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A LOOK AT FOUR ROADS

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TABLE OF CONTENTS

I. Background: the Problem of Infrastructure and Interpretation

II. Legislative History: the New Mandate and Its Interpretation

III. A Look at the Four Roads

Mali: Economic Background

Kayes-Nioro Road

Bamako-Bougouni Road

Moundou Guidjiba Road

Fort Foureau-Fotokol Road

IV. Conclusions

This paper looks at four proposed AID road projects in Western Africa. They are:

1) Kayes-Nioro Road (Mali)

2) Bamako-Bougouni (Mali)

3) Moundou Guidjiba Road (Chad) and

4) Ft. Foureau-Fotokol (Cameroon), previously Maiduguri-N'Djamena Road

All but one of these has been turned down either by Congress not approving the necessary funds or by postponing/cancelling the Preliminary Identification Document (PID) Review. To some old timers at AID, these roads appear to be "old dogs". Their names are familiar, but the issues surrounding them grow hazy.

These four roads are examined to determine why the particular course of action was taken concerning them. The reasons may be economic, political or legal. The legal aspects are compared with the spirit of the Foreign Assistance Act of 1973, sometimes referred to as the "Congressional Mandate" or the "New Directions".

Background:

Problem of Infrastructure and Interpretation

The lack of adequate rural infrastructure is a major constraint to Sahelian development. Where infrastructure exists, much of it is rudimentary and in poor condition due to inadequate maintenance. Ninety-three per cent of the secondary and feeder roads (which comprise 72% of the 80,000 kilometer road network in the Sahel) are in poor condition (See table 1).

This poor condition of the road network was the major impediment to the transportation of drought relief supplies. It currently contributes to the relative isolation of rural areas, and as such, is a serious constraint to rural development and agricultural marketing. This in turn has caused the transport costs to rise.

Construction of infrastructure represents only 3% of GDP compared to 8 to 12 % in more active developing countries. The slow rate of infrastructure development is exacerbated by the shortage of budget funds, engineers, planners, skilled workers and middle level management personnel. Road maintenance has suffered due to the same reason. Deterioration of the existing raods has resulted due to lack of regular upkeep and repair. This contributes further to the lack of infrastructure.

An adequate transport network is essential for just about every aspect of rural development. The distribution of basic goods and services is restricted, produce cannot be marketed, and even basic services such as health care and medical supplies are impeded.

While transport is necessary for economic growth, it is not by itself sufficient. Complementary investments or circumstances are required. Access alone will not guarantee exogenous development.

The OECD Conference on Rural Road Transport Planning (December, 1977) recommended that roads should be built around a comprehensive package of investments including social, health and agricultural inputs, and that they should be measured within broader social and economic criteria. The World Bank summarizes this view in a post project evaluation as the best rural roads being the ones which give animation to the self-initiative of agriculture producers.

Legislative History : the New Mandate and Its Interpretation

The Foreign Assistance Act of 1973 (The "Congressional Mandate") stipulated "Future United States bilateral support for development should focus on critical problems in those functional sectors which effect the lives of the majority of the people in the developing countries" and that "...development assistance should give the highest priority to undertakings submitted by host governments which directly improve the lives of the poorest of their people and their capacity to participate in the development of their countries."

It continues to say that "priorities should be directly related to meeting the basic human needs of the poorest people ... in order to enhance their opportunities for employment, to improve the distribution of wealth and to increase social justice. Programs which aim at development through a "trickle down" approach should be left to multilateral international financial institutions and private investment."

The words "directly", "improve", "meeting", and "effect" are not precise and leave a tiny leeway in interpretation. Infrastructure projects are not ruled out as long as they can be shown to "directly" "improve" the lot of the rural poor. A thorough but generalized investigation of the long-term effects of infrastructure on the rural poor has not been performed. While infrastructure is necessary for the delivery of goods and services to the rural poor, it can also induce growth in agriculture and the economy in general. These results are hard to estimate beforehand.

In ensuing discussions, the Congress realized "...that in the long run, rural development and the establishment of infrastructure are necessary to

sustained improvement of food production and distribution" and that one should not "preclude the provision of United States projects which may be infrastructural in nature." 1/

A key component of AID's implementation policy of the Congressional Mandate became "to start immediately to assure the small farmer access to relevant physical and institutional infrastructure."

Section 103 of the "Report to the Committee on International Relations on Implementation of Legislative Reforms in the Foreign Assistance Act of 1973" interprets projects as acceptable which are: "Activities in support of rural production rather than simply agriculture, with the emphasis on linkages between agriculture, industry and marketing." This does not preclude allocation of funds to roads. The Report specifically warns against the "construing the necessities of national development too narrowly" and adds "this is especially true in Africa where basic infrastructure is most needed."

Further latitude for infrastructure projects in the Sahel is in The Report of the Committee on International Relations (No. 9S-240). It states that "the emphasis.... is away from United States financing of such /major/ infrastructure, and it was therefore deemed appropriate to enact ... special conditions for the Sahel Program. The special provisions are necessary because some major infrastructure projects ... are proposed for the Sahel in order to attain higher yields, provide some protection against erratic rainfall, and further the overall development of the region."

As a result of the emphasis on the Congressional Mandate or "New Directions", AID missions have shied away from infrastructure projects as they no longer

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1/ March 18, 1976· Foreign Related Programs - Appropriation Bill 76, page 44

seemed in vogue in Washington. Clarification of which infrastructure projects meet the intention of the Congressional Mandate is essential. The "New Directions" could conceivably result in a lack of direction regarding infrastructure.

Mali: Economic Background

Mali is a landlocked country bordered by seven other African countries. It is one of the most rural and agriculturally oriented countries in the world. The northern half lies within the Sahara Desert and is sparsely populated. Most of the people live in the country's southern half, 55% of them in the Savanna regions through which flow the Niger River and its tributary. The inhabitants of the Savanna are the most economically active and are engaged in food crops and animal husbandry.

Approximately 90% of Mali's population are in rural villages and engaged in agriculture, livestock production and fishing. While some people are involved in trade and in handicrafts, the majority of the remaining 10% of Mali's population work in servicing these primary industries by providing transport, processing, commercial and governmental services and account for 40% of the GDP.

Only two of the countries surrounding Mali provide connections to the Atlantic Ocean with sufficient capacity to handle Mali's needs. These would be sufficient only if both are used. Road transport accounts for 75% of all passenger traffic and 45% of all domestic freight traffic (with 40% of the freight traffic by rail).

In Mali, there is a road fund to which road users contribute through specific taxes in fuel and lubricants, ad valorem import duties on vehicles, equipment and spare parts and annual vehicle registration charges. The revenues from the fuel tax are deposited directly into a Road Fund, which is an independent account in a local bank. This finances road maintenance and construction activities as well as the overhead of the Public Works Department. This road fund is administered by the Director General of Public Works. Other road user taxes go into the general budget.

The IDA, in its analysis for its third highway project, found that the resources for normal maintenance of the existing transport network were rapidly approaching what could reasonably be set aside in the GOM's current budget as a recurrent appