportion of the units in Niger's 20-year-old primary care program may be regarded as established, while all the rural projects in Senegal are clearly in an experimental phase. In line with Chapter IV's treatment of agriculture, operating and maintenance expenditures carried out as part of an effort to establish a viable project are regarded here as nonrecurrent or development expenditure.

Training costs are a function primarily of trainee qualifications and locus of training. Qualifications refer to age, education, and village status of trainees. Younger and more educated trainees are less likely to stay in the village, requiring that additional VHW's be trained to replace them. Trainees who are respected members of the village hierarchy are better able to inspire villagers to trust and take advantage of the services offered by the village health team. Locus of training: decentralizing training programs in the villages enables members of the village hierarchy to participate and become VHW's, making for lower VHW turnover and attendant costs.

Recurrent costs of primary health care can conveniently be classified as follows:

i. VHW compensation and drug costs outside the national budget;
ii. Overhead cost of maintaining availability of care;
iii. Supervision costs.

i. VHW compensation and drug costs outside the national budget.

In Chapter II, the issue was raised as to whether costs borne by the community outside the national budget should be included in recurrent expenditure. It was suggested that expenditures in the social sectors should be examined gross of community contributions in order to focus attention on both the total magnitude of expenditure and alternative means and degrees of recovery.

The question of appropriate vehicles and levels of VHW compensation is a major subject of debate in primary health care planning in the Sahel. In Niger it is still an open question as to whether a system based on volunteer workers is viable in the long run; government is concerned over the rate at which VHWs migrate or otherwise cease to function necessitating renewed nonrecurrent expenditure on replacements. It has been suggested that paying the VHWs a small but regular government stipend would save money over time by reducing the drop-out rate.

Where the principle of VHW compensation is established, it may be carried out by any of the following vehicles:

a) government salary accounts for 100 per cent of compensation;
b) compensation is drawn wholly from the community, via (1) lump-sum annual subscription fees, (2) consultation fees, and/or (3) commissions on drug sales; or
c) combination of (a) and (b).

The amount of compensation, and the economic costs of service rendered, may be identical as between a series of programs following these different vehicles, yet obviously the burden on the national budget varies greatly.

Any comparative discussion of financial aspects of primary health care projects should specify clearly the role of the national budget, but for many purposes it will also be useful to compare gross costs regardless of the sources of finance.

In the case of drug distribution, the question arises as to whether drugs should be handled similarly to fertilizer and other agricultural inputs, which Chapter IV treated as salable commodities whose distribution is a quasi-commercial function, counting only the deficit as public sector recurrent expenditure. The principle of full cost recovery on drugs is not universal in government-run health facilities in the Sahel; in principle, patients in government hospitals do not pay for their drugs. Once again, considering the social character of the health sector and the experimental nature of most primary health care interventions, it is useful to know the annual operating cost of such a program gross of drug purchases; the net burden on the government budget and the community contribution to cost recovery should always be clearly identified.

ii. Overhead cost of maintaining availability of care

For later analysis of cost recovery issues, it is useful to classify post-establishment recurrent expenditure in health projects as between those expenditures that contribute to maintaining the availability of health care and those that represent the marginal cost of treating an additional patient. In rural primary care, the first category comprises, in theory, the village health worker's "reservation" wage, that is, the least amount of regular compensation that the individual must be paid in order to stay on the job and be available to patients; also included in overhead cost are costs of supervision and, insofar as it compensates for staff turnover, training.

The second category comprises the cost of drugs and supplemental compensation to which village health workers are entitled for treating a patient. Where an outside salary constitutes most or all of a VHW's compensation, the difference between that salary and the "reservation wage" may be attributed to the marginal cost of treatment.

It is likewise of interest in cost recovery analysis to distinguish between costs of outpatient care whose marginal cost the majority can afford even at low income levels, and serious disorders requiring referral and removal, for which only a minute fraction of patients could pay marginal cost.

iii. Supervision costs

This is a vital component of government recurrent expenditure in primary health care. In Niger the nurse attached to a rural dispensary, who has responsibility for up to 15-20 village health teams (VHTs), is in theory supposed to visit them all once a month. Less frequent visits are called for from the administrator of the Circonscription Médicale at arrondissement level, and finally the departmental health chief. In practice supervision is somewhat erratic, the frequency of visits being closely correlated with ease of access. Niger health ministry data reveal yet another correlation, between regularity of supervision and continued functioning of VHTs. (The significance of this relationship must be qualified insofar as isolation imposes additional obstacles to successful VHT operation.) Fiscal stringency tends to bear more heavily on availability of transport equipment and fuel for supervision visits than on any other facet of primary health care.

Table 8.4 presents the health sector consultant's estimates of nonrecurrent and recurrent expenditures borne by the Niger national budget in connection with the establishment and operation of a single VHT in the Department of Niamey. The following categories of expenditure are identified: i) Nonrecurrent-- promotion, training, equipment, and supervision during roughly the first four months of operation; ii) recurrent--regular supervision following establishment, and recycling of team members every three years. The Niger primary care system operates on the principle that VHWs should be volunteers, and that if socio-economic conditions in a particular village call for any compensation in cash or kind for their services, this is a matter to be arranged by the villagers themselves; thus government recurrent costs include no compensation of VHWs.

TABLE 8.4

Estimate of costs incurred by Niger's national budget per village health team (VHT) in the Department of Niamey

	Staff salaries	Transport and vehicle maintenance	Travel per diems	Miscellaneous	Totals
1. Non-recurrent costs (per VHT of 4 members as part of 10 VHT's in a single cohort).					
1.[a] promotion	8.778(b)	12.600(c)	1.740	300	23.418
2. training	16.380	11.400(d)	216	39.200	67.196
3. equipment	-	-	-	58.000	58.000
4. supervision for about 4 months	6.200	3.986	1.158	33	11.377
TOTALS (non-recurrent costs):	31.358	27.986	3.114	97.833	159/991 CFA
2. Recurrent costs (per VHT per year)					
1. supervision (per VHT as part of group of 70 VHTs per arrondissement)	18.599	11.957(e)	3.474	100	34.130
2. recycling (per VHT as part of group of 10 VHT's every three years)	5.460	3.800	72	13.067	22.399
TOTALS (recurrent costs) :	24.059	15.757	3.546	13.167	56.529 CFA

ASSUMPTIONS

a. two visits per village
b. 6 man-days X 2 visits per village = 12 mandays
c. at a rate of 250 km per promotion trip to 1-3 villages
d. rate of 250 km per trip to transport trainees during course
e. based on 11,000 km of travel per year per arrondissement.

$$\text{r-coefficient} = \frac{56,529}{159,991} = 0.35$$

A second principle of the system is that distribution of pharmaceuticals and other supplies[1] in primary care should be self-financing. It does indeed appear that participants in the system--both the VHWs who issue drugs to patients and can replenish their stocks, whether at government drug supply depots or private pharmacies, only on payment of cash, and the patients themselves--appreciate and observe the principle, although a detailed cost accounting might well show that part of government's deficit on account of the operation of the regional dispensary system should be attributed to the primary care program--if so, this element of the burden on the national budget is excluded from Table .4. Also excluded is any portion of the cost of the health ministry's central administration that comprehensive cost accounting might likewise allocate to the program.

Looking only at government expenditure, the data in Table 8.4 define an r-coefficient of 0.35 for the primary health care program in the Department of Niamey, Niger. The health sector consultant expects recurrent expenditure to grow faster than nonrecurrent as the program extends into less accessible areas, raising the coefficient for the last VHTs established in the year 2000 to 0.61. The coefficient's denominator makes no allowance for O & M expenditure during the period required to establish a viable program. If such data were available, one would want to define establishment of productive capacity in terms of functioning VHTs in an entire inspection or group of, say, 20 villages, since apparent success in only a few scattered villages would not justify continued government involvement.

The primary care projects studied in Senegal had been operating for too short a time to make possible meaningful r-coefficient estimates.

4. Projection of future recurrent costs of primary health care.

A common procedure for projecting recurrent costs in new projects is to calculate the average cost of an operating unit such as a VHT in a pilot project and assume that this figure will hold when the project is expanded.

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[1] "Other supplies" refers mainly to gauze bandages. In this section "drugs" will be used as a shorthand reference to all medical supplies distributed by VHWs.

However, average costs are in fact likely to rise because pilot projects tend to be built in less remote places where the conditions are favorable and the population is receptive. Hence the procedure tends to understate recurrent costs. A variant of this approach utilizes an estimate of unit cost for a measure of service rendered--e.g., one contact between a VHW and a patient--and projects this into areas of program expansion. It turns out that a given unit of input renders fewer units of service in less accessible areas, so that costs are once again understated.

Making hypothetical assumptions about parameters such as the number of VHTs in an arrondissement (assumed 50 per cent lower than the data underlying Table 8.4), the number of VHTs served by one training promotion (also dropping by half), the number of man-days required to animate a village (rising from 12 to 20), the length of an average journey, and fuel consumption per 100 km. as the terrain becomes rougher, the health sector consultant puts the government recurrent cost per new VHT in the year 2000 almost four times higher than the 1978 figure (F.CFA 266,000 vs. 57,000, using constant prices).

VIII.5 Financial cost recovery in primary health care

1. Criteria for optimal recovery

As pointed out in the introduction to this chapter, no Sahelian country can afford at this stage to provide free primary health care to more than a small fraction of its citizens. At present the countries spend between 5 and 10 per cent of their national recurrent budgets on health. The Working Group's health sector consultant estimates that, taking into account rising marginal cost as Niger's primary health care program moves into more remote areas, its extension to the 70 per cent of the population not yet served will involve establishment costs slightly in excess of the entire 1979 health sector budget of F.CFA 2.7 billion. Once the corresponding 8,000 additional village health teams are established, their annual operation, including O & M expenses of associated regional dispensaries but excluding all drug purchase and distribution costs, will absorb resources equivalent to another 75 per cent of the same budget figure (1979). Given other demands on state resources, such

expenditures can only be managed over a considerable period of time. Hence the speed at which additional villages can be brought into the health care network is closely related to the rate of cost recovery in both existing facilities and future extensions.

The case studies reviewed on behalf of the Working Group provide many indicators of the willingness and ability of low-income families to pay the marginal cost of effective out-patient care, including drugs. In its palliative aspect primary health care competes with traditional healers, who have always been remunerated by patients and their families.

Until all low-income families have access to primary care, a country that refrains from pursuing all reasonable avenues of cost recovery is in effect denying part of its population a vital service to whose cost they are willing to contribute significantly, while providing the service to better-placed individuals at less than the latter would be willing to pay.

Referring to our earlier categorization of recurrent expenditure on primary health care into marginal and overhead costs, following are suggested criteria for optimal cost recovery:

I. Marginal cost of out-patient care, including drugs and VHW fees or, where VHW compensation is based on a regular salary, the value of VHW time devoted to a case. All patients should pay this in full excepting those excused on grounds of indigence, certified by the community or on a basis of democratically approved criteria.

II. Base compensation of VHWs (part of the overhead cost of maintaining availability of primary health care). Some contribution to this expense should be demanded of local communities from resources under their control.

2. Actual cost recovery performance in primary health care

The case studies reviewed by the Working Group illustrate various cost recovery mechanisms:

I. VHWs are nominally uncompensated volunteers, replenish their drug supplies with cash proceeds of previous sales to patients--as already mentioned, this is the system in Niger. As of December 1978, health ministry data showed VHTs to be functioning in 1,496 of the country's 9,000-odd villages. Wherever a team had been in operation longer than required to exhaust its initial drug supply, it could be said almost by definition to be demonstrating successful cost recovery, since the secouriste member of the team (or one of two such agents) would have had to pay cash down for a new supply. It could likewise be said that, wherever a team had ceased to function, failure of cost recovery was somehow involved--either the VHWs attached an opportunity value to their time that was not being compensated by their neighbors, or proceeds from drug sales were inadequate to enable the secouristes to replenish their stocks, and service could not continue for want of an essential material input.

II. Flat fee (F. CFA 50 or 100) per consultation, regardless of type of treatment, drugs dispensed, or VHW time consumed. Applies in two Senegal projects, Pikine (Dakar) and Siné Saloum. Some posts seem to be meeting drug and salary expenses, others not. Taking all posts in toto, neither project is recovering all its drug supply costs. In one project the average post is covering personnel costs; the second project's record is not yet clear.

III. Subscription system--all families are charged a regular subscription fee to support overhead costs; in addition a consultation fee is charged per visit. Applies in one project (Fatick), only small proportion of families have paid the subscription fee.

IV. Consultation fee based on replacement cost of drug dispensed--One project (Gossas). Not clear whether fee equals or exceeds drug cost. As yet, no evidence on collection rate.

In all the projects there appears to be a community consensus behind free care for indigent persons, but some still lack operational criteria for defining need.

3. Factors behind cost recovery shortfalls in primary health care

The failure of user charges to cover costs in primary health care schemes may be attributed to any of four sets of factors:

I. Problems of health care "technolcgy"

Due to errors in design and implementation, project cannot deliver full range of intended services. Villagers aware of this, reluctant to pay. Errors include choice of inappropriate persons as VHWs, inadequate training, lack of effective supervision from dispensary/Circonscription Médicale/ Department level, excessive distance from drug supply depots. Of the projects visited by the health sector consultant in Senegal, Pikine appeared to be most successful in resolving technological problems and supplying a package of services of whose value consumers were convinced (probably explained to some extent by the project's urban setting).

II. Inadequate financial controls

Patients' fees or drug sale proceeds commingled with private funds. Particularly prone to happen where individual responsible for collecting and handling funds is on the government payroll. Such a situation has frequently led to shortage of funds to replenish drug supply. Charges of corruption have been aired. This situation does not apply in Niger, where the VHWs have no recourse to government subsidies to replenish drugs if they have not collected enough from issue of previous supplies.

Assignment of the treasurer's function to a village volunteer untrained in bookkeeping has also not worked out. A promising alternative for handling drug sales is to give the village storekeeper responsibility for procuring supplies and selling them to the secouriste, retaining a portion of the markup and making the rest available to meet program costs in accordance with decisions of a community oversight committee.

III. Absence of operational criteria governing entitlement to free care

Unless the provision of free care and supplies is restricted to a small proportion of villagers who are truly indigent, financial discipline

Chapter Nine: CONCLUSIONS OF THE PROJECT AND SECTORAL ANALYSIS

IX.1 Shortfalls in operation and maintenance and their causes

The Working Group's sectoral review has illuminated many instances where the Sahelian countries are not satisfying the operating and maintenance requirements of projects under their juridiction. This has manifested itself in signs of deterioration of the corresponding physical and institutional capital and/or, apparently, diminished socio-economic returns on the investments in question. The phenomenon of under-utilization and/or under-maintenance of installed capacity, as defined in Chapter II, seems to be particularly characteristic of the agriculture[1], rural water supply, livestock, highway infrastructure and public health sectors.

In accordance with the topic of the present study, the question arises as to how far the shortfall in capacity utilization and maintenance should be regarded as in some way "due" to shortage of finance to cover recurrent costs. It is rare that a shortfall in utilization and maintenance, as compared with some previously designed or currently desired level, is accompanied by underspending of an explicit budget allocation for that purpose. Therefore one may incline initially to attribute the problem to lack of finance.

However, government revenues are fungible, meaning that a government can allocate its domestic resources to whatever expenditure objects it chooses, within an overall ceiling. The overall ceiling may be--and in the case of the Sahel it almost invariably is--too low to enable the government to operate and maintain every unit of the public sector's installed capacity at its design level, but a single project cannot be said to suffer *a priori* from insufficient financing of its operation and maintenance costs. Rather, an apparent lack of such financing must mean that the government has decided to allocate the

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[1] It should be noted that many of the illustrations brought out in Chapter IV concerning the agricultural sector related to unmet costs that do not fulfill the Working Group's definition of "recurrent", since the projects in question have not yet reached a stage of normal operation.

breaks down. All VHWs are subject to pressure by their relatives, young VHWs can be pressured by anyone older than them. Older VHWs who are established community members may be able to resist pressure for free care, but otherwise it is necessary to establish strict criteria, preferably by decision of the community oversight committee, and assign to a village elde the function of issuing chits of entitlement to free care. The issue is less significant in Niger where the secouristes are aware that abuse of free care undermines their capacity to replenish supplies.

IV. Excessive dependence on foreign expertise, management, and finance

Cases are known where intervention of foreign donors with direct financial and staff support has forestalled pressure on community members to pay for the service or forego it, and/or prevented the integration of the primary care program in one or a group of villages with the national health ministry's administrative network, which is the only viable source of supervision in the long run. Donor assistance should be used strategically to underwrite overhead costs and facilitate program expansion, but not to supplant local initiative and support, or undercut the national health bureaucracy's administrative role.

It should be noted that our discussion of cost recovery possibilities in the health sector is limited to primary health care. The cost recovery problem takes on another dimension in regard to secondary and tertiary care--on the one hand the majority of the population cannot even pay the marginal cost of such care, while on the other hand there is a privileged minority that is capable of supporting the full cost, particularly with the help of a self-financing insurance system (which, for administrative reasons, cannot be extended to a major share of the population).

i. Technical shortcomings and errors in design and execution. The preceding chapters have illustrated the existence of projects, sometimes on a large scale, based on the introduction of technologies which were unproven or not yet perfected. Agricultural development projects have suffered particularly from this state of affairs -- introduction of insufficiently tested techniques of cultivation, distribution of low-yielding new seeds, etc. In other cases, a superficial knowledge of the conditions in the project milieu has led beginning with the critical establishement phase, to a poor choice of extension personnel, thus preventing the projects from "taking off" on account of lack of productive contact between this personnel and the population in question. Not only agricultural operations have suffered from this phenomenon (too young and inexperienced extension agents: indeed, agents who are never to be found on the job), it has also afflicted health projects (village health workers lacking sufficient authority in their village). Many of these projects are already faits accomplis: managers have been trained, local administrative structures have been created, and the donors have committed themselves to disbursing large sums over a certain number of years. There are even cases in which projects are maintained by nothing more than inertia, even though donors and recipients agree tacitly on their lack of viability. This applies to some agricultural projects, and also certain education projects based on models diverging sharply from classical education (rural training). On the whole, the situation is related to the fact that project designers have generally underestimated the establishment period required by such activities, apart from often failing to distinguish between the phases of experimentation and establishment proper.

Two possible cases can be envisaged here:

A. a project for which no proven technology exists (the right seed has not yet been found or developed);

B. a proven technology is available, but the conditions of its introduction in the physical and social milieu are not yet fully understood.

corresponding amount of uncommitted receipts to different objectives, socio-economic or otherwise, which it considers as having higher priority.[1]

The key question arising from project and sectoral comparisons of capacity utilization and maintenance is, therefore, why some projects and sectors have seemed more prone than others to suffer from shortfalls in this regard. The conclusion emerging from the preceding five chapters is that above-average shortfalls in capacity utiliation and maintenance result from one or more of four categories of factors:

i. Technical shortcomings and errors in design and/or execution of the production side of projects and programs, as a result of which the latter are seen not--or at any rate not yet--to be fulfilling their objectives. In directly productive activities this situation usually mainfests itself via operating deficits that are higher than anticipated, whether due to higher costs or lower revenues than specified in project design.

ii. Public policies that impede the establishment of cost recovery vehicles by which users would pay at a minimum the marginal cost of the private benefits they receive from government facilities.

iii. A skewed distribution of public investment such that capacity is more heavily concentrated in some activities and sectors, and underrepresented in others, in comparison to the distribution of services preferred by current policy-makers; and

iv. An absolute constraint on the supply of one or more factors critical to operating and maintaining the capacity in question.

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[1] The principle of fungibility of government revenues is taken up again more rigorously and in greater detail in Chapter X, Section X.1.

Finally, the more directly productive activities--crops, fishing, etc. -- are joined together with social activities -- education, health, etc. -- in one and the same project, and the weaker the central government's capacity to establish an efficient system of communication and distribution permitting it to respond rapidly to field requirements (supply of inputs when required, regular site inspections, etc.), the more time the experimental and establishment phases require. Establishing an efficient system of communication and distribution is itself often experimental in nature.

When a recipient government and its donor(s) fail to recognize the experimental character of an intervention, implementing it on a large scale as though the technical and socio-economic parameters were already fully established, more often than not a large, unforeseen operating deficit results which the local budget could carry only at heavy cost to the government's other commitments. Hence the danger of under-utilization and under-maintenance to which donors frequently feel obliged to respond with additional infusions of capital.

ii. Failure to provide adequate cost recovery mechanisms.

The Working Group's sectoral review suggests that, in most cases where a project generates private benefits part of which are potentially subject to recapture in order to offset public sector costs, severe financial pressures are encountered, jeopardizing optimal operation and maintenance, if the government substitutes budget allocations of uncommitted revenue for the cost recovery potential. It is almost as if one agency of government, namely the budget authority, were penalizing the responsible operating agency, whether consciously or not, for its failure to exploit the cost recovery potential.

In the case of directly productive projects -- agriculture, livestock, fisheries, forestry -- the capacity for cost recovery is simultaneously a function of the price offered to the producer and the possibilities that exist for taxing different stages in the production and distribution chain.

It is Case B that must be our primary concern here. With respect to Case A, it is a matter of limiting the scale of the operation to an exercise in basic research, affecting as little of the population as possible until such time as proven scientific results have been obtained.

In Case B, by contrast to Case A, the improved seed has been successfully tested in an agricultural research station, but there is little or no understanding of the requirements for multiplying and distributing it. Or, to take another example, suppose there is a desire to exploit encounters between farmers and extension agents to encourage the use of pesticides. Similarly, it is hoped to take advantage of the interest shown by the population to attract them to literacy and primary health care programs, thus instituting a true enterprise in integrated rural development. Such situations involve a lengthy experimental phase, as distinct from and subsequent to the basic research phase, during which the intervention should preferably affect only a sample, representative but small, of the population. Never is sufficient attention paid to the psychological, political, and social cost of project failure affecting a sizable population. It is only after completion of a successful experimental phase that one can talk about establishment proper.

Evidence provided by the sectoral review concerning the duration of the experimental and establishment phases of projects in different sectors is not very clear. This is inevitable because of the lack of historical perspective in the Sahel necessary for successful government interventions in the different sectors. In the case of agricultural projects designed to improve techniques of cultivation, experimentation and establishment seem to require a total of about 15 years. Crop protection projects seem to have needed about 12 years. The fishing boat motorization project in Senegal took four years to reach normal operation, but the environment was favorable, the Senegalese fishermen having had some experience with outboard engines before the start of the project under review and having thus verified the profitability of the proposed technology. The Mauritanian fishery authorities consider, on the other hand, that establishing a similar project in their country would take from six to eight years.

distribution chain extending from the point of production. Increased international financial assistance (possibly non-governmental) for activities in this area is justifiable from the viewpoint of satisfying basic needs of the most disadvantaged populations in the Sahel.[1]

In contrast to projects in directly productive sectors we have social sector projects--education and health--where the fact that benefits appear in the long run makes difficult a priori the institution of a system of immediate recovery. Moreover, the importance of public goods[2] makes imposition of full cost payment relatively inequitable; in this connection, payment by the government of part of the price of a vaccine or cost of a literacy program can be justified. On the other hand, it is also inequitable to

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[1] It should be recalled that no activity in this subsector is included in our sample.

[2] A public good was defined in Chapter II as a good or service such that (a) the enjoyment of its benefits by one or more members of society in no way impedes similar enjoyment by any other member(s) and (b) no member of society can be excluded from enjoyment of such benefits regardless of whether or not he has shared in the burden of producing the good or service.

A producer price that is set too low, as is generally the case with food crops, livestock and to some extent, forest products, not only diminishes direct recovery capacity -- i.e., potential tax revenue derived from sales proceeds and earnings -- but likewise limits the government's ability to transfer to the private sector certain activities connected with marketing and distribution of inputs and/or outputs. These activities, generally carried out by state-owned enterprises, have traditionally burdened the Sahelian governments with the cost of financing their operating deficits; in any case an excessively low producer price prevents private entrepreneurs from taking over these operations, inasmuch as profit margins would not suffice to cover the marketing and distribution costs which they would have to bear.[1]

With regard to export crops, marketing and movement of the harvest up to the port are organized in a relatively centralized manner, which increases the government's ability to tax the different stages in the production and distribution chain.[2]

Near-subsistence production constitutes a particular subsector of food crop agriculture where the smallholder's output is devoted primarily to satisfying his food requirements and those of his family. The capacity to recover recurrent costs of public sector interventions in this area is almost nonexistent: very little of the harvest is sold and there is next to no

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1 The fact that there exist in the Sahel more or less significant private marketing channels for food crops and livestock products reinforces this point rather than contradicting it. In this case the products are sold in a free market, the prevailing price exceeding that in the controlled market.

2 The reader will have found, in Table 4.4 of Chapter IV, an estimate of recovery coefficients for several of the agricultural projects studied. This coefficient rarely exceeds 0.6(cash crops) and can in certain cases be less than 0.3(food crops). At the same time it must be pointed out that most of these projects have not yet reached their stage of normal operation. The concepts of recurrent costs and their recovery are ambiguous under these circumstances.

charges depends on a project's ability to offer regular, quality service at low cost, as well as on the absence of interventions from donors who, by covering operating costs in the short run, threaten to discourage, for at least a whole generation, the willingness of the populations to pay for services which they consider essential. Collection costs associated with user charge recovery may themselves be reduced by organizing the collection on a decentralized basis (for example, village communities with respect to the water tax).

What has been said for the social sectors is valid likewise for integrated rural development projects which include education and training segments, as well as for the animal health subsector, where public goods may be important (vaccination against epidemic diseases of cattle), thus warranting government takeover of part of recurrent costs. When payment of a user charge or tax is demanded from a producer--purchase of vaccine by a herdsman, water tax levied on an irrigator--it must be remembered that the beneficiary will only be willing to pay, even in favorable economic conditions, for what he actually receives. To try to finance indirect administrative costs by payment of user charges is unrealistic in the Sahel, at least in present circumstances.

Recovery of recurrent costs associated with maintenance of the most important transport infrastructure in the Sahel, namely the road network, is a different question. In most of the countries recovery of these costs could easily reach 100% via earmarking of all taxes on fuel together with other duties and taxes paid by vehicle owners. The fact that this is not happening is the result of a difficult general government budget situation such that these sources of revenue

provide such services entirely free of charge. Given the budgetary situation of the Sahelian countries, such a policy condemns irrevocably the majority of the Sahelian populations, and especially those in isolated regions, to wait many decades in order to receive elementary education and primary health care. The same remark applies to the rural water supply sector where in the case of the program studied (Senegal) no user tax is currently imposed, on either low- or higher-income beneficiaries.

Different forms of cost recovery may be suggested, of which some are already more or less in effect: payment of marginal cost (primary health care), full cost (hospitalization and medical evacuation of upper income individuals). or a charge in excess of full cost (consumption of water via direct connections).[1] Exceptions to the payment of such user charges may always be made for the least fortunate members of society on condition that the status of indigents should be defined in such a way as not to encourage free-loaders, and should be the subject of decisions taken as democratically as possible (village councils, school parents' associations, etc.). Finally, cost recovery capability via imposition of user

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[1]The capacity to pay full cost for certain medical treatments may be increased if part of the population is covered by a system of medical insurance which would in turn stimulate demand for health care different from primary care. However, it is not conceivable at the present time, from an administrative viewpoint, to include the entire Sahelian population in such a system--even industrialized countries have found it impracticable to extend the health insurance system to the lowest-income members of society.

of the cost of any anticipated under-utilization.[1]

[1]Putting at 15 per cent the real return on a piece of maintenance equipment costing, for example, 10 million francs CFA, if the equipment is immobilized four months during the year, it would be a matter of adding to its gross annual rental value the sum of 500,000 francs CFA (= 10 million x 0.15 [return] x one-third [four months out of the year]) corresponding to the cost of under-utilization.

are highly appreciated, particularly considering their relative ease of collection. Moreover, as already emphasized, the government is sovereign with respect to allocation of its revenues, and it may well consider it more beneficial for society to have more teachers than well-maintained roads.[1]

We recall that there are no road tolls in the Sahel, although Upper Volta is currently discussing the principle and means of implementation. Traditionally, road toll systems have been considered impracticable in developing countries (high administrative costs, possibilities of evasion, etc.). We ourselves believe that, in the Sahel, consideration should be given to possibilities for certain governments to exact levies at border points on heavy transports passing through their territory (here the cases of the Gambia and Upper Volta, which receive a large part of such traffic, come to mind).

Finally, the study of the transport infrastructure sector has shown that when maintenance is carried out on force account, the agencies concerned rarely include, in the gross rental value of maintenance equipment, an estimate of the cost of possible under-utilization. The same situation may prevail in other sectors characterized by substantial physical infrastructure which has to be maintained by mechanical means (dams, boreholes, etc.). In our view, failure to take account of the cost of under-utilization has two consequences: under-estimating actual recurrent costs, on the one hand, and biasing the allocation of maintenance work in favor of government agencies rather than private firms, which as a matter of sheer survival have to include in their overhead costs an estimate

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[1] See following subsection 3.

donors in this regard. At the present time, construction programs generally include major components of maintenance and/or rehabilitation. The need has been recognized to create adequate human and institutional capital--training of maintenance crews, improvement of management and operation of public works directorates, etc. To this should be added the establishment of Road Funds which guarantee to some extent that part of the funds obtained, both domestic and foreign, will be channeled into maintenance.

iv. Absolute constraints on factor supplies. A factor that is critical to optimal maintenance of public sector capacity but also in severely limited supply is the institutional structure required to initiate and manage a regular physical maintenance function. The constraints imposed on maintenance activity by absence of such a structure are particularly evident in sectors characterized by large physical installations, e.g. roads and irrigation schemes. It is clear that such deficiencies cannot be met by massive infusions of foreign capital in the short run, but only by building up human and institutional capacity, a process which the donors can accelerate with technical assistance.

Instances have been reported in most sectors where the execution of operation and maintenance functions requires specialized skills that are either not available at all in a country or are irrevocably committed to a sub-set of the activities that require them. Where pay scales and arrangements for importing skilled labor are subject to rigidities, often politically imposed, a constraint arises that may impede capacity utilization and maintenance over significant periods of time.[1]

Finally, one might be tempted to view foreign exchange as a factor distinct from revenue but likewise in constrained supply, which fact limits importation of material complements such as fuel, lubricants, and spares. However, recalling our earlier reference to fungibility, no individual project demands so large a share in a country's access to foreign exchange that its demands could not be met, albeit at some expense to other claimants, should the policy-makers' preferences so dictate.

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[1] Recognition of the government's need to continue hiring manpower with scarce qualifications does not mean that one must approve indiscriminate hiring of all products of certain educational levels.

iii. Skewed distribution of public investment. This heading refers to situations where the current distribution of public sector productive capacity, among sectors and, within sectors, among categories of facility, does not reflect the preferences of current policy-makers, who therefore divert resources away from the operation and, especially, maintenance of the capacity they consider to be in excess, in favor of establishment of new capacity or more intensive operation of existing capacity in areas to which they assign higher priority. The skewed distribution of capacity may have originated in colonial times, reflecting the preferences of outside rulers, it may reflect evolution of local policy-makers' preferences pari passu with changes in the political scene, or it may come about through the influence wielded by outside sources of funds in restricting the uses of their aid.

Policy-makers' preferences in regard to the composition of public sector capacity need not be conscious or explicit in order to be effective. No national authority will admit to regarding its national highway network as "over-developed" in relation to the country's needs, yet by tending to under-maintain their roads and thus allow deterioration of this component of the public sector capital stock, some Sahelian governments have in the past revealed an implicit preference to expand other categories of public services in comparison with the highway stock, even at the expense of an absolute reduction in the latter.

It should be noted that implicit preferences are subject to change through both political evolution and enhanced knowledge of the consequences of alternative courses of action or inaction. The Working Group noticed a marked evolution of the Sahelian governments' attitude toward expenditure on road maintenance, supported to be sure by the preferences of certain key

We will leave to one side, for the moment, cases where cost recovery capability is the principal factor underlying adequate operation and maintenance.

Our first example of a success story is that of fishing boat motorization in Senegal. This is explained in part by the commercial nature of the project and the high receptivity of the Senegalese fishermen, but one must also credit the project with introducing original procedures that have prevented recurrent costs from ballooning. For example, engine repairmen are not wage-paid employees of the project: they retain the fees for their labor net of a 15 percent payment to cover recurrent costs of electricity and workshop maintenance. This spares the project from having to pay their wages during slack periods which intervene immediately after delivery of engines. The repairmen seem to be satisfied with this situation, all the more so since they are allowed to use the same workshops for repair of equipment not related directly to the project.

A second example is that of the forest plantation in the Bamako region. Apart from the receptivity of the population and the existence of a Malian Forestry Fund which returns part of the proceeds of the stump tax to the project, another cause of success is the great care that was taken in establishing the plantation, leading to maintenance requirements below those initially foreseen.

A third success, in relative terms, is road maintenance. If the choice of this example may surprise those who have traveled on Sahelian roads, where traffic interruptions due to breaking up of road surfaces are frequent, together with accidents and breakdown of vehicles, it remains true that a

number of favorable conditions have converged. As indicated above, donors and recipient countries have understood that it is not sufficient merely to build roads -- one must also maintain them.

Finally, the Sahel offers a case which is at once both a success and a failure, according to one's viewpoint: this concerns the operation and maintenance of certain school installations. A number of Sahelian countries have conditioned school expansion on the rate of growth of instructional personnel, itself determined by the size of the national education budget. It is thus not surprising to find schools functioning in relatively satisfactory conditions. On the other hand, if one takes into account the modest character of enrollment targets, achieved and projected, the situation is far from satisfactory and the problem of satisfying needs of a recurrent nature takes on a new dimension, largely peculiar to the social sectors. We return to this issue in Chapter XII.

IX.3 The recurrent cost coefficient "r": empirical evidence

For a particular project, the recurrent cost coefficient, "r," has been defined by P.S. Heller as the ratio between recurrent costs in a year of normal operation and the sum of non-recurrent costs, also referred to as establishment or development costs.[1]

We will not repeat here the discussion in the sectoral chapters concerning the problems posed at once by the definition of "r" and its estimation in the different sectors. Rather we will confine ourselves to pointing out that:

i. for certain sectors, in lieu of estimating r as defined above, we give annual recurrent expenditure per unit of physical capacity (per borehole installed, animal fattened, kilometer of road built, etc.). In such cases it was felt that either estimating the value of the denominator of the ratio was subject to too much uncertainty (problems of pricing, etc.), or that for purposes of projection it was preferable to preserve the information in the form of unit cost coefficients, considering that a sectoral program, even if formulated in a global manner, is normally based on data concerning numbers of physical units (number of boreholes), kilometers of road to be maintained, number of animals to be fattened, etc.

ii. For certain sectors, the r-coefficient was estimated or reestimated by project function. This applies particularly to agricultural development projects, which often carry out an impressive number

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[1] Above, Chapter II, Section II.7.

> of functions, ranging from maintenance of irrigation works to marketing of the harvest, covering along the way production, research, and extension, not to mention a host of others.[1]

Table 9.1 following allows the reader to locate within the sectoral chapters the tables providing estimates of "r" or the ratio of recurrent costs per unit of physical capacity. For convenience of presentation, it was not considered useful to reproduce all this information by bringing the tables together in a single format.

IX.4 An inventory of possible sectoral measures

Table 9.2 presents an inventory of possible measures mentioned in the sectoral chapters, IV-VIII, for consideration as part of a sectoral approach to resolving the recurrent cost problem. It should be pointed out that some of these measures are already in course in certain countries of the region. A subset of the measures is incorporated in the main recommendations to the Sahelian governments and international finance agencies proposed by the Working Group in Chapter XV.

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[1] See above, Chapter IV, Section IV.1, Table IV.1.

TABLE 9.1

References to recurrent cost coefficients (r) of development projects in the Sahel

Sectors	Number of table in the report	Definition of r (or its substitute)	Geographical Coverage	Comments
I. Agriculture	4.2	in value terms	Chad, Mali, Niger, Senegal, Upper Volta	of little significance (comparing projects)
	4.3	in value terms	Niger, Senegal, Upper Volta	significant by function for community development, cooperative formation, animal health, and maintenance of infrastructure
II. Rural Water Supply	4.5	per borehole installed	Senegal	
III. Livestock	5.5	per head of livestock	Mali, Mauritania, Senegal, Upper Volta	animal health, smallholder ranches, extensive pastoral operations
IV. Fisheries				limited applicability in the two projects studied
V. Forests	6.1	in value terms	Mali, Upper Volta	
VI. Road Transport Infrastructure	7.2	per kilometer of road built	Chad, The Gambia, Mali, Mauritania, Niger, Senegal, Upper Volta	encompasses current and periodic maintenance for four different standards of road development.
VII. Education	8.1	in value terms	Mali, Niger, Senegal, Upper Volta	calculated for nine levels of training with four variants (with and without student support; with and without technical assistance)
IX. Health	8.1	in value terms	Niger	applies to recurrent and development (training) costs borne by the national budget for village health teams in the Department of Niamey

[1]Page numbers of the tables are given in the index of tables at the beginning of the report.

TABLE 9.2

Inventory of possible sectoral measures

Sectors			Page
I. Agriculture	1.	Allow for project establishment periods of sufficient length (15 years for an integrated rural development project).	65
	2.	Increase foreign aid for projects aiming at production for subsistence, i.e. where cost recovery is non-existent.	80
	3.	Distinguish between a project's (experimental) approach phase and its establishment phase as such, and limit the proportion of the rural population affected during the approach phase.	81-82
	4.	Increase the role of private traders in transmitting agricultural inputs and improved techniques.	82-83
	5.	Increase the incentive character of agricultural producer prices.	75-76
II. Rural Water Supply	6.	As a general rule, recovery of the marginal cost of water from users.	89
	7.	Recovery of the full cost of water supplied to users served by direct connections.	88
	8.	Approval of requests for new boreholes to be conditional on recovery of at least half the recurrent cost from the communities requesting service.	90
	9.	Decentralization of borehole maintenance among communities.	90
III. Livestock	10.	Recovery from herders of the marginal cost of animal health services.	113
	11.	Regional harmonization of fees and procedures for cost recovery with respect to animal health services.	112
	12.	Making greater use of locally trained vaccinators and assistants.	112
	13.	Offering a larger number of animal health services on each field visit.	112
	14.	Continuing the search for cost-reducing technological innovations such as heat-resistant vaccines.	112
	15.	Increasing the role of private traders in the distribution of animal health products.	112
	16.	Allowing for sufficiently long establishment periods for range management projects and distinguishing between the approach phase and the establishment phase as such.	113
	17.	Recovering from herders the marginal cost of water supplied to them.	113

TABLE 9.2 (cont'd)

Sectors		Possible Measures	Page
III.	Livestock (cont'd)	18. Enhancing the commercial character of other livestock projects (on-farm fattening, feedlots and ranches, breeding stations, slaughterhouses, etc.) in conjunction with establishing a system of producer prices that offer sufficient incentives.	114
		19. Coordinating agricultural and livestock extension activities for on-farm fattening projects.	108
IV.	Fisheries	20. Maintaining the commercial character of fishery activity.	119
		21. Promoting fishery cooperatives.	119
V.	Forests	22. Giving particular attention to technical aspects of land preparation for forest plantations in order to reduce subsequent recurrent costs.	126
		23. Increasing the incentive character of the official wood price.	127
VI.	Transport Infrastructure		
	Road Infrastructure	24. As far as economically profitable, and subject to the particular physical and demographic conditions of the different Sahelian countries and their subregions, seek more labor-intensive maintenance techniques.	145-148
		25. Taking into consideration the cost of underutilization of government-owned road maintenance equipment and costing the services of such equipment at its gross rental value.	136-137
		26. Improved programming of the road maintenance services' requirements for different levels of manpower.	142-145
		27. Improved flows of information concerning a) the capacity of maintenance equipment suppliers to provide after-sales service, b) the rate of road deterioration, and c) maintenance costs.	151-152
		28. Taking explicit account of the effects of alternative transport rate schedules on the level of road utilization and vehicle loads, the latter affecting maintenance costs.	150
		29. Harmonization of national policies on vehicle loads and study of possible imposition of tolls by transit countries on international carriers.	150

TABLE 9.2 (cont'd)

Sectors		Possible Measures	Page
VI.	Transport(cont'd) Road Infrastructure	30. Examination of possibilities for reducing certain personnel categories in some national railway administrat ons.	164
		31. Evaluating from the viewpoint of the national interest cross-subsidization schemes operated by some public transport companies with multiple functions.	165
VII.	Education	32. Greater utilization of the concept of human capital to justify international aid financing for teacher training programs.	170-171
		33. Discouraging introduction by the donors of maintenance-intensive school construction norms poorly adapted to the Sahelian environment.	293-294
		34. Examining the cost of student subventions in relation to instructional costs.	178
		35. Determining priorities for maintenance of school buildings on the basis of the impact of different types of structural deterioration on instructional activities.	179
		36. Reevaluating the net benefit to the community of highly specialized educational programs in relation to alternatives involving lower operation and maintenance costs.	182-183
		37. Increased participation of parents' associations in both cost recovery at community level and allocation of operation and maintenance funds.	186
		38. Examining possibilities for direct recovery from beneficiaries of part of secondary and higher education costs in accordance with family income.	186
		39. Giving consideration to financing part of primary education costs on the basis of real estate taxation.	186
VIII.	Health	40. Recovery from patients or their families of the marginal cost of primary health care.	195
		41. Establishment of detailed, operational criteria for exemption of patients from payment for primary health care.	197-198
		42. Discouraging heavy donor intervention in operation of health projects where such intervention jeopardizes eventual cost recovery from patients or their families.	198 198
		43. Recovery from patients with adequate means of the full cost of health care in conjunction with possible implementation of a limited medical insurance scheme.	198
		44. Allowing village shopkeepers to sell drugs under village health worker supervision.	197
		45. Recruiting village health workers among respected members of the village hierarchy and providing them with decentralized training at the village level.	188

PART THREE

FINDINGS OF THE STUDY OF GOVERNMENT BUDGETS AND THEIR MEDIUM-TERM PROJECTION

Chapter Ten: THE MACROECONOMIC DIMENSION OF GOVERNMENT BUDGETS

X.1 The concept of fungibility of government receipts

> In principle, the government is free to allocate its receipts, whether from taxes, grants or loans, to whatever object of expenditure it chooses.

This is what is meant by fungibility of government receipts.

The government's freedom in this regard exposes immediately the weakness of any analysis of recurrent costs that limits itself to estimating financial deficits and surpluses of individual projects and sectors, and ignores both the government's overall fiscal balance as well as the choices and limits of national policy.

Resources being limited the government allocates them, in principle, out of a concern to maximize national social welfare, up to the point where the return to the last franc CFA (dalasi, escudo, ouguiya or Malian franc) is equalized in each expenditure category, socio-economic or other. Thus a government may consider that the resources available have been expended in an optimal manner even if operation and maintenance costs have not received adequate financing. For example, one Sahelian country, which was confronted with problems of national security during the 1970's, apparently considered it optimal to allocate to national defense programs certain receipts which it had earlier planned to spend on socio-economic objectives.

Disagreements may exist at different levels of the civil service as well as among different groups in society, concerning the nature of the components entering into the definition of social welfare, as well as on the relative contribution of each category of government expenditure to the realization of this welfare. Thus, politicians, technocrats, and managers of public and private enterprises may have divergent views on the priority to be accorded to operation and maintenance expenditures relative to expenditures on public investment and general administration; concerning the portion of operating costs which should be financed from abroad; or about the desirability of preserving public investments whose operation and

maintenance costs have become very onerous.

Disagreements in the same vein may likewise arise between aid-receiving countries and donors. Clearly the weaker the government budget, the higher the contribution to social welfare of the last franc expended. Thus, for example, the government may, in an inflationary period, decide to cut a billion francs from the road maintenance budget and reallocate the savings to payment of teachers' salaries. For its part, the donor has committed itself, vis-a-vis its own budgetary and audit authorities, to guarantee that the roads whose construction it has financed will be maintained adequately by the recipient country. Even if it is willing to provide supplementary finance on account of recurrent costs, it will undoubtedly insist that such finance go towards maintaining roads and not to paying teachers' salaries, whatever the recipient government may think of this.

The second general implication of the concept of fungibility of government revenues is that the release of sufficient finance to cover development project expenditures is based in large part on a set of decisions concerning priority allocations of the nation's budget receipts. Analysis of projects and sectors in isolation cannot throw any particular light on the context in which such decisions are taken. Finally, it should be noted that the existence of earmarked receipts does not limit, except in one case, the applicability of the concept of fungibility of government revenues, Earmarked receipts consist of foreign contributions to development projects as well as taxes assigned to the financing of specific activities, e.g. the fuel tax, whose receipts are frequently allocated to road construction and maintenance. These resources are in general credited to budgets distinct from the central government's -- special operations accounts, road funds, etc. Insofar as the end uses of these resources are of such priority to national policy-makers that funds would have been allocated to them even had the currently earmarked receipts not been available to the Treasury, the provision of the money merely serves to release, for unrestricted allocation, the corresponding resources in the central pool. Fungibility is not, however, present to the extent that coverage of expenses out of the earmarked resources exceeds what would have been allocated to such uses out of the central fiscal pool. Such is the case where, for example, thanks to a generously endowed road fund, roads are built and maintained to standards which are difficult to justify in view of relatively

low existing and projected traffic levels, while schools are simultaneously being closed on account of lack of maintenance notwithstanding the population's high illiteracy rate. Finally, the fact that receipts earmarked by law end up being spent on other objects further reinforces the concept of fungibility.

X.2 The government's ex post fiscal balance and ex ante deficit: a theoretical introduction.

For any country, total government expenditure in a given year, current and capital, is equal by definition to total receipts from revenues, grants, and borrowings, plus net changes in official foreign assets and government deposits with local financial institutions. This purely accounting identity, also called ex post balance, can be written in the form of the following identity of expenditures and receipts, where each parameter is expressed in its actual (realized) value for the current year.

$$\boxed{G^* \equiv R^*} \qquad (10.1)$$

where: * refers to actual values;

and:

G*: government current and capital expenditure

R*: revenues, grants, and borrowings, plus net changes in official foreign assets and government deposits with local financial institutions;

≡: identity sign

While the ex post balance holds by definition, nothing guarantees an ex ante balance, defined as the equality of expenditure commitments and planned receipts (G and R respectively):

$$G = R \qquad (10.2)$$

(ex ante balance)

where: the absence of * denotes commitments or planned values.[1]

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[1] The concept of "expenditure commitments" should be understood here in its broadest sense (expenditures to which government has in some way committed itself vis-a-vis the public or a third party, rather than in the strict budget sense of an expenditure obligation.)

All governments face greater claims on public services than can be financed by the budget resources which their taxpayers, donors or creditors can be expected to make available to them. Unless a government imposes absolute budget discipline on itself, it will normally acquire heavier expenditure commitments than the receipts on which it can reasonably plan:

$$G > R \quad \text{(ex ante imbalance)} \tag{10.3}$$

where: $>$ signifies "is greater than" and the ex ante government deficit (symbolized by D) is defined as the difference between expenditure commitments and planned receipts:

$$D \equiv G - R \quad \text{(ex ante fiscal deficit)} \tag{10.4}$$

Expenditure commitments are themselves equal to the sum:

$$G \equiv G_1 + G_2 + G_3 + P + I \quad \text{(sum of expenditure commitments)} \tag{10.5}$$

where:

G_1: expenditures on operation and maintenance of development projects;

G_2: current expenditures and transfers for socio-economic purposes, excluding G_1-type expenditures. Includes general operation of socio-economic services, consumer subsidies, operating subsidies to enterprises ;

G_3: current expenditures and transfers for other than socio-economic objectives (central administration, national defense, foreign affairs, etc.)

P: interest and amortization payments on internal and external public debt,

I: capital expenditures (equipment purchases, construction of government buildings, public works, capital subventions to enterprises and government purchase of shares in companies)

Planned receipts equal:

$$R \equiv T + F + E + B \qquad (10.6)$$

(sum of planned receipts)

where:

T: taxes and other current receipts (fees, rents etc.)

F: public grants and loans from the rest of the world;

E: net increase in government internal debt;

B: net drawdown of that part (if any) of official foreign assets and government deposits with local financial institutions which the government considers surplus to its liquidity needs.

Wherever the ex ante fiscal deficit as defined in 10.4 is positive, different forces may join to bring about the ex post balance given in 10.1.

On the expenditure side, some commitments may go unmet, leading to an expenditure shortfall, S^* (since this is an ex post concept, it is expressed as an actual value). Thus:

$$S^* \equiv G - G^* \qquad (10.7)$$

(expenditure shortfall)

Since expenditure commitments exceed actual expenditures, S^* is positive (in this vein it may be considered as an ex post saving).

On the receipts side, the government may be able to increase its receipts beyond the planned level by obtaining emergency grants, borrowing short-term on the domestic or foreign markets, etc. These "unplanned" receipts we denote by C^*; thus:

$$C^* \equiv R^* - R \qquad (10.8)$$

(unplanned receipts)

Thus, the ex ante deficit is closed by these two balancing items, expenditure shortfall and unplanned receipts:

$$G - R \equiv D \equiv S^* + C^* \qquad (10.9)$$

(closing the ex ante fiscal deficit)

Finally we are ready to link the ex ante relationship (10.4) between expenditure commitments (G) and planned revenue (R), to the ex post balance (10.1) of expenditures and actual receipts (G* and R*):

$$D \equiv G - R \equiv (G^* + R^*) - (S^* - C^*) \qquad (10.10)$$

(transformation of ex ante deficit into ex post balance.

As relationship 10.10 shows, the ex ante deficit G-R is transformed into an ex post balance ($G^* \equiv R^*$) by the addition of S* (expenditure shortfall) and C*(unplanned receipts).

X.3 Ex ante fiscal deficit and ex post balance in the Sahel

Ex ante fiscal deficits are clearly a widespread phenomenon in the Sahel. Government accounts show that , in 1977/78 or 1978, five of the seven countries subjected to analysis in the macro phase of the study had to resort at least to net short-term borrowing (C*) to reach the ex post balance described in the preceding section. The ratio of such borrowing to government revenues was as follows: Cape Verde -- 0.48; The Gambia -- 0.60; Mali -- 0.14; Mauritania -- 2.19; and Senegal -- 0.03.[1] The accounts do not, of course, show the volume of expenditure commitments that could not be met or had to be deferred in the process, but the situations described in Part Two of the report suggest that it was substantial.

Short-term assistance from abroad was forthcoming in the form of supplementary drawings from the International Monetary Fund

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1 Source: see below, Chapter XI, Table 11.1. The ratio is defined, in terms of our symbols, by the relationship C*/T.

(Table 10.1); STABEX assistance provided by the European Economic Communities to offset sharp declines of receipts from exports of certain primary products); food assistance, at least part of which the recipient governments resell on the domestic market; and certain general budget subsidies or balance of payments support. Table 10.2 shows that non-project aid, comprising budget and balance of payments support as well as food aid and other emergency assistance, from 1975 to 1977 exceeded 20% of total public development assistance provided to the Sahel as a whole, maintaining a level of 18% of total aid in 1978.

Apart from foreign emergency assistance and/or short-term borrowing, the Sahelian countries have resorted at one time or another to the following vehicles of domestic short-term financeng: arrears in paying bills to the government's suppliers; transfers from government accounts for purposes other than those for which the funds are restricted, often by law; and increased borrowing from the central bank and other financial institutions such as commercial banks and the postal checking system.

Turning to the expenditure side of the fiscal balance, we recall that the presumption underlying the mandate given for this study by the CILSS and the Club du Sahel is that:

> the brunt of fiscal stringency in the Sahel has already started to fall, and threatens to fall even more severely in the future, on the operation and maintenance of development projects.

In the terminology of the preceding section, there is a danger that ex post fiscal balance will be reached principally through expenditure shortfalls (S^*) affecting substantially the realization of expenditure commitments undertaken in order to ensure adequate operation and maintenance of development projects (G_1).

TABLE 10.1

Sahelian country drawings from the International Monetary Fund: 1973-1979
(in millions of SDRs)

	Cumulative drawings through 1973	Annual drawings					
		1974	1975	1976	1977	19	1979
Amounts	32.0	14.8	28.5	22.3	9.9	28.0	14.8

Source: IMF, International Financial Statistics

SDR = Special Drawing Rights

TABLE 10.2

Non-project aid in the form of balance of payments support, food aid and other emergency assistance, 1975-1978 (as a percentage of total public development assistance to the Sahel)

Years	1975	1976	1977	1978
% of Public Development Assistance	25.2	20.4	21.6	18.0

Source: CILSS - Club du Sahel, " Public Development Assistance to CILSS Member Countries," Sahel D (79) 38, volume I, October 1979, p. 76.

The sectoral and project analysis has shown us that this was definitely the case for some projects and sectors. In other cases, donors have found themselves obliged to substitute for the recipient governments in financing normal or recurrent operating expenditures. However, the CILSS/Club du Sahel presumption remains valid in such cases, considering that there is no a priori reason for supposing that such finance will be continued. Finally, for a third category of cases, recurrent costs have been more or less adequately financed in relation to existing productive capacity, but the corresponding commitments have been determined on the basis of rather -- perhaps excessively -- modest social objectives.

On the macroeconomic side, our procedure was the following:

i. The ex ante fiscal deficit of each Sahelian government was projected over the medium term on the general assumption that current national policies and international aid practices would be maintained (Chapter XI, Sections IX-1 and XI-2); and

ii. Attention was focused on the constraints to which the principal items on the expenditure and receipts sides are subject, and which give the ex ante fiscal deficit of the Sahelian governments a character that might be termed, in the context of present policies, as structural (Chapter XI, Sections XI-3 and XI-4).

The results of this analysis have enabled us to add, to the inventory of measures and instruments of domestic policy and international cooperation designed to improve project and sectoral activity, a set of measures and instruments directed toward increasing the overall fiscal capacity of the Sahelian governments (Part Four).

Chapter Eleven: PROJECTION OF THE EX ANTE GOVERNMENT DEFICITS: METHODOLOGY AND RESULTS

XI.1 Assumptions and methodology

Projection of the ex ante deficit was carried out on the basis of a detailed analysis, for each Sahelian country except Chad, of public finances and other key parameters of economic activity during the last decade.

A particular effort was made to arrive at an estimate of the consolidated government accounts, i.e. considering not only expenditures and receipts figuring in the central government budget but those appearing in extra-budgetary accounts, such as special Treasury and operations accounts, and special funds (roads, forests, etc). Where possible, the projections take into account operating balances of state-owned, quasi-commercial enterprises, which if negative diminish financial resources available to the government.

It falls outside the scope of the present summary to repeat the detailed analysis contained in the seven country reports, totalling more than a thousand pages. Based on information collected between May and August 1979, these reports were submitted to the respective governments by the Working Group during the period November 1979-February 1980. Wherever exchanges of views between host government officials and the Working Group justified revisions in the data and/or assumptions underlying the country studies, such changes were taken into account and the projections adjusted accordingly. During this process of exchange of views, the national delegates in the Working Group played a definitive role both as advisors and intermediaries.

The objectives of the present chapter are to:

i. Present summary results of the projections, broken down by country;

ii. Indicate the principal causes underlying the projected de-

ficits; and

iii. Develop the implications of the present and projected future situation for improved programming of investments in the Sahel and their financing.

Projection of the ex ante deficit was based in each case on three assumptions, namely that:

i. Productive capacity created in the Sahel since the early 1970's as a result of recipient-donor cooperation would operate and be maintained at levels projected at the time the capacity was established;

ii. The recipient countries would not change substantially their present macro policies, maintaining present nominal rates of taxation, refraining from devaluation of national currencies, continuing operation of deficit-producing activities, etc.; and

iii. International aid agencies would not modify significantly their aid practices by, for example, increasing general and sectoral budget subsidies beyond present levels (if any), or additional direct financing of project recurrent costs beyond current practices.

The projection horizon used for five countries -- Cape Verde, The Gambia, Mauritania, Niger and Senegal -- was 1984, with 1982 as an intermediate projection year and also the terminal year of the CILSS/Club du Sahel First Generation Program. For the other two countries, Mali and Upper Volta, projections stop with 1982 due to lack of adequate data on which to base longer-term projections.

In accordance with the foregoing assumptions, government receipts and those expenditures not linked to operation and maintenance of development projects were projected mainly by extrapolating observed trends.

Expenditures on operation and maintenance of projects, both existing and planned up to the projection horizon, were calculated by three methods, a single method being applied in each country except Cape Verde where two were applied in tandem.

Following are the three methods in question:

i. Summation. Insofar as existing projects had been thoroughly tabulated and activities planned up to the projection horizon were known with a certain degree of confidence, it was possible to calculated total recurrent expenditure on projects by summing the corresponding expenditure data as contained in project documents. This method was used for two countries, Cape Verde and Senegal.

ii. Extrapolation of trends. This method, used for the Gambia, Mali, Mauritania, and Upper Volta, consisted simply of projecting the principal components of recurrent expenditure on the basis of observed trends, making adjustments where additional information was available.

iii. Use of a macro recurrent cost coefficient. This method consists of multiplying new capacity installed in each year of the projection throughout the public sector by a macro coefficient of recurrent expenditure (which we will symbolize by r_m for "r-macro"). Such a coefficient was utilized for Cape Verde and Niger. It was estimated by dividing the increase in project-related recurrent costs (Niger) or the total current budget of economic ministries (Cape Verde) over a period of years -- 1974-79 for Niger, 1977-78 for Cape Verde-- by gross public investment during those years.

It should be noted first that the recurrent expenditure series projected by any of these three methods differs from the concept of recurrent expenditure developed in Chapter II and applied in the sectoral and project discussion of Part Two. Typically, the data underlying the projections related to concepts of recurrent expenditure applied in government accounts and project planning documents. The expenditure series thus include all operation and maintenance expenditures undertaken after the planned development phase of a project, even in many cases where, according to our earlier definition, this phase is or

will be too short to "establish" productive capacity, and subsequent O & M expenditure should still be regarded as nonrecurrent.[1] In this respect the projections thus overstate recurrent and understate nonrecurrent expenditure, according to the terms of the Chapter II definitions. However, from the viewpoint of projecting the ex ante fiscal deficit, which is the primary object of the macro exercise, it makes no difference whether expenditure is classified as recurrent or nonrecurrent.[2]

Secondly, insofar as previously established productive capacity has been under-utilized and/or -maintained, projections based on past experience tend to extrapolate forward this shortfall. (In the case of the summation method, this problem pertains to the projection of operation and maintenance of already existing rather than new capacity). The consultants responsible for the country reports were on their guard ith respect to this bias and sought to make adjustments accordingly, but a margin of uncertainty remains.

Finally, margins of uncertainty also arise from peculiarities of each of the three projection methods; specifically:

i. Summation. The rate of execution of planned projects over a forthcoming three-to-five year period, and thus the rate at which they will generate O & M expenditures, is uncertain. Planning documents almost invariably underestimate the delays to which project implementation is subject. Thus, projection of O & M expenditure by this method must be based on assumptions with respect to the rate of underspending vis-a-vis stated investment plans.[3]

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1 This is subject to qualification in the case of historical series where a project's original donor or another taking its place, finding that the initially planned establishment phase turned out to be too short, has agreed to finance a second phase (which may be denoted as a consolidation phase), in which case the expenditures are likely to have been correctly classified as non-recurrent.

2 This is because G_1 and I both form components of G (see above, equation 10.5).

3 Thus, for example, in the case of Niger an overall growth rate of 7.6% has been assumed, which is below that used in the country's development plan.

ii. Trend extrapolation. For a variety of reasons, not the least (particularly in Sahelian conditions) being the vagaries of climate, trends are subject to interruption. The pressures to which different components of revenue and expenditure are subject may cause growth rates over the next three to five years to diverge either upwards or downwards from those observed in the recent past.

iii. Use of a macro recurrent cost coefficient. However the macro recurrent cost coefficient r_m is estimated, the corresponding projection method implies that a billion francs of development expenditure generates in each future year the same flow of recurrent expenditure (80 million francs, for example, if $r_m = 0.08$). In fact, the total package of development expenditure in each year consists of expenditures on a wide range of activities that have gestation periods of varying length -- most of them well over a year -- and find themselves in different stages of execution. Moreover, recurrent expenditure early in the projection period will be heavily influenced by development expenditure in the recent past, which is not included in the series to which the r_m coefficient is applied. There is thus every reason for the relationship of future aggregate recurrent and development expenditure to vary from that observed in the past.

XI.2 Projection results

Table 11.1 gives an estimate of the ex post fiscal deficit of seven Sahelian countries in 1978, before taking into account short-term borrowing and emergency assistance, and projects their ex ante deficit for 1972 (all seven) and 1984 (all except Mali and Upper Volta).

It is important to distinguish the conceptual basis of the ex post and ex ante deficits. The 1978 ex post expenditure figures reflect actuals net of any shortfalls that may have occurred in relation to expenditure commitments, i.e. S* in the terminology of Chapter X; while the 1978 receipts entering into the calculations correspond to actual receipts excluding short-term borrowing and emergency assistance. The ex post deficit is thus nothing other than the sum of such short-term borrowing and emergency assistance, in other words it is an estimate of the variable C* or unplanned receipts.

TABLE 11.1

Fiscal "gap" of the Sahelian countries: estimated actuals for 1977 or 1978 and ex ante projections for 1982-84

(- denotes deficit, + denotes surplus; 1982-84 figures given in 1979 prices except for Cape Verde (1980 prices))

	Cape Verde	The Gambia	Mali	Mauritania	Niger	Senegal	Upper Volta	Total ($ U.S. only)
	Fiscal balance in national currency							
	million escudos*	million dalasis	billion M. francs	million ouguiyas	billion F.CFA			
1978	-250	-24.7	-7.2	-5546	+3.0	-4.2	+0.2	
1982	-231	-32.5	-19.6	-1502	-1.6	-11.6	-3±	
1984	-284	-36.5	n.a.	-1341	-7.2	-15.2		
	Fiscal balance in millions of U.S. dollars							
	US$1.00=29.8 Esc.	1.96D	426MF	45 UM	213 F.CFA			
1978	-8.4	-12.6	-16.9	123.3	+14.1	-19.7	+1.0	-165.8
1982	-7.8	-16.6	-46.0	-33.4	-7.5	-54.5	-14.0	-179.8
1984	-9.5	-18.6	n.a.	-29.8	-33.8	-71.4	n.a.	n.a.
	Fiscal balance as percentage of current revenue							
1978	-48%	-37%	-13%	-141%	+6%	-3%	+1%	
1982	-34%	-45%	-23%	-24%	-2%	-8%	-8%	
1984	-41%	-48%	n.a.	-22%	-8%	-10%	n.a.	

n.a.= not available

Source: Consultant reports on respective countries, listed in Annex B, revised by HIID and CRDE on basis of comments received from Sahelian country officials in February 1980 and subsequent statistical reports.

Note: For 1978, the deficit is in ex post terms. It is calculated as the difference between actual expenditures and fiscal receipts plus anticipated capital receipts, foreign and domestic, i.e. to the exclusion of short-term capital receipts (emergency assistance, balance of payments support, etc.) Figures for 1982 and 1984 represent ex ante deficits measuring the difference between expenditure commitments and planned receipts (see explanation in the text).

TABLE 11.2

Key assumptions and procedures underlying consultant projections of Sahelian countries' fiscal balance
(All growth rates expressed in real terms)

Parameter (Base year)	Cape Verde (1978)	The Gambia (1978/79)	Mali (1978)	Mauritania (1978)	Niger (1979)	Senegal (1978/79)	Upper Volta (1977)
A. Gross Domestic Product							
Annual growth rate assumed to 1982 or 1984	6.8% (base:1980 projection)	4%	4%	2%	7%	3.2%	3-5%
B. Recurrent expenditure on development projects							
1. Analysis and summation by individual projects or sectors	*					yes	
2. Macro-level "r" coefficient	.05				.06-.08		
3. Implicit annual growth rate to 1982 or 1984/85	14% (base:1980 projection)			2.5% **		20% (base: 1980/81 projection)	10%
C. Other current government expenditure							
Implicit annual growth rate to 1982 or 1984/85	5.0%			decline	7.3%	2.5%	3-4%
D. Total budget expenditure including B,C, and domestic counterpart of investment							
Implicit annual growth rate to 1982 or 1984/85	6.2%	3.4%	11.6%		11.3%	4.5%	5-7%
E. Government revenue							
Implicit annual growth rate to 1982 or 1984/85	5.2%	2.2%	9.4%	decline	9.2%	3.5%	2-4%

Note: most growth rates indicated under B-E are not explicit assumptions but rather the implicit outcome of detailed projections of individual components of expenditure and revenue.

* For projection purposes consultant uses r_m=0.05, average of value obtained via procedure #1 and macro coefficient estimated from time series.

** Takes account of budget restrictions introduced by Mauritania in 1979.

The projected deficits for 1982-84, by contrast, represent the ex ante deficit between government expenditure commitments and planned receipts. In the absence of policies designed to reduce this "gap", it will be covered by both S* and C*, as was explained in Sections X.2 and X.3 of Chapter X.

The total for all the countries of the 1982 ex ante deficit equals U.S. $179.8 million in 1979 prices. For four of the countries the deficit represents a significant proportion of their anticipated current receipts, exceeding 20 percent of these.[1]

XI.3 The budget gap and inflation

Whenever claims on government expenditure exceed planned receipts, in principle a government can always increase its borrowing from the central bank, tantamount to printing money. This leads to inflation, with concomitant effects on the balance of payments as domestic purchasing power spills over into the foreign sector. With nominal expenditures constant, price increases make real expenditure, ex post, less than was intended at the time of budget formulation. Thus, S* increases. On the revenue side, there is, to begin with, the inflationary deficit financing itself that increases actual receipts (R*) above the planned level (R), thus creating unplanned receipts (hence the asterisk). Secondly, insofar as tax rates are progressive, the additional creation of money due to government borrowing from the central bank increases money income, thus generating more than proportional additional revenue. Finally, the balance of payments deficit attracts

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[1] It should be noted that the concept of current receipts which figures in this ratio is different from total receipts, R, as defined in Chapter X, since it includes only ordinary revenues and excludes all planned foreign assistance, such as project loans and grants.

short-term financing, bilateral or multilateral, adding still another component of C*.

Existence of monetary regulations limiting the Sahelian governments' ability to borrow from their central banks, supplemented by foreign balance of payments support, has enabled the countries of the region to experience, in recent years, inflation rates below the average for industrialized countries. Thus, the average inflation rate of six of the Sahelian countries (Chad, Mali, Mauritania, Niger, Senegal, and Upper Volta) was 8.1 percent per year during the period 1970-77 (in some cases 1970-76), in other words less than the rate of inflation which most industrialized countries experienced during the same period.[1]

No significant change is foreseen in the medium term with regard to monetary control. This reflects the implicit will of the Sahelian governments not to use inflation as an instrument for financing their ex ante deficits.

It should be emphasized that the Sahelian countries have managed to keep their 1970-77 inflation rates within reasonable limits thanks to foreign balance of payments support. Should such assistance not be forthcoming in future, the countries are likely to find themselves obliged to impose much stricter fiscal and monetary discipline in the absence of explicit or de facto devaluation.

XI.4 Constraints on government receipts

With regard to tax receipts, a country has, a priori, five alternative ways of increasing income from this source:

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[1] Source: World Bank: World Development Report, Washington, D.C., 1979. Sahelian inflation rates, must, nonetheless, be interpreted with caution, inasmuch as the corresponding price indices are biased downwards due to inclusion of controlled prices for certain basic consumer items (food grains, meat, etc.).

i. Introduce new taxes;

ii. Increase nominal tax rates above their current level;

iii. Increase the progressivity of tax schedules;

iv. Increase the rate of tax collection, i.e. increase the ratio of taxes collected to those due; and

v. Accelerate expansion of the tax base in real terms.

Study of the tax systems in effect in the Sahelian countries as of the late 1970's (Table II.3) shows that the first three avenues are virtually closed to them. Most of the countries already possess an arsenal of tax measures comparable to those of the European countries, which indeed is no surprise considering that the tax systems are to a considerable extent part of the colonial heritage.[1] In comparison with the European countries one observes merely the low levels or complete absence of inheritance taxes, taxes on gifts and transfers inter vivos, and taxes on urban property, which in other countries go primarily towards financing municipal services and education. However in the Sahel the base for such taxes is very narrow, and any receipts to be anticipated from introducing or strengthening them would most likely be insignificant.

The severity of the tax systems as measured by nominal tax rates and enforcement procedures is likewise comparable to that of the industrialized countries as well as the most "fiscalistes" of the developing countries. Specifically: personal income taxation is highly progrssive; nonintegration of the personal and company income tax schemes, contrary to current practice in France, is tantamount to relatively heavier taxation of company profits; rates of production, sales, or value added taxation are comparable to those in Europe; reliance on export taxes is in general above average. Moreover, an increase in import duty rates above present levels would involve the risk of weakening the competitiveness of productive activity in the Sahel as a result of excessive protectionism. Accordingly:

> it is difficult to envisage an increase in nominal tax rates above levels presently in force in the Sahelian countries.

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[1] Published sources:

i. International Bureau of Fiscal Documentation's periodical tax service: African Tax Systems: Chad (spring 1979), The Gambia (October 1977), Mauritania (February 1976), Niger (spring, 1979) Senegal (July 1978), Upper Volta (July 1977).

ii. Amadou Ouattara: "Les finances publiques du Mali et la théorie générale des finances publiques,"Editions populaires , Bamako, 1975.

iii. John R. Hill: "Sales Taxation in Francophone Africa", Journal of Developing

TABLE II.1

General description of tax systems of the Sahelian countries in effect between 1975 and 1979

Tax Category	Area of applicability	Nominal rates	Comments	Evaluation
I. Direct taxes				
I.1 Personal income tax	all countries	0 - approx. 70%		very progressive system if evaluated on basis of nominal rates
I.2 Company/ Corporation Income Tax	"	45% (The Gambia and, in some cases, Chad) 40% (Mauritania, Niger, Upper Volta) 50% (Chad, in general: Mali) 38 1/3% (Senegal)	Malian case refers to tax on profits of capitalized companies.	system is more severe than the present French tax regime, which gives the individual shareholder a tax credit equal to 1/2 that portion of company tax levied on income out of which dividends are paid.
I.3 Other direct taxes:				
Tax on income from stocks and bonds	Chad	20-30%	incomplete information	
	Mali	18-25%		
	Niger	8-25%		
	Senegal	8-25%		
	Upper Volta	10-27%		
Taxes on wages and salaries	Chad and Upper Volta	apprenticeship tax of 1.2% (Chad) and 3% (Upper Volta)		
	Chad	5% additional tax levied on employees		difficult to compare with other countries
	Mali	5%		
	Senegal	2% on wage and salary payments to citizens and 4% on payments to foreigners		
Tax on real-estate income	Chad	up to 20%	applies to rented or owner-occupied residential property	
	Senegal	3-15%		
	Upper Volta	2% of rental value		
Patriotic contribution tax	Upper Volta			

TABLE 11.3 cont'd

Tax Category	Area of Applicability	Nominal rates	Comments	Evaluation
II.1 Indirect taxes				
II.1 Taxes on production, sales, or value-added	Chad, Mali, Mauritania, Niger Senegal, Upper Volta	tax-inclusive rates: 12.5%(Chad), 20%(Mali), 9%(Mauritania), 18%(Niger) 9%(Senegal), 13%(Upper Volta)	see below[1]	see below[2]
II.2 Inheritance tax	none	certain registration fees and/or stamp taxes on probate documents represent a partial stand-in for inheritance taxes		
II.3 Registration fees and/or stamp taxes	all countries	variable		difficult to compare
II.4 Excise taxes	all countries	variable	applied to tobacco, alchoholic beverages, fuel and automobiles	see below[1]

[1]Comments: Taxes paid by the producer and/or seller, applying as a general rule only to manufactured products and imports, and excluding wholesale and retail trade; applies in some cases to services (taxe de prestation de service); in the case of production and sales taxes, allows deduction of taxes paid on intermediate goods physically incorporated in manufacture of the final product, excluding capital goods.

[2]Evaluation: rates are comparable to tax-inclusive Value Added Tax rates in effect in Europe: Austria (15.25%), Belgium(13.79%), Denmark(16.84%), France(15%), Germany (10.71%), Great Britain (13.04%), Ireland (16.7%), Italy (14%), Luxembourg(9.09%), Netherlands (15.25%), Norway (16.67%), Sweden (17.1%).

[1] Represent 3.9% of total tax receipts in Chad (1976), 1% in The Gambia (1977), 2.8% in Mali (1977), 4% in Mauritania (1978), 5.3% in Niger (1976/77), 7.9% in Upper Volta (1973). Although some countries (The Gambia, Mali) appear to have scope for greater resort to excise taxes, nevertheless these levies apply to luxury goods which figure only to a very limited extent in the local consumption basket.

TABLE II.3 cont'd

II.5 Import duties and taxes	all countries	average import duty rates as reflected by ratio of revenue to CIF import value: 11.5% Chad 1976 17.9% The Gambia 1978 15.4% Mali 1977 19.1% Mauritania 1977 13.4% Niger 1976 14.3% Senegal 1975 21.0% Upper Volta 1973	apart from import duties there is an import tax ranging up to 70%, as well as a regional cooperation tax levied on commodity imports from countries outside the CEAO(West African Economic Community)	rates are comprable to those of other developing countries. Further increase of such duties and taxes could jeopardize the competitiveness of local industries as a result of excess protection.

[1] With the exception of Niger and Senegal, these rates include import taxes in addition to the customs duties. Source: International Monetary Fund: International Financial Statistics.

II.6 Export taxes	all countries	variable	applied in general to specific export commodities (livestock in Mauritania, peanuts in Senegal) except in Mali and Upper Volta which have a general export tax.	presently constitutes in the Sahel a relatively more important source of tax revenue than in other developing countries.

Increasing taxes above their present levels could even, in our view, exercise a disincentive effect on economic activity as a whole, which in turn would reduce the amount of tax receipts via shrinkage of the tax base.[1]

In examining possibilities for increasing the rate of collection or its substitute, the revenue coefficient, defined as the ratio between total revenue and national output, one must also take into account from the beginning efforts already underway to this effect in different countries.

With the exception of Mauritania and Senegal, the Sahelian countries had, during 1972-76, revenue coefficients below the average of 15.8 percent calculated by Tait, Gratz and Eichengreen for 63 developing countries.[2] (Table 11.4). Could they do more in this regard? It must be emphasized to begin with that, even with relatively low revenue coefficients, in the mid-1970's the Sahelian countries were ahead of such countries as Lebanon, Mexico, and the Philippines, all of whom had coefficients below 10.8 percent, the lowest level in the Sahel (not counting Cape Verde, for which income data is deficient).

Since two countries with identical revenue coefficients may actually be demonstrating a different level of tax effort considering differences in economic structure and income levels, Tait, Gratz and

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1 Certain improvements are nevertheless possible, such as transformation of tax rates generally expressed in specific terms -- e.g. francs per unit of product in the case of excise taxes, especially those affecting fuel consumption -- into ad valorem rates, i.e. as a percentage of the unit price. Such a conversion is, of course, especially helpful to public finances in a period of inflation.

2 "International Comparisons of Taxation for Selected Developing Countries," Staff Papers, International Monetary Fund, March 1979, vol. 26, n° 1, pp. 123-156.

TABLE 11.4

Revenue coefficients of the Sahelian Countries

Country	Period	Revenue coefficient (% of indicated base)	Base	Sources
Cape Verde	1977	8.1	GDP	unpublished
Chad	1975	13.6	GDP	unpublished
The Gambia	1972-76	14.9	GNP	TGE[1]
Mali	1972-76	13.0	GNP	TGE
Mauritania	1975	16.0	GDP	unpublished
Niger	1976-77	10.8	GDP	unpublished
Senegal	1972-76	20.2	GNP	TGE
Upper Volta	1972-76	11.3	GNP	TGE
Average of 63 developing countries	1972-76	15.8	GNP	TGE

[1] TGE: A.A. Tait, W.L.M. Gratz, B.Y. Eichengreen: "International Comparisons of Taxation for Selected Developing Countries, 1972-76," Staff Papers, International Monetary Fund, March 1979, vol. 26, n° 1, pp. 123-156.

Legend: GDP: Gross Domestic Product at market prices
GNP: Gross National Product at market prices

Note: Adding non-tax receipts (fees,etc) to tax receipts significantly improves the performance of three countries: the Cape Verdean coefficient increases from 8.1% to 10.5% in 1977, the Gambian coefficient from 12.1% to 16.9% in 1973-74 and the Mauritanian coefficient from 16.0% to 20.9% in 1975.

Eichengreen constructed a tax comparison index (TCI) for the countries in their sample, which included three nations of the Sahel, Mali, Senegal and Upper Volta. For a given country the TCI is a ratio whose denominator is the observed revenue coefficient(revenue/GDP) and whose numerator is the coefficient"predicted" by the model, taking into account certain macro indicators of the government's ability to levy taxes, such as GNP per capita or total exports and non mineral exports as a percentage of national output. A TCI superior to 1.0 means that the country is making a serious effort with regard to tax collection; an index equal to unity signifies a "normal" level of effort; and an index less than 1.0 denotes a relatively weak effort.[1]

For the period 1972-76, the TCI is 0.968 for Mali, 1.021 for Senegal, and 0.955 for Upper Volta, all of which are close to unity, corresponding to a "normal" effort. Moreover, these coefficients remain superior to those not only of Lebanon, Mexico and the Philippines but also Korea, Egypt, Indonesia and Singapore, all being countries with a TCI significantly below unity.

One is nevertheless struck by the discrepancy between the severity of Sahelian tax systems in general, and their actual collection rates. After allowing for authorized tax exemptions, the gap can only be explained by the presence of substantial tax evasion, encouraged by insufficiency of trained tax collectors, as well as by the large expanse of some of the countries, conducive to smuggling.

There is clearly a cost associated with improving the tax collection system. In some situations, the cost of collection may even exceed

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[1] With regard to the details of calculating the TCI and problems of its interpretation, the reader is referred to the original article, cited in the preceding footnote.

receipts, as in the case of a grazing tax levied on nomadic pastoralists.[1] Nevertheless, we believe that there exist in the Sahel as yet unexploited opportunities for re-assigning to tax collection duties, after some complementary training, part of the staff currently engaged in less productive activities in the civil service and/or state enterprises. Improvement of their tax collection systems would represent a net gain for the Sahelian countries.[2]

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[1] See above, Chapter V.

[2] It should be stressed that our objective here is not, from an essentially "fiscalist" viewpoint, to fill completely the gap between nominal and effective tax coefficients. The existence of certain loopholes in the tax legislation compensates for some of the disincentive effects , for economic activity, of an excessively severe tax regime.

Similar to many other countries, both developed and developing, that seek to promote investment in directly productive sectors, the Sahelien countries provide tax exemptions to some investors. The details of these exemptions are too variable from one country to another and among sectors within a country to permit a meaningful summary here. We will confine ourselves to mentioning the frequent granting of "tax holidays" that exempt investors from company income tax during the first five or ten years following establishment of an enterprise, the period in question sometimes extending to as long as fifteen and even twenty-five years. Mention may also be made of the facility granted certain enterprises to import their production inputs free of duty or at a privileged rate.

It is evident that such measures have permitted the establishment of productive investments which would not have been realized in their absence. In toto, however, the net gain from the viewpoint of public revenues may be negative insofar as the Sahelian countries, in granting company tax exemptions, compete not only against one another but also with other developing countries, and even industrialized countries anxious to attract private capital. The net loss threatens to be substantial in relation to a situation in which all countries would enter an agreement not to resort to such exemptions. Finally, it should be noted that economic theory justifies granting tax exemptions to a firm only if it is likely to mount a "learning curve" over the term of the exemption and thus reduce its production costs (the "infant industry" argument.) This point of theory could represent a useful point of departure for re-examination of the system of tax exemptions currently benefiting some companies in the Sahel.

Expansion of the tax base in real terms is limited primarily by the growth of constant-price Gross Domestic Product. Table 11.5 gives growth rates of six of the Sahelian countries for the periods 1960-70 and 1970-76/77, as well as the corresponding average rates for all low- and medium-income developing countries (with per capita products below U.S. $200 and from $200 to $499, respectively (1977 figures).)

TABLE 11.5

Average annual growth rate of constant-price Gross Domestic Product of six Sahelian countries: 1960-70, 1970-76/77

(in percentages)

Countries	1960-70	1970/76-1977
Chad	0.5	0.8
Mali	3.3	3.5
Mauritania	n.a.	2.3
Niger	2.7	1.8
Senegal	2.6	2.8
Upper Volta	3.0	3.3
Low-income developing countries (average)	3.9	3.2
Medium-income developing countries (average)	6.2	6.1

Source: World Bank, World Development Report, Washington D.C., 1979

n.a. = not available

The fact that, over the period 1970 to 1976/77, four of the six countries in Table 11.5 had growth rates below the average of low-income developing countries is not surprising considering the drought which afflicted the region from 1969 to 1974.[1] However, taking the two periods together, 1960-70 and 1970-76/77, one cannot escape the conclusion, particularly taking into account the region's population growth rate of over two percent, that:

> during nearly two decades the Sahelien countries as a whole have experienced a situation close to stagnation.

No one questions that the Sahelien population is poor and that the region's natural environment presents an enormous challenge to any increase in productivity. However, the fact that a country's national income starts out at a low level does not necessarily condemn it to endure slow growth rates indefinitely. During the 1950's the growth performance of the few developing countries in Asia and Latin America that today show satisfactory growth rates was no better than the more recent performance of the Sahelian countries as shown in Table 11.5. Nevertheless these countries succeeded in introducing institutional changes that unleashed the energies of industrious populations and set their economies on the path to modernization and enhanced welfare.

Based on a careful review of the evidence gathered in the technical reports prepared for the Working Group, its consultant members have been led to conclude that, in most cases, expansion of the Sahelian economies and, thus, their tax base is limited by three characteristic elements of current government policies, namely:

i. the tendency of the public sector to use a predominant share of the two critical factors of production, capital and skilled and semi-skilled manpower.

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[1] For a detailed study of the impact of the drought on the Sahelian economies, see E. Berg: "The Economic Impact of Drought and Inflation in the Sahel" (Center for Research on Economic Development, University of Michigan, Ann Arbor, discussion paper n°51, May 1976), distributed at the founding conference of the Club du Sahel held at Dakar in 1976.

ii. the prevalence of official suspicion with regard to the role of the private sector; and

iii. undervaluation of the cost of capital and foreign exchange.

The government's tendency to preempt scarce factors leads it to appropriate, in some countries, up to eighty percent of bank credit on behalf of enterprises which it owns or controls and which it allows to accumulate large operating deficits (in one country the responsible ministry considers that, out of twenty-six enterprises which it controls, sixteen would not be able to survive in 1980 without government subsidies). In certain countries the government commits itself to hire close to one hundred percent of graduates of secondary and higher educational institutions. This commitment unavoidably leads to uncontrolled and non-selective growth, poorly adapted to the requirements of the public service. At the same time it increases personnel costs of the private sector which finds itself obliged, if it wants to attract skilled manpower from the government and its dependent agencies, to compensate them for the loss of job security guaranteed them by the public service.

The prevailing philosophy in the Sahel with respect to the role of the State in economic activity carries with it an attitude of suspicion towards private economic agents other than peasants and artisans. The capacity of the private sector to contribute to national welfare via increased competition on the market for goods and services is denigrated systematically. Arbitrage by private traders in markets characterized by wide price differentials, often arising from State intervention, is regarded as anti-social speculation and profiteering. In fact, it is precisely this State intervention, accompanied by attempts to control prices in markets that are inherently competitive, which gives rise to shortages and obliges the private traders, seeking to protect themselves against the risks inherent in the system, to widen their trading margins. For its part the government also suffers from this state of affairs: it is obliged to devote, to regulatory activities and review of permits and licenses of all kinds, excessive staff time and other resources as compared with the benefit society

derives from them.

Two key factor prices, the formal-sector interest rate and the foreign exchange rate, are pegged at levels below the respective accounting prices or scarcity values of capital and foreign exchange in the various Sahelian economies. This situation arises partly out of inertia--maintaining long-established nominal levels--and partly out of a belief that the path to stimulating production is via cheapening inputs, a view in which the Sahelian countries are far from having a monopoly.

The nominal price of capital is given by the prevailing rates of interest in the organized financial market of each country (Table 11.6). The table shows that interest rates on time and savings deposits have been systematically below the rate of inflation; in other words, the real rate of interest (nominal rate less the rate of inflation) has been negative. Even the lending rates have been frequently negative in real terms, and none has recently exceeded a limit of six percent which is generally considered to be less than the accounting price based on the relative scarcity of capital in developing countries.

The nominal price of foreign exchange is the official exchange rate.[1] The continuously declining trend of net foreign assets of the Sahelian countries, which Table 11.7 shows to have reached negative levels in all countries except Niger, is a conclusive indicator of disequilibrium in these countries' exchange markets, showing that the official rates overvalue the national currencies or, in other words, undervalue the cost of foreign exchange expressed in those currencies.

A certain number of firms and sectors have inevitably benefited from undervaluation of the costs of capital and foreign exchange. Those public and private enterprises which have enjoyed access to credit on the organized financial market, i.e., to cheap capital, have been able to limit their financial losses or increase their operating profits, as the case may be, as compared with a situation in which capital is provided at its accounting price. On the other hand, undervaluation of the cost of foreign exchange has encouraged purchase of imports,

[1] The official exchange rates of the Sahelian currencies as of Dec. 31, 1979, are given on p. xv at the beginning of this report.

TABLE 11.6

Nominal and real interest rates in the Sahel, 1974-79

Country/Year(s)	(1) Nominal interest rates* Time or savings deposits	(2) Nominal interest rates* Commercial bank loans (max)	(3) Average annual change in consumer prices	(4) Real interest rates Time or savings deposits (1) - (3)	(5) Real interest rates Commercial bank loans (max) (2) - (3)
Cape Verde 1976-77	6%	8%	9.2%	-3.2%	-1.2%
Chad 1976-77		12.5%	6.3%		+6.2%
The Gambia 1974-79	6%		13.8%	-7.8%	
Mali 1974-76	3.5%		16.8%	-13.3%	
1979	6%	14-15%	14.9% (1977-78)	-8.9%	0%±
Mauritania 1979	3.75-5.75%	9-11%	7.7%	-2 to -4%	1-3%
Niger 1976-79	5.5%	13%	13.9%	-7.5%	0.9%
Senegal 1976-79	5.5%	13%	7.5%	-2%	+5.5%
Upper Volta 1976-79	5.5%	13%	17.1%	11.6%	-4.1%

* Source: Central banks of the respective countries

** Source: for all countries except Cape Verde, Mali and Mauritania; IMF, International Financial Statistics, April, 1980. Cape Verde and Mauritania: consultants' estimates; Mali: consumer price index, food segment, uncontrolled markets (Central Bank of Mali, Quarterly Bulletin, Bamako, March 1979, pp. 15-16).

TABLE 11.7

Net foreign assets of monetary institutions in the Sahel: 1973-79 (December 31)

Country	Units	73	74	75	76	77	78	79
Chad	billions F.CFA	-1.0	-0.2	-5.3	-0.4	-2.3	-4.5	n.a.
The Gambia	millions Dalasis	28.9	5.2	61.1	49.9	38.4	21.0	-14.8
Mali	billions M. francs	-46.0	-64.0	-89.7	-105.6	-98.2	-100.8	n.a.
Mauritania	millions Ouguiya	341	1534	2	-14	-1969	-2757	n.a.
Niger	billions F.CFA	11.9	20.7	11.0	18.7	23.4	20.0	n.a
Senegal	billions F.CFA	-3.4	-5.9	-10.3	-10.7	-12.9	-35.8	n.a.
Upper Volta	billions F.CFA	15.3	17.3	15.9	12.6	5.9	-1.3	n.a.

n.a. = not available

Source: International Monetary Fund, International Financial Statistics

at the same time stimulating overinvestment in capital goods which it has made relatively less expensive (in financial terms) to government and a limited number of firms. Undervaluation of the cost of foreign exchange, and thus of imports at the official exchange rate, has necessitated the institution of import tariffs and quantitative restrictions designed to protect local producers of import substitutes. This has allowed some producers to attain levels of production which a free-market situation would undoubtedly have denied to them.

Nevertheless, the overall impact of undervaluation of scarce factors remains negative. National saving is discouraged in the face of interest rates that are already low in nominal, let alone real, terms. Distribution of the diminished stock of financial capital for the most part ignores the needs of small and medium enterprises which lack credit-worthiness on the organized credit market and which, consequently, have to do their borrowing on the unorganized or curb market where interest rates may exceed fifty percent per annum. The prevailing exchange rate gives little encouragement to exporting firms, which are prevented from benefitting from the economies of scale that would be assured to them by a stronger world demand, brought about by a readjustment in the rate of exchange.[1] Finally, undervaluation of the costs of capital and foreign exchange induces neither producers nor government agencies to look for technologies of production, operation and maintenance more appropriate to the countries' real factor endowments, particularly those intensive in the use of unskilled manpower. The utilization of capital-intensive technologies, permitted by an excess of inexpensive capital, remains the general rule.

In the light of these findings the Working Group's consultants are of the opinion that:

> expansion of the Sahelian countries' tax receipts is dependent mainly on expansion of the real tax base; however, in the absence of significant changes in present national policies, this expansion is far from assured.

[1] It should be recalled that the rate of exchange measures the number of local monetary units (francs CFA) required to purchase a unit of foreign exchange (US$ 1.00); if the rate increases, depreciation (or devaluation) of the national currency takes place, and if it declines the currency appreciates (or is revalued).

Finally, under the heading of receipts it remains to consider what possibilities are still open to the Sahelian countries to cover their deficits with the help of short-term borrowing other than inflationary borrowing from the central banks, covered in Section 11.3. As of February 29, 1980, the region's net outstanding drawings on the International Monetary Fund amounted to SDR 89.7 million (IMF General Department) plus SDR 75.4 million under the Trust Fund for a total of SDR 165.1 million, equivalent to U.S. $215 million at the then prevailing dollar/SDR exchange rate. The region's reserve position in the Fund, representing its access to unconditional future drawings, was only SDR 11.7 million (6.7 million, or U.S. $8.7 million, if Niger is excluded).[1] In other words, to all intents and purposes any future drawings from the Fund will be conditional on each country's justifying its needs to the Fund and giving satisfaction with respect to future economic policies. There is no basis for any prediction as to how much additional credit the Fund would be likely to extend in the foreseeable future.

Turning to short-term domestic financing, we referred in Section 11.3 to the regulations that limit government borrowing from the central banks. It is well known that some increase in the money supply, in line with the growth of Gross Domestic Product, is necessary. Accordingly, the regulations of the West African Central Bank (BCEAO) allow it to provide credit toward financing the budgets of its member countries, bringing about a corresponding increase in the money supply. The total amount of such credit outstanding at any time to a member country may not exceed 20 per cent of the country's government revenues in the preceding fiscal year. As of the end of 1979 BCEAO claims on its Sahelian members (Niger, Senegal and Upper Volta) did not exceed more than five percent of their annual revenues. In the case of the other states, which have their own central banks, this percentage was considerably higher--more than 150 percent for Mali, over 50 percent for the Gambia and about 30 percent for Mauritania).[1] Apart from the finance which the Sahelian countries may be able to obtain up to certain limits from their central banks, we have already noted their recourse to other sources of finance (arrears, reallocation of earmarked receipts, borrowing from other financial institutions, etc.)

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[1] These figures were obtained from the IMF's International Financial Statistics.

In general, it appears that only minimal scope still remains for squeezing additional resources out of the domestic financial systems.

XI. Constraints on the expenditure side

The preceding review of constraints imposed by national policies on expansion of the Sahelian countries' tax base has implicitly illuminated the two principal constraints which affect the volume of public expenditure by making these particularly rigid on the down side: firstly, the need to pay rapidly growing numbers of civil servants, and secondly, the obligation to finance operating deficits of state-owned enterprises. Once can say without fear of contradiction that, in a situation of substantial ex ante government deficits, additional expenditures under these two heading carry a decreasing return from the viewpoint of society as a whole.

1. Expansion of public sector employment. Where the data permitted, we have calculated rates of growth of the public service in the Sahel. An average annual increase of five to six percent was observed, and appeared to be highly stable, i.e., not sensitive to current fiscal circumstances. It is true that there are strong pressures -- inter alia rising from operating needs of development projects--for increases in the government staffing. On the other hand, it is also true that hiring an additional public employee in conditions of budget stringency may carry a high opportunity cost for these same projects. This is because, in tight budget conditions, payment of an additional salary almost invariably brings with it a reduction in funds available to purchase materials and supplies.

For purposes of illustration, in Table 11.8 we give, for six Sahelian countries during the period 1974-1976/77/78, the observed ratio between government expenditures on materials and supplies as opposed to salaries. Both series are in current prices The high ratio for Mauritania doubtless reflects the situation of armed conflict which faced this country during the second half of the 1970's. More interesting for purposes of the present discusson is the case of Niger, where government receipts on account of extraction and sale of uranium have permitted it to double the ratio as compared with those observed in Mali and Upper Volta. The ratio has remained relatively

TABLE 11.8

Ratios of expenditures on materials and supplies to expenditures on salaries, six Sahelian countries, 1974-1978

Year	1974	1975	1976	1977	1978
Country					
Chad	0.44	0.46	0.39	0.32	n.a.
Mali	0.30	0.27	0.27	0.28*	n.a.
Mauritania	0.55	0.59	0.62	0.73*	n.a.
Niger	0.51	0.64	0.65	n.a.	n.a.
Senegal	0.35	0.42	0.36	n.a.	n.a.
Upper Volta	0.77	0.25	0.25	0.25	0.28

* Budget estimates

n.a. = not available

Source: consultant estimates

stable over time for Senegal and Upper Volta, while declining in Chad and Mali. However it should be emphasized that maintenance of a stable ratio in current prices has to all appearances corresponded to a decline in the constant-price ratio, since the prices of imported products (in particular, fuel) have increased more rapidly than average wages in the civil service. In other words, it can be stated that in four of the six countries represented in Table 11.8, a government employee had less materials and supplies at his disposal in order to carry out his assignments in 1977 than in 1974. Concretely, such a situation may signify that, due to a lack of fuel, agricultural technicians in the Ministry of Rural Development remain in the capital or at district headquarters and lose contact with the field, or that nurses are unable to provide care due to lack of drugs.

It has already been mentioned that some of the governments are committed to employ virtually all graduates of secondary and higher education. Such a policy may have been justified during the years immediately following independence, when it was necessary to replace as rapidly as possible the expatriates from the former colonial power who occupied key positions in the administration. However, after these positions were filled with local personnel, political pressure remained to ensure employment in the public service to new generations of educated young people.

Several of the governments feel that, for essentially political reasons, they cannot now introduce a selective system of civil service recruitment, based on review of grades and other measures of potential or competitive examinations. We believe that these political factors will continue to dominate the situation as long as the governments underestimate the capacity of the private sector to play a dynamic role in expansion of economic activity overall and employment creation in particular. A change in the prevailing attitude, supported by appropriate incentives to the private sector while maintaining competitive markets, would in our view alter the situation and permit this sector to attract an increasing number of graduates at a reasonable scale of remuneration.

The opportunity cost which this staff development system imposes

on Sahelian governments is illustrated by the suggestion repeatedly made to the Working Group that computation of the recurrent costs of projects in the field of education should include the personnel costs which governments will eventually have to bear in employing the graduates of new or expanded institutions. The attitude that graduates should be viewed in the first instance as a fiscal "burden" rather than a resource for development may reflect an intuition that hiring in some services has gone beyond the point where new employees can be expected to return a positive net social benefit in the foreseeable future.

2. Operating deficits of state-owned enterprises. The country studies carried out on the Working Group's behalf indicate that in several Sahelian countries state enterprise deficits are proving to be a drain on resources that would otherwise be available to finance other public sector commitments. Mention has already been made of the large share of bank credit (up to eighty percent) preempted by these enterprises. The problem, which is a complex one, does not stop there.

Public enterprises frequently enjoy a monopoly position, accorded to them by the government, in the import and/or export as well as internal distribution of specified commodities. This privilege permits them to impose distribution margins or benefit from scarcity rents that are higher than those that would prevail in a situation of competition, and should properly be considered government revenue. In other words, the award of trading monopolies to state-owned enterprises results in understating their operating deficits and foregone government revenue.

In Sahelian conditions the practice appears to be partially offset by government policies that seek to combat inflation by compressing distribution margins, particularly in cases of items of basic necessity. Here the effect from an accounting viewpoint is to shift the burden of consumption subsidies onto the budgets of the state enterprises concerned, leading to increased operating deficits.

The financial stability of Sahelian state-owned enterprises is likewise jeopardized by the political imperative to compensate for lagging job creation in the private sector. The motive of economic survival

that tends to compel new employees in private companies either to learn how to do the job and be seen to earn their wages or be fired is clearly less effective in the public sector. Public sector employees know that job retention does not depend on productivity, and managers know that, as a last resort, the Treasury will bail them out when proceeds fail to cover the cost of an inflated payroll.

During the period of the study the Working Group heard many statements of concern by responsible Sahelians regarding the poor performance and excessive role of state-owned enterprises in their countries. Some countries have prepared reorganization plans for all or some of the enterprises. Management consulting services have been provided to some of them. Intentions have been announced to spin some loss-making operations off to the private sector or at least to remove their official protection against competition from private firms. But the Working Group's consultants remain convinced that, in the foreseeable future, in the absence of concerted policies more favorable to development of the private sector, no major reduction can be expected in the volume of public funds preempted by the state enterprise sector in the Sahel.

Chapter Twelve: CONCLUSIONS OF THE MACRO ANALYSIS

The possibilities open to a government to ensure adequate financing for operation and maintenance of development projects are inextricably linked to its overall fiscal situation, as well as to the choices it makes and constraints imposed on its resource allocation policies. The quantitative expression of a government's overall financial position is the ex ante fiscal deficit, defined as the difference between expenditure commitments, current and capital, and anticipated receipts from taxes, grants and loans.

In the medium term (1982) this deficit is estimated at U.S. $179.8 million for the Sahel as a whole, excluding Chad. The implications of such a deficit on the operation and maintenance of development projects have been amply illustrated in Part Two of the report, where it was shown that they can take two major forms: inadequate operation and maintenance of existing capacity, or a need to limit the growth of some sectors, especially the social sectors, to a rate incompatible with the satisfaction of basic human needs. In the context of present policies the constraints to which both expenditures and receipts are subject give the deficit a structural character.

Insofar as the Sahelian countries seem implicitly to reject inflationary financing of their ex ante deficits, their only recourse on the supply side is the possibility of increasing their tax revenues. Except for possible improvement in tax collection performance and a modification of the system of tax exemptions granted to certain investors, expansion of tax revenues in the Sahel is dependant on growth of the tax base in real terms, itself determined by the rate of expansion of general economic activity. At the present time, possibilities for such expansion are limited by certain aspects of official policies in the Sahelian countries, notably the tendency of government and the public sector in general to use a predominant share of scarce resources--capital and skilled and semi-skilled manpower; an attitude of suspicion vis-a-vis the private sector; and under-valuation of the cost of capital and foreign exchange, discouraging the growth of productive saving and encouraging overinvestment in some segments of the economy, at the cost of creating job openings for unskilled manpower.

With regard to public expenditure, the necessity, determined mainly by political factors, to provide graduates of education and training institutions with guaranteed employment in the public sector, together with government's obligation to finance, as a last resort, operating deficits of state-owned enterprises, leaves very little margin of flexibility in the allocation of public funds to socio-economic objectives of obvious benefit to the general welfare.

The elements of an eventual change in the situation are to be sought in a concerted policy designed to encourage the development of a dynamic private sector via transfer to it of certain functions currently monopolized by the public sector, as well as by creating conditions of access to credit and skilled manpower for small and medium-scale enterprises.

Clearly the impact of the adoption by the Sahelian countries of such changes in their present policies would take some time to work itself out, during which time significant adjustment costs--economic, political and social--would be incurred. The donors should recognize the existence of such costs and be ready to modify their own aid policies and practices accordingly.

With respect to the planning horizon, we do not expect a balance between expenditure commitments and anticipated revenue before 1990, and even meeting this target will require that the necessary changes start being introduced in national policies from 1980-81 on.[1]

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[1] Our selection of the year 1990 in this connection does not correspond to an expansion of our projections up to that year, assuming appropriate changes in host government and donor policies. Rather, it is based on the fact that most projects currently in place were initiated in the second half of the 1970's and that the maximum period between initial investment expenditure and commencement of normal operation is in the range of 12 to 15 years (see above, Chapter IX, Section IX.1).

If by 1990 we can anticipate on the foregoing assumptions that the Sahelian countries will be approaching ex ante fiscal equilibrium, the recurrent cost problem defined in a broader sense will nevertheless not have ceased to exist. Indeed, the Sahelian countries may legitimately point out that their true fiscal deficit is the gap separating available resources from the expenditures that they would have to carry out in order to win their struggle against poverty. This poverty is expressed by a regional per capita GNP, in 1977, of U.S. $190, a life expectancy at birth of around 40 years, a mortality rate of 32% for children under 4 years of age, and an adult literacy rate not exceeding 10%. It is likewise illustrated by the fact that less than 30% of the population has direct access to potable water, less than one third of school age children are enrolled in school, and food consumption frequently satisfies only 75% of daily calorie needs.

We recall that the ex ante fiscal deficit projected in this report takes into account only operation and maintenance expenditures associated with existing and planned projects. Actually, looking at programs in the fields of education, health and nutrition, however much the establishment of these activities may seem to have cost, they have been designed for very modest levels of operation in comparison with the dramatic needs of the Sahelian population.

In other words, if the year 1990 may be considered a target year for elimination of the ex ante government deficit, based on the present rate of project establishement, such a horizon would nevertheless have to be reconsidered in the event the Sahelian countries decided to establish more ambitious objectives for enhancing rational welfare through accelerated investment, particularly in the social sectors.

It should finally be stressed that nothing in our approach permits us to state that an ex ante equilibrium in the government accounts would necessarily correspond to the highest growth rate obtainable from efficient use of a nation's factors of production. An answer to this question would require a reevaluation of existing and future public investment programs, going well beyond the mandate given to us by the CILSS and Club du Sahel.

PART FOUR

THE MOBILIZATION OF INTERNAL AND EXTERNAL RESOURCES FOR FINANCING RECURRENT COSTS

Chapter Thirteen: THE SAHELIAN COUNTRIES: INSTRUMENTS AND MEASURES OF ECONOMIC POLICY

XIII.1 The solution to the recurrent cost problem does not lie exclusively with an increase in external resources

Between 1977 and 1978, the latest period for which statistical information is available, disbursements of public development assistance to the Sahel increased by 50.3% in nominal terms, while those to developing countries as a whole increased by only 14%. Thus, the Sahelian countries received in 1978 an amount of public assistance per capita equal to U.S. $38.00, representing approximately 4 times the average for all developing countries in the same year.[1] It would however be naive to believe that the solution to the recurrent cost problem should be sought exclusively by way of continuation, let alone expansion, of the donors' effort. Factors to be taken into account include:

i. The dramatic consequences of the drought in the 1970s made the Sahel a relatively privileged target of concessionary foreign aid funds during the last decade. Subsequently, the serious tensions afflicting the international political order at the end of the 1970s have given other countries or regions of the world priority status in the distribution of aid (Pakistan, Turkey, Indo-China, Central Africa and Central America). Moreover, the current inflation of petroleum prices is causing severe dislocation in the balance of payments of nearly all non-oil-exporting developing countries, particularly those with a larger industrial base than that of the Sahelian countries. Inevitably, the Sahel will be competing with the foregoing categories of countries/regions in the world-wide distribution of public development assistance in the

1. Source: Club du Sahel, "Note on the growth of public development assistance to the Sahelian countries, 1974-78", mimeo, Paris, March 1980.

early 1980's.

ii. The governments of the donor countries, where inflation and a slowdown in economic activity have diminished real resources available for the implementation of domestic programs such as education and research, maintenance and expansion of social security systems, etc., are subject to increasingly severe questioning by public opinion concerned about utilization of the taxpayer's money. It is understandable that aid-receiving countries where per capita income often represents only 2-2.5% of that in the donor countries find it difficult to appreciate this problem, but it must nevertheless not be underestimated. Influential citizens in donor countries -- legislators, businessmen, leaders of the communications media, even trade unionists -- are posing ever more pointed questions about the form and objectives of aid, even if some of the questions seem to reflect traces of a neo-colonialist mentality: "What is the net impact of our aid? What would happen in the recipient countries without it? When we give aid for activities of high economic priority, is its effect simply to free the recipient's domestic resources, as limited as they are, to undertake activities of lower priority? Does reliance on aid merely postpone the introduction of rigorous policies to mobilize domestic resources and economize on nonessential uses -- policies that any developing country must sooner or later adopt if it wants to embark on self-sustaining growth?"

iii. Finally, the Working Group's consultations with representatives of donor agencies indicate that the donors are not about to rush

headlong into fresh modes of aid transfer -- explicit financing of recurrent costs of development projects, general or sectoral budget subventions -- that would provide immediate solutions to the problem of recurrent cost financing. Their reticence is explained by a number of factors, among them being budget procedures that require adherence to a specific project approach restricted to investments; a fear that explicit financing of recurrent budgets would evolve into an open-ended commitment from which they would eventually be able to extract themselves only at high political cost; as well as a fear that such commitments would involve them directly in the recipient governments' budget control procedures.

Accordingly:

> A realistic solution to the recurrent cost problem must be sought in part, if not primarily, via domestic policy measures to be taken by the Sahelian countries themselves.

As the Working Group has established, the governments of the Sahelian countries are aware of these realities of international cooperation. They also understand the restraints that excessive external financing would impose on their sovereignty.

XIII.2 Classification of instruments and measures of domestic policy

In the Sahel, as elsewhere, the ultimate objective, explicit or implicit, of economic and social development polciy is to maximize the present value of the aggregate utility enjoyed by the population in consuming local and imported goods and services, subject to equitable distribution of the benefits of growth and valuing factors of production

at their accounting prices. In the last analysis, it is on the basis of its impact on achievement of this objective that the effectiveness of any measure proposed must be assessed.

With a view to solving the recurrent cost problem the Sahelian countries may draw, a priori, on a set of instruments and measures which it is convenient analytically to classify under the headings of micro and macro.

The micro side consists of policies and measures designed to improve the programming of expenditures associated with the establishment and operation of a particular project, activity or sector, as well as possibilities for cost recovery in the same activities. Considerations on the macro side are governed by the principle of fungibility of government receipts[1], and point on the one hand towards mobilizing a larger share of existing resources towards financing of recurrent costs, and on the other hand towards increasing total government receipts. Inasmuch as the discussion in Parts Two and Three of the present report has already touched on a number of these policies and measures and recommendations are offered in Part Five , the present chapter will deal with them in summary form.

XIII.3 Micro-economic instruments and measures: programming of expenditures

Considering the important role which donor agencies have played in the design of the projects supported by them in the Sahel, which frequently includes furnishing technical assistance personnel specialized in this area, the present section is addressed as much to the international finance agencies as to the Sahelian countries. Nevertheless it is the

1. See above, Chapter X, Section X.1.

Sahelian countries that bear, in the last analysis, political responsibility for the substance and form of project activities. It is therefore appropriate to include the subject of expenditure programming in the chapter devoted to instruments and measures which can be undertaken by these countries.

1. Improving the flow of information

The first and most obvious measure under the heading of expenditure programming is to improve the flow of information about recurrent cost implications of development activities. Each year Sahelian planners are confronted with requests for additional funds to finance project operation and maintenance expenditures. In some cases the unanticipated need for additional money arises from undue optimism on the part of project designers with respect to possibilities of cost recovery. In other cases it arises simply from underestimation of costs, corresponding, as the case may be, to oversight, inefficient project implementation, or failure to take into account rising costs as several projects implemented at the same time find themselves competing for the same scarce resources (capital, foreign exchange, skilled and semi-skilled manpower).

In any case on the basis of our investigations it seems clear that the burden of recurrent costs on national budgets in the Sahel has not been receiving the attention that it deserves. In our view the benefits to be gained, at this stage of Sahelian development, by devoting increased attention to the problem exceed the cost of devoting time and human resources to the required planning effort.

A number of project documents examined by the Working Group make only passing reference to operation and maintenance requirements, estimating these in an offhand way that leads most frequently to underestimation of the cost that will have to be borne by the recipient government. Even

when the cost forecasts are of good quality, we have noted with some surprise that they are rarely known to local planners, who have not had access to the relevant documents prepared by the donor and/or its consultants. It is symptomatic that only in the cases of two Sahelian countries (Cape Verde and Senegal) did the Working Group's consultants succeed in projecting total recurrent expenditure on the basis of estimates given in project documents, and only in one case (Senegal) was the information available at a central location in a national government agency.[1]

Whatever the margin of error to which the projection methodology may be subject, it should nevertheless reduce considerably the uncertainty associated with medium-term budget projections and, thus, that encountered in decision-making about cost recovery and programming of future investments. It thus seems to us highly desirable that a unit in the finance and/or planning ministry of each country should be assigned responsibility for collecting, as a regular function, all information concerning the government's recurrent expenditure commitments. Whatever its actual bureaucratic position, this unit would have, inter alia, a mandate to request donor agencies and their consultants to share all relevant information with it, as well as to improve the quality of the information.

Part Two of the present report, concerned with sectors and projects, has laid a basis for identifying a number of approaches that would enable the Sahelian countries to minimize the burden of recurrent costs on the national budget. These are:

i. comparison of operation and maintenance implications of alternative project designs;

ii. use of an accounting price to value financial resources avail-

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[1] See above, Chapter XI, Section XI.1.

able to cover project recurrent costs;

iii. paying greater attention in the project design phase to, on the one hand, uncertainties associated with project implementation and operation, and, on the other hand, insufficiency of relevant information;

iv. continuous review of project performance accompanied by re-scaling of activities to maximize net benefit for society.

The remainder of the present section is devoted to an examination of these four points.

2. Comparing implications of alternative project designs

Once a project has been implemented, the mode of its operation and maintenance is largely determined, and there is much less flexibility for analysis of alternative patterns for attaining the project objectives. By contrast, if special attention is paid to operation and maintenance characteristics from the start of the design phase, the planner will have several alternatives to consider from which he can choose the most appropriate pattern taking into account the nation's factor endowment and policy objectives. For example, with civil engineering works such as roads and buildings there are alternatives which offer a trade-off between sturdiness (costly initial investment) versus intensity of maintenance.[1] Projects in directly productive sectors such as agriculture, livestock, fisheries, and forestry are subject to alternative modes of operation with respect to density of government staff per thousand target participants, or the respective role of government and private traders in the supply of inputs or marketing of output. Once alternative patterns of O & M have been outlined, it is the planner's job to "plug" into them an accounting price

[1] It should be noted that this applies only at a comparable level of utilization of the facility. Thus, a paved road subject to heavy traffic may have maintenance requirements, per kilometer, exceeding those of a lightly travelled dirt road (see above, Chapter VII, Table 7.2).

for uncommitted government revenue (see the following section) as part of the process of selecting the project alternatives with the largest contribution to social welfare.

3. Use of an accounting price to value fiscal resources

Discrepancies between prices observed in the market and values reflecting the relative scarcity of factors of production oblige project designers to use, in valuing factors employed in project implementation and operation, a set of prices different from those actually observed; these are known as accounting prices. The use of accounting prices frequently leads to different investment choices from those indicated by use of market prices. Fiscal stringency such as that currently affecting the Sahelian countries requires that, in addition to accounting prices for the standard factors of production, an accounting price should be applied to uncommitted government revenue, i.e., total revenue less fixed obligations for items such as the civil service payroll, public debt service, counterpart contributions to aid projects, etc.

Most of the Sahelian countries have reached a point where the administration cannot afford to provide many of its offices with the complements they need to carry out their functions -- e.g. fuel for inspection vehicles, bandages for health workers, etc. In such a situation, the opportunity value or accounting price that should be applied to additional government revenue of, say, one million francs CFA is actually greater than this amount. Thus, for example, if a vaccination team sits immoblilized at headquarters due to lack of a budget allocation for transport costs, it is clear that providing it with a million francs to purchase fuel, etc., will have a positive impact on the welfare of the community valued at more than one million

F. CFA, given that the vaccination program can now proceed.[1] In general, given the political factors that militate against reducing personnel emoluments, it is above all the budget category of "materials and supplies" that exhibits a social value well above its nominal value, and well above the social benefits that may be generated by expenditure on new projects, whether recurrent or nonrecurrent.

Use of an accounting price coefficient above 1.0 for valuing uncommitted government revenue would place a premium on activities and project design alternatives that economize on budget financing of recurrent costs, or even generate net revenues to finance other activities. Ceteris paribus, such a procedure would favor alternatives that attract relatively greater private sector participation and engender cost recovery via user charges.

Such a procedure is not to be confused with minimization of recurrent costs per unit of installed capacity as an absolute criterion of project selection (and, moreover, an erroneous one because it takes no account of comparative socio-economic benefits of different project alternatives). Rather, it merely involves giving proper recognition, beginning at the stage of project design and selection, to the importance of present and anticipated future government budget constraints, just as use of other accounting prices in current project evaluation practice takes account of constraints imposed by official policies in the traditional factor markets.

Admittedly, calculating a precise value for this new accounting price is not an easy exercise. In principle, one would have to run iterations on alternative budget expenditure packages and establish which accounting

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[1] In economic terms, the marginal return of a unit of government revenue in this case equals the entire socio-economic benefit generated by the function that could otherwise not have been carried out.

price reduced to zero the net present value of the lowest-yielding use that just exhausted available revenue. In practice, such a procedure is scarcely feasible. Even a second-best procedure that merely sought to estimate the benefit foregone from future activities and projects likely to be rejected at the margin due to fiscal stringency would be a complex and difficult exercise.

Instead, it is suggested that a feasible approach would be to begin with sensitivity analysis of project net present values (or internal rates of return, for analysts preferring those), multiplying the uncommitted budget resources allocated to the project or net revenues it generates by a cofficient ranging between, for example, 1.5 and 2.0. If repetition of this process for all major projects led to substantially different rankings of projects--for example, in decreasing order of net present values--such an outcome would justify a joint effort by donors and recipients to arrive at a more precise value of the accounting price for uncommitted government revenue. Moreover, such an exercise would have heightened awareness of the problem and demonstrated the importance from various points of view of recognizing the government budget constraint early in the stage of project design and selection.[1]

Accepting the principle of an accounting price greater than unity for uncommitted government revenue, economic logic compels us to assign a coefficient of less than 1.0 to foreign aid resources tied to the implementation of projects to which the donor accords higher priority than the recipient government. Obviously a government always prefers to receive general budget support which it can allocate at its discretion.

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[1] Appendix D below illustrates this procedure by means of a hypothetical numerical example.

However, for reasons indicated in the first section of this chapter such support does not form the major part of public development asssistance supplied to developing countries, and this situation appears unlikely to change. More frequently, the recipient country is faced with the choice of either accepting aid for specific projects or sectoral activities designed according to standards acceptable to the donor, or seeing the donor take its money elsewhere. In other words, it is very difficult for developing countries, and particularly those with the lowest income levels, to oppose donor preferences even if the resulting national package of activities is very different from what the recipient government would have chosen to implement had the same resources been available to it in the form of general budget support.

The more insistent the donor is with respect to the particular end-uses for which it will provide aid, the lower the accounting price the recipient attaches to the aid, inasmuch as it lacks the option of allocating the money to alternative uses.[1] From the viewpoint of the general problem that concerns us, this might mean that the government will subsequently allow part of the capacity installed with the help of tied aid to deteriorate, preferring to use its own revenues for other expenditure objects to which it gives priority. Nevertheless, recipient governments retain a margin of flexibility in such a situation, namely, to minimize, in the planning stage, the approval of low-priority aid-financed projects with a view to avoiding a situation where future government resources are tied up in financing the recurrent costs of such projects. Among other things, this implies a political effort to temper the enthusiasm of some local

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[1] The accounting price of this aid is, of course, simply its opportunity cost (see above, Chapter II, Section II.9).

officials (or private interest groups) for projects established outside national priorities.

4. Paying greater heed to uncertainties and information gaps

Part Two's analysis of projects and sectors demonstrated the existence in the Sahel of a number of activities, implemented by host governments with the support of the international community, whose "technological" content in a broad sense, i.e., including biological, administrative and socio-economic aspects, is still imperfectly understood. In spite of limits that may be imposed by donors, it is still open to the Sahelian countries to reconsider such projects by studying alternative patterns of operation, limiting the impact of the project on the population (the approach phase), or by introducing sufficient flexibility in the project execution to ensure that it can benefit regularly from the enhanced information conveyed by the lessons of experience. Putting such findings into practice will inevitably increase the capacity for cost recovery and thus alleviate the burden on government budgets.

5. Regular project performance review and rescaling

An important principle of maximizing social net benefit is that all resources expended on or irrevocably committed to an activity up to a given point in time should be regarded as sunk costs, in the sense of not being allowed to influence future expenditure choices. For example, consider a road that is not of sufficient importance to justify its reconstruction should an earthquake destroy it; nevertheless the road is used and receives a minimum amount of maintenance. Construction expenditures are considered here to be irrecoverable--no donor would be willing to finance the road's reconstruction, nor has the government ever thought of establishing a sinking fund to recover the construction cost.

As this example shows, the principle of sunk costs applies to developed just as well as to developing countries; in both cases, one finds some installed capacity whose use and maintenance at any level is tantamount to obtaining a negative social return on expenditure. In such situations the most reasonable decision is either to shut down an operation or to operate and maintain it at less than design capacity, allowing part of the infrastructure to deteriorate. This is of course not always easy. Some groups in society are likely to have a vested interest in seeing the operation continue. If, moreover, the project was financed by a foreign donor, the latter may face embarassing questions from its own taxpayers.

Insofar as such projects exist in the Sahel--and as we saw in Chapter IV, the agricultural sector, for example, is not exempt from the problem--the governments should try to convince both their own public opinion and the donor that a serious attack on budget stringency demands rescaling if not closure of such operations.

An appropriate policy of rescaling presupposes an approach akin to the "zero-base budgeting" that has recently gained favor in several industrial countries. The procedure consists of evaluating a government agency's budget submission not simply with respect to the incremental changes proposed, but rather in terms of the entire agency program including activities already in progress, so as to determine whether the program is generating a positive net benefit for society. If the political obstacles to closing down an unproductive government activity in the Sahel are no less than in an industrial country, the opportunity cost in terms of social welfare of preserving such an operation is considerably higher in the region, considering the enormous needs of its population.

XIII. 4 Micro instruments and measures: cost recovery

In considering the issue of cost recovery, one must guard against the assumption that the higher the rate of cost recovery, the better. If a project generates public goods in addition to private benefits--human and animal health, education, rural water supply--then charging users of installed capacity--patients, students, herdsmen--a user cost that exceeds the marginal cost of producing the private benefits carries the risk of reducing the use of such capacity to a point where its continuation may yield a negative social return. For example, if the herdsman is required to pay more than the cost of the vaccine, the difference going towards the costs of ministry of rural development headquarters personnel, not only will he very soon be aware of this, knowing the market price of the vaccine, but there is a danger that he will remain outside the vaccination program, thus increasing the danger of disease for the rest of the cattle herd in the area. Subject to this qualification, our sectoral and project analysis has illuminated a number of areas in which increased cost recovery would be not only feasible but eminently desirable.

Some of the countries in the region adhere to a philosophy, often by virtue of tradition, according to which a kind of social contract obliges them to render their services gratis, e.g., in the fields of human and animal health. It is of course true that the production of such services generates public goods and a certain government subsidy is accordingly justified. The drawback to a policy of full subsidization arises from the fact that fiscal constraints limit provision of the service to a fraction of the population, while not only does the majority not enjoy the private benefits (of, for example, vaccination) but also the production of public benefits is considerably less than what it might be (large areas remain contaminated by disease).

Partial cost recovery in such circumstances would permit an increase in both public and private benefits.

The reductio ad absurdum of a no-charge policy is found in cases where the beneficiaries are prepared to pay even more than full cost (e.g., the householder with a direct water connection), but cannot be served because the activity of the relevant agency--in this case the water supply company--is limited by the amount of its budget appropriation from the government.

In general, the provision of completely free services in the Sahel is justified only for the poorest of the poor. Free services for the whole community may be justified on social grounds in rich countries, but its application in the Sahel reduces the benefit which the population could derive from development efforts currently underway in the region.

The possibility is also open to the Sahelian countries of charging privileged consumers--portions of the urban populations and residents of the most accessible regions--in proportion to their income. "Privileged" refers here not only to high nominal income but also purchasing power, taking into account, for example, a consumer's access to foodstuffs at subsidized prices. For example, the sphere of secondary and higher education, where all students currently enjoy free tuition plus, in public service academies, liberal subsistence allowances irrespective of family income, may offer scope for introducing cost recovery measures.

In the health sector, where marginal cost pricing appears to be possible in primary health care, it would be unrealistic to expect direct cost recovery for treatment of serious diseases, hospitalization and medical evacuation, although once again for persons of high income and purchasing power this is not out of the question. One possibility would be to include part of the population in a medical insurance system

that would in turn stimulate demand for health care above the primary level.

Finally, cost recovery in agricultural projects in the Sahel is constrained by the existence of depressed producer price ceilings whose main object is to subsidize the urban population. Cost recovery in this sector depends on modifying the domestic terms of trade (ratio of a price index for agricultural commodities to an index for other goods and services) in a direction favorable to the farmers. As mentioned previously, analysis of this politically sensitive issue is the mandate of a different CILSS/Club du Sahel working group.

XIII. 5 Macro instruments and measures

In Part Three of the report, and especially Chapters XI and XII, it was suggested that the long-run solution to the problem of recurrent cost financing lies in the introduction of a set of policies designed to expand the Sahelian countries' tax base by accelerating the growth of output. The Working Group's foreign consultants are of the opinion that the thrust of these policies should be towards enhancement of incentives to private producers in agriculture, livestock, and other sectors of primary production, relaxing of bureaucratic restrictions on private investment, a diminution of the role of state-owned enterprises in sectors other than those constituting natural monopolies (telecommunications, water, electricity, etc.), and restructuring of the capital market to provide adequate real returns to savers while redirecting credit towards small and medium-scale producers currently exluded de facto from the organized credit market, where the prevalence of low and even negative (in real terms) interest rates has brought about a system of rationing available funds.

Implementation of such proposals should lead at the same time to a reduction of claims on budget resources which too often arise, at the present time, from the obligation to provide public sector employment to

all graduates, or at least the large majority of them, as well as to finance operating deficits of state enterprises.

It is not, of course, solely or even primarily for the sake of resolving the recurrent cost problem that such fundamental changes should be undertaken in current policies. But insofar as the Working Group's foreign consultants believe that the solution to the macro problem of recurrent costs, whose manifestations have been illustrated at length, is inseparable from an increase in the rate of economic growth, it would be dishonest on their part not mention the obstacles, which, in their view, impede attainment of more rapid growth.

The context of the present report does not provide scope for a detailed review of alternative strategies open to the Sahelian countries with regard to production, investment, exports and imports. The Working Group can only recommend continuation and expansion of the macro economic dialogue initiated several years ago between the CILLS-member countries and Sahelian and non-Sahelian experts in connection with discussion of cereals policies in the Sahel.

In regard to other aspects of national resource mobilization, the Working Group has examined the possibilities of increasing nominal tax rates and tax collection. Chapter XI's review of Sahelian country tax rates and procedures suggested that it would be difficult either to increase the existing rates or otherwise increase the tax revenue cofficients. For its part, the collection effort appears more or less normal in comparison with other countries, taking into account characteristics of the Sahelian economies. One or two of the Sahelian countries have nonetheless recently introduced tax reforms and simultaneously attempted to increase their collection capability; significant increases in tax receipts followed, and the possiblity is not excluded that other countries

in the region could do likewise.

Finally, although it lay somewhat outside its mandate, the Working Group looked briefly at a question raised by a number of donors, as to whether the development strategy adopted for the Sahel in 1977, having been prepared immediately following a natural catastrophe with dramatic human consequences, might have neglected the most financially profitable sectors, from the government's viewpoint, in favor of programs designed primarily to improve the living conditions and satisfaction of basic needs of the rural population. The telecommunications sector was mentioned in this connection.

Our brief investigation into the matter suggests that, notwithstanding the donors' general insistence on projects aimed at the satisfaction of basic needs, opportunities for financially profitable public investments have rarely been ignored by Sahelian planners, and foreign capital, whether on concessionary terms or otherwise, has been obtained without notable difficulty for such activities. Indeed, the danger appears to run more in the direction of over-capitalizing such activities with high-technology equipment promoted by foreign suppliers.

Specifically with regard to the telecommunications sector, several Sahelian countries already channel receipts from telephone and telegraph services, which easily lend themselves to monopoly pricing (i.e., full-cost pricing plus a scarcity rent), into covering the deficits of related activities, notably the postal service, subject to particularly high-cost operation in the Sahel due to long distances and poor road communications. On the other hand, in the Sahel the government remains the most important consumer of telecommunications services--generally accounting for around 40% of total demand, and its account with the P & T authority is usually

in arrears, so that appropriation by the Treasury of any telecommunications surplus would be a matter merely of putting back in one pocket what had been taken out of the other, without creating a net surplus for the administration as a whole. Once more, it seems to us that, insofar as there are opportunities for financially profitable investment in the Sahel, it is up to the private sector to realize them and the resulting surplus should be tapped via the tax route.

Chapter Fourteen: INTERNATIONAL AID AGENCIES: AID POLICIES AND MEASURES AND ACTION CRITERIA FOR RECURRENT COST FINANCING

XIV: 1 Introduction

Assuming that the international aid agencies accept at least part of the diagnosis of the "recurrent cost problem" in the Sahel provided in parts Two and Three of this report, a wide range of alternative responses is open to them.

At one extreme the donors could offer the Sahelian countries general budget support equivalent to the ex ante fiscal deficits projected in Part Three of the report, adding up to about U.S. $180 million (1979 prices) in 1982. However, it would be naive to think that such a response would cause the recurrent cost "problem" to simply disappear.

International development cooperation is a complex web of interconnections and feedbacks, such that the ex ante deficit depends not only on the volume and type of aid provided in the past, but also on the recipient countries' perception as to the maximum amount of aid they might be able to obtain in the foreseeable future. Should the donors' response to the Working Group's diagnosis take the form of a declaration of intent to provide general budget suport of U.S. $180 million in 1982 and subsequent years, the likely result would be a series of new departures on the part of the Sahelian governments pointing toward still more ambitious state interventions in the economy. As a result, sooner or later a new working group would submit to the CILSS and Club de Sahel an updated projection of government expenditure and receipts yielding a still larger ex ante deficit, and thus the process would continue indefinitely.

A second possible donor response, diametrically opposed to the first, would be to consider that the internal policy measures discussed

in the preceding chapter should be quite sufficient to cover the projected deficit, and that accordingly there is no reason for the donors to modify their present modes of activity.

Should the recipient countries fall back on an analogous argument vis-a-vis the donors, namely that they were already doing everything possible to limit their expenditures and increase their receipts, and that it was therefore up to the donors to fill the gap with U.S. $180 million of additional aid in 1982, one can predict that many of the problems highlighted in Parts Two and Three would merely be aggravated.

It is the Working Group's impression, based on consultation of its members with representatives of both the Sahelian governments and donor agencies, that both sides appreciate that resolution of the recurrent cost problem requires a joint effort implying changes, in some cases significant, in existing modus operandi.

XIV: 2 Foreign aid and aggravation of the recurrent cost problem

Approaches to the donors to help solve the recurrent cost problem in the Sahel may take either or both of two forms:

i. draw the donors' attention to certain current practices which tend to aggravate the recurrent cost problem; or

ii. propose an increase in public development assistance or redirect it via new mechanisms.

The present section is devoted to an examination of the first point, the second being the object of the following sections.

Donor practices which currently tend to aggravate the recurrent cost problem in the Sahel relate both to the design and execution of projects, as well as the implementation of phases subsequent to project establishment.

In presenting the following list of practices the Working Group is aware that the situation is by no means uniform among donors, some of whom have long recognized the problems identified and undertaken to improve their procedures accordingly. Donors can also justifiably point out that certain of the practices occur as much in response to pressure from officials and agencies in host countries as out of the donors' own biases or pressures from interests back home. But in the scope of its investigation the Working Group found considerable scope for improvement in the areas cited below, with important potential benefits by way of reducing the recurrent cost burden.

1. Practices related to project design execution

Under this heading, the Working Group identified three sub-categories of irritants or problem areas attributable at least in part to donor policies and actions: utilization of inappropriate technologies, raising of factor prices, and implementation of projects on an inappropriate scale.

Utilization of inappropriate technologies. One of the education projects studied involved school buildings poorly adapted to the local environment--for example, the ventilation system, designed in accordance with the donor's standards for tropical rather than Sahelian conditions, allowed frequent sandstorms to disrupt classroom operation and augment maintenance requirements.

Excessive direct involvement by donor personnel in local activity during project establishment is another manifestation of "inappropriate technology." The Working Group was informed of a donor which, in its legitimate desire to see "its" operation "succeed," had its own highly qualified personnel intervene directly in a primary health care program. The community involved thus benefited from a higher level of care than

that enjoyed by neighboring communities, but the project has no assurance of financial viability after the donor's withdrawal.[1]

Finally, project appraisal reports prepared under donor supervision rarely include alternatives for operation and maintenance of the capacity to be installed with a view to minimizing the financial burden on the recipient government's budget once the facilities have been established.

Impact of donor activity on factor prices. In general, the donors appear to be little concerned about the cumulative impact of the projects they are financing on the level of utilization of scarce factors in the recipient countries (skilled and semi-skilled manpower, capital, foreign exchange). At the present time in the Sahel the economic or opportunity cost of a new project, per unit of domestic resources that it absorbs, exceeds that of the last preceding project. This situation, to which economists refer in talking about the increasing marginal social cost of projects, manifests itself in a number of ways. A profusion of projects within a particular region--irrigation schemes, roads, etc.--makes it no longer possible, at the going wage, to recruit sufficient local manpower to ensure proper maintenance of the physical structures (in such cases, to ask the local population to take charge of the maintenance on a voluntary basis, as is sometimes suggested, is an illusory solution).

In other cases, two or more donors compete to obtain the best available local manpower as counterparts in the projects they are supporting. A frequent result of this competition is that the counterparts end up receiving, from the donors, salaries (including fringe benefits) which exceed those paid by the public service in the recipient country for individuals with similar qualifications.

[1] We, of course, have nothing a priori against the fact that a given community should receive better care than the nationwide average, indeed quite the contrary. The problem arising here is that of how to justify for the country as a whole the corresponding net increase in costs in relation to the benefits obtained.

A number of Sahelian governments have complained about this situation, which raises delicate problems when the staff in question is reintegrated into the public service on the donor's departure, giving rise to tensions between the authorities and the individuals in question. Acceding to the demands of the latter leads to a general increase of the national recurrent budget. There is no intention here to condemn the donors' practice, which merely reflects the oepration of market forces. It is rather a question of highlighting the fact that each new project implemented in the Sahel leads to certain cost increases which must be justified carefully on the basis of a comparison with the benefits generated by the same project. If there ever was a time when what was demanded of the recipient Sahelian countries in terms of their counterpart contribution could be considered as having zero cost for the country in question, that time has certainly passed.

Inappropriate project scale. Instances are reported where donors, responding to pressure groups in their own bureaucracies or societies at large, have promoted activities in the Sahel on a larger scale than was warranted by the state of knowledge about the costs and benefits of the project strategies employed. Clearly, almost any activity will have supporters in certain segments of the local bureaucracy, whose strategy for expansion or merely survival is to play off the donors against the central planning and budget authorities of the recipient government. For good or bad, donor influence on many projects and programs now under way in the Sahel is a fact of life.

2. Practices relating to the post-project phase

Four issues will be raised under this heading.

Inadequate attention to post-project budget planning. In the last analysis it is, of course, the recipient's responsibility to conduct forward budget planning such that it avoids committing itself vis-a-vis a donor to sustain projects that are likely to enjoy low priority in post-implementation budget allocations. At the same time, given the substantial bargaining power that a donor enjoys in local resource allocation decisions by virtue of its financial contribution, it cannot entirely escape responsibility for anticipating the recipient's priorities and making its own judgments as to a project's likely fate in future budget scrambles. One donor freely admitted to a transgression in financing a teacher training institution in a Sahelian country, the demands of whose operation and maintenance so burdened the host government's budget that the latter was forced to shut down two similar functioning establishments in order to meet its commitment. Other cases were reported where the donor agency and its consultants had studied the budget implications of projects they were evaluating without consulting the host government's planning and budget authorities.[1]

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[1]See above, Chapter XIII, Section XIII.3, Subsection 1.

Under-estimation of time required for project execution.

Part Two of the report mentions the problem of under-estimation of the period of experimentation and implementation of many projects, particularly in the agricultural sector. The fault is not entirely the donor's but it shares responsibility: in general, donors program their commitments over periods that have little relation to the time actually required to establish the project they are assisting (up to 15 years). The governments' operating budgets thus inherit situations at the time of the donor's withdrawal, where the expenditures to be financed have nothing to do with normal operation. It is true that the frequent practice whereby the original or a different donor picks up successive phases of an activity as separate projects, resolves the problem, at least partially, from a financial viewpoint, even if it does not necessarily address the basic issue involved.

Some donors employ internal project planning documents that envisage more realistic implementation periods, well in excess of their statutory limits on the duration of binding aid commitments. Donor representatives maintained to the Working Group that these limits, unavoidable in the light of vagaries in international economic and political relations, conveyed the advantage of forcing both sides to undertake thorough-going evaluations of project performance while in no way barring continued donor involvement as desirable to promote project objectives.

Failure to provide technical facilities for project follow-up.

In the case of road construction and maintenance, the Working Group's attention was called to the fact that the donor frequently lacks, or

does not put at the recipient's disposal, information concerning the capacity of foreign suppliers of construction and maintenance equipment to ensure after-sales services and resupply of spare parts. This may lead to long periods of equipment down-time, increasing recurrent costs associated with under-utilization of the material.

Volatility of donor development strategies. Inasmuch as donor agencies do not have to bear the direct social and political costs of project suspension and deterioration of infrastructure in recipient countries, they are apt to modify their aid practices in accordance with the shifting winds of development philosophy and North-South relations: satisfaction of basic needs versus growth, search for intermediate technologies versus transfer of modern technology, etc. (In at least one of the donor countries one could find these different concepts of development being defended actively by different segments of the government majority in 1979.) The impact of this phenomenon is difficult to evaluate, but we cannot avoid noting the uncertainty it may create on the part of recipient governments whose interest in the matter is that donor commitments should be as firm as possible and apply to long periods of time.

XIV.3 Alternatives for donor action

Apart from measures which the donors may or may not take to modify operating practices and procedures that aggravate the recurrent cost problem as outlined in the preceding section, the positive alternatives they face can be grouped under two headings:

i. whether or not to increase total aid flows;

ii. regardless of the volume of aid flows, whether to retain the status quo or make changes in procedures and mechanisms of aid transfer, such as shifting funds from one vehicle to another (e.g., replacing a portion of project aid with sectoral budget support, commodity assistance, etc.)

Members of the Working Group strongly support the principle of greater resource transfer from rich to developing countries, and favor measures that would reduce the immense gap now separating living standards of inhabitants of the rich countries from those of the Sahelian population. At the same time it is not the Working Group's place to advise the donors on the relative merits of competing claims on their resources--i.e., social returns from transferring resources to the Sahel versus investing them in international capital markets, aiding poor countries as opposed to helping underprivileged groups at home or even simply leaving the resources in the hands of the taxpayers. The Working Group therefore abstains from a formal recommendation to the donors asking them to increase their total volume of aid to the Sahel or to any individual Sahelian country in particular.

On the other hand, the Working Group does regard as part of its mandate to consider alternative procedures and vehicles of assistance to the Sahel by which the donors could help to alleviate the recurrent cost burden identified in this report even without increasing total financial assistance. In the context of a fixed overall aid ceiling it is important to examine with the greatest possible care the opportunity cost of moving towards new mechanisms and procedures of aid transfer.

Under the heading of alternatives for donor action we will consider two categories of measures: i. improvements in programming of project expenditure, and ii. reallocation of part of existing project development aid to more flexible vehicles such as sectoral budget support and project recurrent cost financing.

XIV.4. Improvements in programming of project expenditure

Few of the measures considered with respect to the Sahelian countries[1] can be implemented without active donor support, given the latter's dominant role in guiding and financing project preparation as well as supervising its execution. This begins with the flow of information. Donor agencies often have more direct access to information concerning project operation and maintenance requirements than host country agencies, particularly those not directly involved in project implementation, which category unfortunately includes, among others, the host country budget authorities. There is a simple reason for this--it is most frequently consultants on contract to or at least financed by the donor agencies who are responsible for estimating project O&M requirements.

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[1] See above, Chapter XIII.

It is open to a donor to bring to the attention of the host country planning and budget authorities, in a regular and systematic manner, any information in its possession concerning recurrent expenditure implications of projects in which it is involved. It is suggested that this should be done at least once a year, early enough so that the relevant information can be taken into account in the host country's budget. The information presented should cover three categories of projects: those already in operation, those in the process of implementation, and planned future projects in whose design the donor agency is playing a role. Each year's submission should incorporate any significant revisions in O&M expenditure requirements arising from changes in the implementation patterns as projected in the preceding year. The expenditure estimates should be presented in such a way that the host country authorities can easily relate them to standard local budget classifications.

It should be stressed that all such information provided by the donors would be purely advisory in character and in this regard would imply absolutely no obligation on the part of the host countries to take specific budget action on the information supplied. Finally, the annual submission could lead to fruitful consultations by way of providing the host governments and donor agencies with a regular occasion to acquaint each other with their respective priorities and interests in regard to allocation of development resources.

No less important is donor support for the other measures mentioned in Chapter XIII's Section XIII.3 in connection with improvement of expenditure programming: application of an accounting price for uncommitted government revenue, design of projects to take more

explicit account of uncertainties and information gaps, and regular performance evaluation leading, if necessary, to project rescaling.

XIV.5. Reallocation among aid vehicles

> Aid reallocation consists of transferring part of the resources available for a given vehicle of aid transfer to a different vehicle.

We envisage here two possible approaches to reallocation of public development assistance:

i. increased finance of local investment costs (Section XIV.6);

ii. increased non-project aid (Section XIV.7), notably sectoral budget support (XIV.8) and explicit financing of recurrent costs (XIV.9).

The base mode of financing, reallocations from which will be considered below, is project aid defined as public development assistance for non-recurrent expenditures of specific projects. The sectoral and project analysis in Part Two of the report has suggested that a number of projects are currently being carried out on a scale that is not compatible with our knowledge of the technical and socio-economic requirements for their success. Rescaling of such projects could thus lead to a reallocation of some current project aid to other more flexible modes of transfer whose

contribution to increased host country welfare would seem to be greater, at least under present circumstances. Such a procedure would also have the advantage of not bringing with it a reduction in total public development assistance, as one might think at first mention of rescaling.

XIV.6 Financing local investment costs

In no Sahelian country do donor disbursements account for less than two-thirds of total public sector development expenditure, covered by the national budget or outside it. In some countries the donor's share in development expenditure exceeds 90 per cent.

Nevertheless, in most countries there remains a modicum of development expenditure that must be covered by local residents. According to information obtained by the Working Group, the relevant amounts in 1978 were as shown in Table 14.1.

Local investment costs comprise either the host country's contribution to projects receiving external foreign aid ("the counterpart contribution to investment"), or capital expenditures which do not contribute to development as such according to established development doctrine--national defense, external affairs, and general government administration.[1]

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[1]It is important here not to confuse the term "local contribution to investment" with "local currency costs." The local contribution normally includes a certain amount of expenditure in foreign exchange.

TABLE 14.1

Local public investment expenditures of Sahelian Countries (1978)

	Cape Verde	The Gambia	Mali	Mauri-tania	Niger	Senegal	Upper Volta (a)	Total
		millions of dalasis	billions of FM	millions of ouguiyas	billions of F. CFA			U.S. $ equivalent
Exchange rates (b)		2.08=$1	451=$1	46.2=$1	226=$1			
Local Currency	0	21.4	3.4	570	14.8	13.2	3.0	--
U.S. $ Equivalent	0	10.3	7.5	12.3	65.5	58.4	13.2	167.2

NOTES:

a) Figure for Senegal refers to fiscal year 1977/78; for Upper Volta to 1977.

b) Average exchange rates prevailing during 1978 according to International Financial Statistics.

With respect to the requirement for a minimum local contribution to investment costs, intended to demonstrate the host country's interest in carrying out the project or program concerned, the donors have recently relaxed their demands, especially for the Least Developed Countries.[1] Even where the requirement is retained, donors are customarily lenient in its interpretation, tolerating a generous valuation of contributions in kind such as land, or permitting a recipient to count another donor's contribution as investment counterpart.

Construction of office buildings and other capital expenses related to general government administration, notwithstanding their relative unattractiveness under traditional criteria of development assistance, nonetheless represent a claim on government resources diminishing their capacity to meet other requirements, including operation and maintenance of development projects. If donors accept the desirability of freeing local budget resources for enhanced recurrent cost financing, some may find assuming a portion of the capital budget of government administration the least cumbersome alternative.

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[1] According to the World Bank definition, all countries in the Sahel except Senegal.

XIV.7. Non-project aid

This heading groups all forms of assistance that do not fit the definition of project aid, which refers to the financing of development or non-recurrent expenditures of projects. Non-project aid thus encompasses technical assistance, general balance of payments support, general and sectoral budget support, commodity aid in the form of consumer goods and intermediate inputs, and finally, direct financing of recurrent costs (even though such financing may be associated with one or more specific projects).

It will be recalled that goods financed under commodity aid are frequently sold by the government on the local market, the sales proceeds becoming a local counterpart contribution to project development expenditures in local currency. Under these conditions commodity assistance is indistinguishable from project aid, regardless of the initial transfer mechanism employed. If, on the other hand, these proceeds are devoted to financing project operation and maintenance costs, the commodity aid is tantamount to explicit recurrent cost financing.

Non-project aid has been and remains an important vehicle of resource transfer to the Sahel. As shown in Table 14.2, however, in the case of four of the five major DAC-member donors to the region, accounting for 89 per cent of 1978 commitments, the proportion of non-project assistance in each one's total aid to the Sahel during 1975-1978 was lower than in its worldwide aid commitments during 1978.

Sectoral budget support and direct recurrent cost financing appear to be the principal avenues open to donors who may be prepared

TABLE 14.2

Proportion of non-project aid in total public development assistance

(in percentages)[1]

Countries /Institutions	To all developing countries (1978)	To the Sahel (1978)
I. DAC-member countries (89% of PDA to the Sahel)		
Canada	49.8	22.0[2]
France	73.2	76.0 (FAC)[3]
Germany	57.9	30.0
Netherlands	49.4	16.5
United States	74.4 (1977)	49.0[2]
II. Multilateral institutions except those associated with OPEC and/or the Arab countries		
EEC		36.0 (EDF)
World Bank (and IDA)		0.0
African Development Bank/ African Development Fund		0.0
UN Agencies		30.0[2]
III. Institutions associated with OPEC and/or Arab Countries		
Islamic Development Bank		0.0
Arab Bank for African Development		0.0
OPEC Special Fund		72.0 (1976-78)[4]
Arab fund for Economic and Social Development		0.0 (1976)
IV. Arab countries		
Saudi Arabia		54.0[5]
United Arab Emirates		42.6[6] (est.)
Iraq		54.0[4] (est.)
Kuwait		0.0 (est.)

[1] In the case of donor governments, denominators used to calculate the proportions comprise total bilateral assistance and exclude contributions to multilateral institutions.

[2] Mainly food aid

[3] Of which 47.0 per cent comprises technical assistance

[4] Balance of payments support

[5] Budget support to Mauritania

[6] Emergency assistance

to increase the share of non-project assistance in their resource transfer to the Sahel, under either a constant or augmented aid ceiling.

XIV.8 Sectoral budget support

Under this heading a donor would commit itself to reimburse, over a given period of years, a certain portion of a country's total current budget for a particular sector or set of activities within a sector, irrespective of the previous financing of the development expenditures that brought the activities into being. This vehicle of aid transfer is distinguished from explicit or direct recurrent cost financing of development projects, which refers to specific projects whose development phase benefited from foreign assistance.

The education section of Chapter VIII called attention to the nature of most recurrent expenditure in that sector, and doubly that of operation and maintenance of teacher training institutions, as constituting investment in human capital formation. Of all the sectors that might be candidates for sectoral budget support, education would thus seem to be potentially the most attractive to donors willing to use this aid vehicle. Such assistance could make an appreciable dent on the rate of expansion of primary and secondary school enrollment, which Chapter VIII showed to be a painfully slow process in the Sahel.

A problem arises with respect to the duration of such financial assistance. No aid agency, bilateral or multilateral, can make commitments binding its successor administrations throughout their terms of office. Hence, a Sahelian country that relied on sectoral budget support for education would find itself in the position of hiring and training teachers and building schools with no guarantee of being able to retain the teachers or operate the schools for more than, say, five years. On the other hand, the Sahelian

government might reason that the probability of qualifying for future tranches of sectoral budget aid covering, for example, subsequent five-year periods was sufficient to take the risk, considering the immense education requirements facing it.

The Working Group is aware that aid agencies have traditionally shied away from sectoral budget support, in part out of aversion to the political consequences of trying at some future time to extricate themselves from an open-ended commitment of this sort. At the same time the donors have accepted on various occasions that the Sahel's precarious economic situation justifies a search for new modalities of cooperation, involving explicit recognition of the lengthiness and complexity of the development process under such conditions. It is on this basis that the Working Group entertains the hope that the donors will consider with open minds a recommendation in favor of sectoral budget support for education in the Sahel, as an efficient and flexible vehicle for aid transfer.

XIV. Explicit financing of recurrent costs

This is clearly the most direct possible donor response to the recurrent cost problem, but as we have shown, it is by no means the only one. Nor is it necessarily the optimal solution. A few Sahelian budget officials indicated to the Working Group their fear that annual donor reimbursement of O & M costs of individual projects would impose a heavy administrative burden by requiring them to allocate to specific activities, on the basis of documentation acceptable to a donor, individual expenditure items funded under sector-or subsector-wide appropriation categories (the staff payroll, materials and supplies, etc.). It would also be a mistake to underestimate the tensions which can arise from attempts by donors and recipients to mesh their expenditure control procedures, which must in no case be confused with the exchange of information referred to in Section XIV. 4 above (such tensions have already arisen in the past in connection with control of recurrent-type expenditures during the project implementation phase).

None of this, to be sure, constitutes an absolute bar to explicit donor financing of recurrent costs, but it constitutes a cost to be taken into account in ascertaining the net advantages of departures in aid practice.

As indicated in Chapter II, since 1977 the OECD's Development Assistance Committee has looked closely at explicit financing of project recurrent costs as a possible mode of aid transfer to all developing countries, not exclusively the Sahel. In 1978 it conducted a survey of its members' policies or intentions in this area. The results of this survey, updated by more recent information collected by the Working Group, are summarized in Table 14.3. Examination of the table indicates that most donors are in principle reluctant to finance recurrent costs directly, although several of them consider that they are doing it de facto when they give aid for deferred maintenance or current expenditures during establishment which they consider, incorrectly in our view, as being recurrent. The definitions which we propose in Chapter II, illustrated by applications in Part Two of the report, should provide the DAC members with a theoretical and operational basis enabling them henceforward to determine whether they are, in fact, financing recurrent costs directly or doing something else instead such as, for example, financing current costs of project establishment (or what might be called "pseudo-recurrent"costs).

In apparent contrast to their a priori reluctance, the DAC members resolved in a communique of May, 1977 that they would:

> provide recurrent cost financing according to the merits of individual cases, taking into account such factors as:
>
> 1. the overall domestic financing capacity of the country, giving especially favourable consideration to requests from least developed and other countries with low domestic financing capacity;
>
> 2. the nature and degree of the constraints faced by the recipient country in meeting recurrent costs from domestic resources for the project/programme under consideration; the financing of recurrent costs should, in particular, be used to support

TABLE 14.3

Attitude of certain DAC members to explicit financing of recurrent costs

DAC members (Incomplete)	Basic position (if known)	Exceptions to basic position	Examples
Australia			Has provided, to a Southern Hemisphere country, general budget support amounting to 40% of the country's total budget revenue.
Belgium	Reluctant	Social sector projects in the Least Developed Countries.	Contrary to its initial intention, was obliged in '77 to finance recurrent operating costs for rural water supply project in an East Africa country.
Canada			Finances road maintenance in the Sahel.
E.E.C.	Excludes current expenses of administration, operation and maintenance (Lome I and II). Ready to consider on an exceptional basis, giving priority to least-developed ACP countries, temporary financing on a declining scale of operation, maintenance and management expenses of earlier investments, notably by providing maintenance inputs and executing major repairs (Lome II).[2]		
France[3]			In the case of countries belonging to the Franc Zone, makes little distinction between local and foreign exchange costs. Runs a major program of technical assistance in the Sahel.
Germany	Reluctant	Ready to consider certain costs of management personnel and finance of an initial stock of imported inputs and spare parts.	

TABLE 14.3 (cont'd)

Great Britain[4]	Concerned over the absence of objective criteria for financing recurrent costs, while acknowledging having financed them.	Ready to finance recurrent costs where this will promote the attainment of social objectives (employment)	
Japan	Not favorable		
Netherlands	Ready to consider financing certain local costs beyond the initial aid.		
Sweden			Receptivity to financing recurrent costs appears to diminish in proportion to the degree of its participatic in financing local costs.
United States	Reluctant	Ready to consider limited recurrent cost financing on a declining scale in the case of the Least Developed Countries.[5]	

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1 Principal source: unpublished DAC survey, 1978.

2 Direct communication from EDF to the Working Group.

3 The Caisse Central de Coopération Economique, in a note submitted to the DAC and communicated to the Working Group stresses that it finances: i. O & M costs of agricultural production projects, in cases of a particularly lengthy gap between investment and the first harvest ii. costs of extension and professional training iii. projects regarded as auxiliary to investments (health services for population involved in rural development projects, installation of maintenance facilities for complex installations, etc.)

4 See interview with Mrs. Judith Hart, UK Minister for Overseas Development (Overseas Development Institute Review), 1978, 1, p.6.

5 Communication to General Secretariat, United Nations Commission for Trade and Development.

projects of real social or economic worth which normally, at least at the outset, do not generate sufficient receipts to cover these costs;

3. the contribution of the project/programme under consideration to the effective use of local human and material resources and to the recipient's economic and social development;

4. the jointly-assessed ability of the recipient to take on increasing shares of the recurrent costs of the projects/programmes under consideration over time, recognizing that it is not appropriate for either recipients or donors to prolong external recurrent cost financing over too long a period.[1]

Logically, one would have to suppose that it is only the impossibility facing the Sahelian countries to satisfy criterion (4)--"the jointly-assessed ability of the recipient to take on increasing shares of the recurrent costs"-- that has prevented the DAC-member donors from financing a larger share of recurrent costs of projects in the Sahel, inasmuch as the Sahelian countries appear to satisfy quite fully the other three criteria. Criteria (1) ("countries with low domestic financing capacity") applies to the six of the eight Sahelian countries which the United Nations classifies as least developed, with the possible exception of Niger with its uranium revenues. With respect to criterion (2), the only illustration given of the "nature" and "the degree of the constraints faced by the recient country in meeting recurrent costs" is the existence of projects "which normally, at least at the outset, do not generate sufficient receipts to cover these costs." Actually, as we have already seen, this is the case w th the majority of projects in most sectors in the Sahel and it applies almost by definition to social sector projects (education, health). Finally, since all donors already apply some version of criterion (3) in selecting projects for financing, and most Sahelian projects receive external financing, this criterion is again satisfied almost by definition.

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[1] O.E.C.D., Presse/A (79) 21, Paris, 3 May 1979, pp. 5-6 (reproduced in O.E.C.D.: Development Cooperation: 1979 Review, Paris, November 1979.)

The DAC statement does not make clear what a developing country should do with a project that fails to satisfy criterion (4), i.e., the country cannot satisfy some donor as to its capacity to assume an increasing share of recurrent costs. According to the DAC, the project would seem to be doomed. What is more, it is unlikely that any donor would want to provide project aid to a country most of whose projects do not satisfy criterion (4).

Instead, one supposes that criterion (4) expresses the donors' reluctance, reflected in Table 14.3, to engage in explicit financing of recurrent costs, which is considered not only an open-ended commitment but also a vehicle of transfer that tends to diminish the host countries' interest in, and capacity to operate and maintain, projects whose implementation was financed by the international community. The following additional section of the DAC Guidelines lends credence to this interpretation:

> In accordance with the basic principle of long term self reliance and in order to preserve the recipient's commitment to particular aid projects/programmes, DAC Members, in cases where they decide to participate in recurrent cost financing, will provide such financing for specified time periods with agreements for gradual takeover by the recipient.[1]

The DAC criteria do not perhaps make as explicit as they might the difficulty that would face any donor in trying to evaluate a request for financing of the recurrent costs of a particular project or program in isolation, that is without reference to the other activities which the donor is assisting in the country, nor the overall objectives of its aid program there. Most major donors program their annual activities

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[1] Emphasis supplied by Working Group rapporteurs.

in a country on the basis of an aid ceiling or quota whose exact amount is unofficial and often held confidential. Donors' country quotas undergo continuous revision in accordance, on the one hand, with changes in the international scene and, on the other hand, departures from forecast project implementation timetables, but they remain nevertheless an important tool of aid programming. Each country aid quota encompasses a different combination of vehicles and procedures of resource transfer in accordance with the peculiarities of the activities in which the donor is interested and the nature of the manpower and material resources it can provide.

If a donor decides in principle to include direct recurrent cost financing in its arsenal of aid vehicles, the logical procedure to follow before applying it in a particular country would be to predict its net outcome on the pattern of activities in the country, compared with alternative aid packages not including recurrent cost financing. For example, if activity A consists of financing the implementation of a major agricultural project that is largely experimental in nature, while alternative B consists of reallocating part of the funds in question to maintenance of school buildings, it is up to the donor to examine, in conjunction with host country authorities and taking into account other donors' activities, which course of action would most advance the country's welfare.

The one sector for which several donors have decided that direct financing of recurrent costs, albeit somewhat disguised, is the best way of ensuring adequate operation and maintenance, is that of road infrastructure. Several reasons were put forward in Chapter VII to explain this situation, including the high internal rate of return of road maintenance activity, as well as its substantial content in donor country-supplied inputs (notably equipment).

> Apart from the case of road infrastructure, it can be stated that, in general, the donors have not yet engaged in explicit recurrent cost financing of programs and projects in the Sahel as defined in Chapter II of this report.

If, in the circumstances of a particular Sahelian country, it is concluded that reallocating part of current aid for project investment costs to direct recurrent cost financing would enhance efficiency in use of foreign and domestic resources, it is reasonable to consider ways and means by which the

donors will be able to limit their involvement.

One possible approach is to link the recurrent cost financing to the type of equipment installed under the initial project. For example, public works authorities in several Sahelian countries have suggested that each road construction project should provide for, say, five annual payments following the investment phase, covering purchase of spare parts for equipment supplied under the project. These payments would be equivalent to a certain percentage of the equipment value. In the present case 20 percent was mentioned as an annual ratio of operation and maintenance to purchase costs of equipment. In such a situation, the donor would have no difficulty in terminating its involvement five years after the terminal year of project implementation.

In case a donor is willing to provide recurrent cost financing other than as an extension to equipment financing during the latter's expected economic life, other possibilities for disengagement are open to it. It can, for example, program a transfer of resources on a declining scale, with a specific termination point.

Such an approach may appear simple in principle, but its application is not always so easy.[1] One donor cited an instance where it had agreed to finance O & M costs on a declining scale for a project whose establishment it had financed and to which it was providing technical assistance. Meanwhile, however, the government's fiscal position became extremely tight, and the institution's appropriation was reduced, thereby preventing the latter from fulfilling its commitments vis-a-vis the donor with regard to financing of operation and maintenance. The donor finally agreed to make up the difference.

Some observers have suggested as an alternative approach that donors make their financing of recurrent costs conditional on the recipient's efforts in the direction of cost recovery via imposing user charges, taxes or other measures. The proposal embodies the paradox that, the weaker the cost recovery

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[1] It should be noted that any form of aid which is constant in nominal terms declines in real terms under conditions of inflation.

effort, the greater the project's recurrent cost problem and hence the more needed is the donor's assistance. However an individual donor may react in such a situation, the international community as a whole will sooner or later be pressed to come up with something.

XIV. 10 A final vehicle of financial assistance: donor support for internal policy reforms

Considering the importance we give to internal policy reforms as a point of departure for a long-run solution to the recurrent cost problem in the Sahel[1], it would be a major oversight not to emphasize the donors' potential role in helping to minimize the adjustment costs which such reforms would impose on the countries of the region.

The adjustment costs that would follow from a greater decentralization, reliance on price incentives (verité des prix), etc., could be so severe in the short run as to raise the specter of socio-political tensions. A substantial program of consumer subsidies which the international community would commit itself to finance for a period of, say, five years, could make the reforms not only feasible but even attractive to the countries of the Sahel.

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[1] See above, Part Three and Chapter XIII.

PART FIVE

RECOMMENDATIONS

Chapter Fifteen: RECOMMENDATIONS TO THE SAHELIAN GOVERNMENTS, INTERNATIONAL FINANCE AGENCIES, CILSS, AND THE CLUB DU SAHEL

> The recommendations listed here should be understood as general principles that do not necessarily apply in each case to every single Sahelian country or individual donor. The countries are at different stages with regard to implementation of measures for recurrent cost recovery in the different socio-economic sectors. For their part the donors follow different policies in providing aid and their position with regard to financing of recurrent costs is not uniform.

A. Expansion of the real tax base

1. The Working Group emphasizes that the long-run solution to the recurrent cost problem must come via expansion of the Sahelian countries' real tax base concomitant with economic growth (Part Three).

Recommendations as to precise measures facilitating the attainment of this objective--relating to the respective roles of the state and private sectors, the adequacy of agricultural prices, the tendency of the public sector to appropriate a predominant share of capital and skilled manpower resources, pricing of capital and foreign exchange, adaptation of the tax system to each economy's particular structure, as well as policies toward foreign investment -- fall largely outside the Working Group's mandate. However, the Group recommends that the CILSS and Club du Sahel promote further collaborative research by Sahelian and non-Sahelian experts in the interest of achieving better understanding of the macro and sectoral impact of alternative measures on the different countries of the region.

B. Procedures of project preparation and execution

2. The Working Group recommends adoption, in future project planning in the Sahel, of its proposed definition of recurrent and nonrecurrent costs/expenditure, the recurrent cost and cost recovery coefficients, and modes of application of these definitions (pp. 18 - 37).

3. Consistent with the report's definitions and on the basis of its review, in particular, of development projects in the agriculture, livestock, forestry and health sectors in the Sahel, the Working Group recommends that both Sahelian and donor planners lengthen their time horizon for project planning so that the planned establishment period covers the number of years required for projects to complete their implementation phase. It recommends that all expenses associated with project establishment, whether current or capital, should be considered as nonrecurrent and eligible for international financing, depending on the recipient's particular fiscal situation (pp. 81-82).

4. In relation to point 3, the Working Group recommends that Sahelian planners and international finance agencies make a particular effort to distinguish, in project documents, the period necessary for technical, socio-economic and administrative trials from the project implementation period as such, so as to be able to relate the scale of projects to the different phases of their implementation (pp.81-82).

5. Given severe constraints on uncommitted budget resources of the Sahelian governments, the Working Group recommends that project costs whose financing depends on such receipts be adjusted, in the course of project evaluation studies, by a weighting coefficient (accounting price) exceeding 1.0. This procedure will make it possible to take explicit account of the fact that local budget resources carry an economic cost (or opportunity cost) greater than their financial cost (pp.278-82).

6. The Working Group recommends that both Sahelian government project analysts and international finance agencies take explicitly into consideration the rising marginal cost of local resources allocated to projects (infrastructure, skilled and semi-skilled manpower) (pp. 294-5).

7. The Working Group recommends that project designers and appraisers should consider explicitly alternatives for project operation and maintenance in terms of different possible combinations of factors of production and relative roles of the state and private sectors (pp. 277-8).

8. The Working Group recommends that , in estimating recurrent costs for purposes of project appraisal, evaluators should adjust the gross rental value of public sector maintenance equipment to include an estimate of underutilization cost, if applicable (pp. 136-7).

9. The Working Group recommends that, in the case of donor-financed projects utilizing foreign equipment, the aid agencies should supply full information to the host government concerning the capacity of the suppliers of this equipment to provide after-sales service as well as furnishing spare parts. In addition, it is recommended that even if the existence of such capacity is guaranteed, aid agencies should use their communications network and contacts to ensure that Sahelian users of the equipment can communicate as easily and efficiently as possible with the firms in question. Finally, the donors are urged to pursue their efforts to provide funds and technical assistance for maintaining this equipment (pp. 297-8).

10. The Working Group recommends that Sahelian planning and budget authorities arrange for donor agencies to communicate to them all information in the agencies' possession concerning the implications, for the recurrent budget, of past, present, and future projects, as well as any revision in corresponding projections due to changes in project execution. Furthermore, it is recommended that this information be submitted annually to the Sahelian Finance and Planning Ministries in a form compatible with standard expenditure classifications in the respective countries, and that this also set the stage for an exchange of views between the parties concerning their respective priorities as well as the problems raised by implementation and operation of the projects in question. The Working Group considers it highly desirable that a unit in the finance and/or planning ministry of each country, whatever its particular administrative status, should take responsibility for collecting the relevant information. Finally, it is recommended that technical assistance be provided to the Sahelian countries to help them ensure regular, efficient collection of data as well as to assist in all aspects of programming and budgeting recurrent costs (pp. 300-02).

11. The Working Group recommends that the donors pursue their efforts to eliminate those aid practices which tend to aggravate the recurrent cost problem (utilization of inappropriate technologies, inappropriate scale of projects, lack of attention to budget programming of projects' subsequent phases, etc.) and to minimize their participation in financing sectoral activities to which the host countries assign low priority (pp. 292-8).

C. Specific measures designed to increase the effectiveness of recurrent expenditures and cost recovery

The Working Group recommends that certain measures be considered with a view to reducing recurrent costs, e.g.:

12. Transfer responsibility for certain maintenance functions in connection with rural water supply installations to departmental and community authorities (p.90).

13. Re-examine the levels of student subsistence payments, which in some cases appear high in relation to instruction costs (p.178).

14. The Working Group recognizes the importance of price policies offering suitable incentives to producers. At the same time, it does not consider it within its mandate to make specific recommendations concerning the corresponding measures of macro policy (see point 1 above) and leaves it to the CILSS/Club du Sahel Working Group concerned with cereals policy to look specifically at issues of pricing and distribution of food grains (pp. 75-6).

15. The Working Group recommends application in some sectors of the principle of user payment of marginal cost. This applies to animal health services and primary health care. The Group does not, however, recommend that costs of administrative personnel should be imposed on users in these sectors (excepting the marginal cost of field personnel, i.e., village health workers and vaccinators) (pp. 110-14 & 194-5).

16. The Working Group recommends the principle of charging full cost for public services to users of higher income and purchasing power. This applies to secondary health care where the recovery mechanism might be establishment of a medical insurance system limited to a segment of the population. It also applies in some countries to consumers of water from rural boreholes distributed by direct connections (pp. 206 & 88).

17. In the field of tax policy the Working Group recommends consideration of the following alternatives:

i. to increase revenues earmarked for road maintenance by shifting the fuel tax from a specific to an ad valorem rate differentiated according to final use (p. 246n).

ii. to increase revenues allocated to the financing of primary education (extending the system of parents' associations responsible for collecting matriculation fees, taxation of real estate, etc.) (p. 186).

More generally, the Working Group recommends that the Sahelian governments improve the state of information on potential sources of tax revenue, endeavor to better adapt the tax system to the structures of the respective economies, and review on a regional level the tax and other benefits associated with the national investment codes (pp. 248-50).

D. Donor contribution

The Working Group calls attention once again to the content of recommendations numbers 2 through 11, which apply simultaneously to donors and recipient countries.

18. Whatever may be the rate of increase of total aid to the Sahel in the future, the Working Group considers that reallocating part of the aid allocated for projects to local investment costs of public administration and/or non-project aid, would (1) relieve the pressure on local budget resources, (2) permit direct financing of recurrent costs, (3) reduce current

expenditure claims, or (4) permit a combination of any two or more of the above.

19. Under the heading of non-project assistance, the Working Group recommends that the donors consider seriously two possible measures:

i. sectoral budget assistance specifically for the education and health sectors (pp. 309-11).

ii. increased direct recurrent cost financing for certain activities, by mutual agreement between donor and recipients, whose operation between now and 1984 is jeopardized by the possibility of inadequate financing (pp. 311-17).

20. Concerning Point (ii), it is recommended that the Sahelian countries join with the donors to find means of assuring the latter that such commitments will be limited in time (pp. 317-18).

21. The Working Group recommends consideration of the possible creation of a fund to support macroeconomic policy reforms by the Sahelian countries (p. 319).

APPENDIX C: List of participants at donors' meeting on recurrent cost financing

(University of Montreal, March 27-28, 1980)

I. Bilateral Organizations

Belgium	:	M. L. de Josez (A.G.C.D.)
Canada	:	Messrs. G. Saint-Martin, M. Messier and J.P. Bolduc (CIDA)
France	:	Messrs. J. Bathany (FAC) and P. Bénédic (C.C.C.E.)
Switzerland	:	Mr. R. Grossenbacher (Swiss Embassy, Washington)

II. Multilateral Organizations

World Bank	:	Ms. K. Larrecq
European Development Fund	:	Mr. R. Brenner
International Monetary Fund	:	Dr. P. Heller
O.E.C.D.	:	Mr. F. Livingston (DAC)

III. CILSS executive secretariat (observers)

Messrs. S. Traoré and L. Ranger
Miss J. Sorgho

IV. Club du Sahel secretariat

Messrs. G. Bourgoignie (chairman) and A. Fell

V. Consultants

H.I.I.D.	:	Mr. C. Gray and Ms. F. Bove and C. Jones
C.R.D.E.	:	Messrs. A. Martens and J. Kessous

APPENDIX A: List of members of the Working Group on Recurrent Costs

I. National delegates to the study

Cape Verde Islands: Mr. E. Pinto (Ministère du Plan)

The Gambia : Mr. D.T. Davies (Ministry of Finance and Trade)

Mali : Mr. B. Diallo (Ministère des Finances)

Mauritania : Messrs. Ould Cheickh Bounena and Bakha Sidi Mohamed (Ministère de l'Economie et des Finances)

Niger : Mr. A. Rhousmane (Ministère du Plan)

Senegal : Messrs. A. Sow and M. Diouf (Ministère des Finances)

II. Representatives of the CILSS executive secretariat

Messrs. Y. Idrissa and S. Traoré

III. Representative of the Club du Sahel

Mr. G. Bourgoignie

IV. Members of the CILSS executive secretariat

Miss Jeanne Sorgho
Messrs. M. Keita
L. Ranger
V. Stagliano

V. Representatives of international finance agencies
(doesn't include additional persons who participated in March 1980 donors' meeting at Montreal -- see Appendix C.)

France : Madame F. Duriez, Messrs. Ph. Bénédic, and J. Nénert (C.C.C.E.) and J. Bathany (F.A.C.)
United States : Messrs. M. Golden, J. Mudge and J. Smith (USAID)

World Bank : Ms. K. Larrecq and Mr. L. de Azcarate

VI. Sahelian consultants

Messrs. B. Bah (Bureau Africain de echerches Appliquées - Mali), W. Boukari (Ecole Nationale d'Administration, Niger), M. Diouf (Ministère des Finances - Senegal), S. Fye (Ministry of Local Government - The Gambia), S. Ould Salek (Ministère du Plan et des Finances - Mauritania), N. Sankaré (Institut de productivité et de gestion prévisionelle - Mali), T. Thiombiano (Université de Ouagadougou - Upper Volta), A. Zongo (Ministère du Plan et de la Coopération - Upper Volta).

VII. Non-Sahelian consultants

France	:	Messrs. M.O. Bosshardt, J.M. Funel, J.P. Lemelle (SEDES), O. Richet (CCCE) and P. Thénevin (FAC)
Switzerland	:	Mr. B.A. Jenny (International Foundation for Development Alternatives)
HIID	:	Prof. Monique Garrity, Messrs. E. Berg, P. Bloch, A. Daniere, C. Gray (assisted by F. Bove and C. Jones), J. Haughton, G. Lemoine, M. McPherson, M. Over, P. Salin, R. Schneider, C. Shoup, D. Stryker, W. van Rijckeghem.
CRDE	:	Messrs. A. De Montigny, N. Essama, O. Hawrylyshyn, A. Martens (assisted by J. Kessous), F. Mattart, E. Siggel, A. Sy.

VIII. Additional participants in the June 1980 Working Group meeting in Ouagadougou to approve the final report.

Club du Sahel	:	Mme. A. de Lattre
EEC	:	Mr. R. Brenner
France	:	Messrs. M. Pénent and Y. Jorlin (CCCE)
Niger	:	Mr. N.A. Tankari (Ministère des Finances)
Senegal	:	Mr. A.D. Niane (Ministère du Plan et de la Coopération)

APPENDIX B: Technical reports submitted to the Working Group on Recurrent Costs

(all studies were carried out between late 1978 and early 1980)

Categories /Titles	Author(s)	Institution	Available in original language (O) and translation (T)	
			French	English
I. Studies of development projects (see also sectoral studies)				
A. Chad				
Etude des charges récurrentes de l'opération de développement rural intégré en zone sud de la République du Tchad	Thénevin P.	FAC	O	
B. Mali				
Charges récurrentes dans l'Opération Arachide et Cultures Vivrières	Bah B.	BARA	O	
Le cas de l'Opération Développement de l'élévage dans la région de Mopti	Bah B.	BARA	O	
The School of Medicine, Dentistry and Pharmacy in Mali: Case Study of Recurrent Cost Implications	Haughton J.	H.I.I.D.	T	O
Opération pêche Mopti: An Investigation of Recurrent Costs	Haughton J.	H.I.I.D.	T	O
Les coûts d'entretien de la surface aménagée rizicole de l'Office du Niger au Mali	Martens A. with Sorgho J. and J. Kessous	CRDE/CILSS	O	
On-Farm Cattle Fattening in Mali: A Case Study for the Sahel Recurrent Cost Study	Stryker D.	H.I.I.D.	T	O
C. Niger				
Reprise des écoles et CEG	Daniere A.	H.I.I.D.	O	
Les dépenses récurrentes du Plan céréalier national et de la protection des cultures au Niger	Essama N. Sy A.	H.I.I.D./C.R.D.E. C.R.D.E.	O	

APPENDIX B (Cont'd)

	Author(s)	Institution	Available in original language (O) and translation (T)	
C. Niger(cont'd)			French	English
Etude des charges récurrentes des aménagements hydro-agricoles au Niger: analyse des principaux résultats économiques	Funel J.M. Lemelle J.P.	FAC/SEDES	O	
Maradi Rural Development Project	Schneider R.	H.I.I.D.	T	O
D. Senegal				
Le cas du projet Sine-Saloum au Sénégal	Bénédic Ph. and Bosshardt M.O.	C.C.C.E./SEDES	O	
Etude des opérations de développement: le secteur de la pêche au Sénégal (motorisation des pirogues)	De Montigny A.	C.R.D.E.	O	
Coûts récurrents des ouvrages d'hydraulique rurale au Sénégal	Diouf M.	Ministry of Finance, Senegal	O	
Recurrent Costs of Village Water Supply Projects in Senegal	Diouf M. and Garrity M.	Ministry of Finance, Senegal H.I.I.D.	T	O
Bakel Small Irrigated Perimeters	Schneider R.	H.I.I.D.	T	O
Recurrent Cost Issues of Sédhiou Rural Development Program	Schneider R.	H.I.I.D.	T	O
Livestock Development in the Sylvo-Pastoral Zone of Senegal	Stryker D.	H.I.I.D.	T	O
E. Upper Volta				
Projets d'investissement, coûts récurrents et rendement apparent de l'éducation rurale (formation de jeunes agriculteurs) en Haute-Volta	Daniere A.	H.I.I.D.	O	
Les coûts récurrents d'une installation en culture sèche, de 15 000 familles sur les terres neuves aménagées par l'Autorité des aménagements des Voltas	Richet O. and Sorgho J.	C.C.C.E./ CILSS	O	
Sector Report I (West Volta Agricultural Development Project)	Schneider R.	H.I.I.D.	T	O
Sector Report II (Rural Development Fund)	Schneider R.	H.I.I.D.	T	O

APPENDIX B (Cont'd)

Categories and Titles	Authors	Institution	Available in original language (O) and translation (T)	
			French	English
II. Sectoral Studies				
A. Agriculture				
Summary of Recurrent Cost Issues Raised by Five Project Case Studies	Schneider R.	H.I.I.D.		O
B. Livestock				
Recurrent Costs of Animal Health Services: Mali, Mauritania, Senegal and Upper Volta	Stryker D.	H.I.I.D.	T	O
Livestock Development and the Role of Government	Stryker D.	H.I.I.D.	T	O
C. Forestry				
Recurrent Costs of Forestry Projects in Mali and Upper Volta	Jenny B.A. with Sorgho J.	Swiss Development Cooperation/CILSS	O	T
D. Transport infrastructure				
Les charges récurrentes de l'infrastructure routière des pays du Sahel	Martens A. with Sorgho J. and Kessous J.	C.R.D.E./CILSS	O	
E. Education				
L'éducation dans les pays sahéliens	Daniere A.	H.I.I.D.	O	
F. Health				
Five Primary Health Care Projects in the Sahel	Over M.	H.I.I.D.	T	O
III. Country studies				
Cape Verde Country Report	Van Rijckeghem W.	H.I.I.D.	T	O
An Analysis of the Recurrent Cost Problem in The Gambia	McPherson M.	H.I.I.D.		O
Le financement des coûts récurrents des investissements du Mali	Salin P. and Haughton J.	H.I.I.D.	O	

APPENDIX B (Cont'd)

Categories/Titles	Author(s)	Institution	Available in original language (O) and translation (T)	
			French	English
(Country Studies cont'd)				
L'équation budgétaire mauritanienne	Mattart F.	C.R.D.E.	O	
Analyse globale budgétaire des dépenses récurrentes du gouvernement central du Niger	Hawrylyshyn O.	C.R.D.E.	T	O
Rapport sur le financement des coûts récurrents des investissements publics au Sénégal	Garrity M. with Bove F.	H.I.I.D.	O	
La situation financière du Gouvernement de la Haute Volta face aux coûts récurrents des projets de développement	Siggel E.	C.R.D.E.	O	
IV. Miscellaneous studies				
Public Sector Salaries in the Sahel	Berg E.	H.I.I.D.	T	O
A Qualitative Assessment of Seven of the Sahel Countries' Tax Systems	Shoup C.	H.I.I.D.	T	O
V. Working documents				
Guidelines for study of development projects	Martens A. (rapporteur)	C.R.D.E.	O	T
Guidelines for Study of National Fiscal Balance	Gray C.	H.I.I.D.	T	O
Recurrent Costs of Development Projects in the Sahel: the November 1979 Stage	Gray C. and Martens A.	H.I.I.D./C.R.D.E.	O	T

APPENDIX D: Numerical illustration of applications of accounting price for uncommitted government revenue

We assume three alternative opportunities for immediate investment (realization assumed to occur at time zero or January 1 of the first year) of one billion francs CFA of foreign aid resources, each having an economic lifetime of ten years and each involving equal annual streams (annuities) of net benefits and, where relevant, government recurrent expenditure, both of which are realized on December 31st of the first and succeeding years. Net benefits and recurrent expenditure are stated below in constant prices as at January 1 of the first year.

The projects differ as follows:

I. Project A generates a stream of net social benefits equal to F.CFA 250 million, accruing to members of society at large (i.e., not the government). Its operation and maintenance either involve no recurrent government expenditure at all, or else the project generates in each year net additional government receipts, whether directly or at higher levels of the production and distribution chain, exactly equal to government expenditures on operation and maintenance, so that the net burden on the government's recurrent budget remains zero.

II. Project B generates a stream of social benefits, net of all social costs except those corresponding to government recurrent expenditure, equal to F.CFA 500 million. Its operation and maintenance impose an annual recurrent expenditure burden, net of incremental government receipts generated directly or indirectly by the project, equal to F.CFA 200 million.

III. Project C generates a stream of net social benefits equal to F.CFA 200 million, realized in the form of a net annual contribution of F.CFA 200 million to the government Treasury (i.e., receipts generated directly or indirectly by the project exceed government recurrent expenditure on its operation and maintenance by F.CFA 200 million.)

The present value of each project's net benefits is given by a standard formula, i.e. that representing the present value of an annuity, $\frac{1 - (1+d)^{-t}}{d}$, t being the duration of the annuity or project, here equal to ten years, and d being the discount rate, which we will assume here to equal 0.10 or 10%, the whole expression being multiplied times the constant annual amount of benefits. Interest tables show us that $\frac{1 - (1.10)^{-10}}{.10} = 6.145$. Each project's total net present value, subtracting the cost of the investment, is then given by 6.145 times net benefits minus F.CFA one billion.

Allowing no premium over the nominal value of uncommitted government revenue, which amounts to assigning it an accounting price of 1.0, we obtain the following net present values for the three projects:

Project A: 6.145 X F.CFA 250 million - F.CFA 1 billion =
F.CFA 536 million

Project B: 6.145 X F.CFA 300 million (= 500-200) - F.CFA 1 billion
= F.CFA 844 million

Project C: 6.145 X F.CFA 200 million - F.CFA 1 billion =
F.CFA 229 million

Clearly Project B is the preferred alternative, while C gives the least return of the three.

Now we assume a severe budget crunch, such that the Treasury is forced to ration available revenues among public sector claimants, the result being that a significant amount of public sector capital operates below capacity. Using the example cited in the text, vaccination teams are forced to sit idle at dispensary or health ministry headquarters due to lack of fuel to send them into the countryside. Segments of irrigation schemes are closed down for want of funds to maintain the canals. Lack of maintenance likewise causes

roads to become impassable, or at the very least users incur a high cost on account of vehicle wear and tear.

In sum, the situation is such that an additional unit of government revenue allocated to any of these uses would bring an incremental return greater than the marginal return to operation and maintenance expenditure that was anticipated at the time the capacity in question was created. This is because the additional revenue brings into operation capacity that otherwise has to lie idle, whereas the respective project plans assumed that revenue would be available to operate all this capacity at an economic level, and that additional expenditure would make the difference only between operation at economic capacity and operation at a slightly more intensive level.

We assume that the government's planners, viewing the situation from a perspective that covers the whole public sector, estimate that the average unit of additional government revenue, by activating otherwise idle capacity, will create a net benefit equivalent to 1.50 times its amount (nominal value), i.e., an additional million francs CFA of revenue will generate F.CFA 1.5 million of social benefits. This implies an accounting price of 1.5 for uncommitted government revenue, tantamount to an opportunity cost of F.CFA 1.5 for each franc of domestic revenue expended and not recovered in establishing and operating a new investment project.

The calculus for the three projects then changes as follows:

Project A--no net government expenditure or revenue generation assumed, hence no change in calculation of NPV, which remains F.CFA 536 million.

Project B--the net recurrent expenditure burden of F.CFA 200 million now translates into a social cost of F.CFA 300 million (200 X 1.5), reducing the annual net benefit from F.CFA 300 million to 200 million, giving an NPV of F.CFA 229 million.

Project C--the F.CFA 200 million worth of net revenue generated by the project now has a social value of F.CFA 300 million, raising its annual net benefit by F.CFA 100 million to a level of F.CFA 300 million, giving a new social NPV of F.CFA 844 million.

Thus, use of an accounting price for uncommitted government revenue reverses the ranking of the three projects, making C the most beneficial and B the least beneficial.

The same procedure could of course be repeated using alternative values of the accounting price--e.g. 1.7 or 2.0--in connection with a broader sensitivity analysis.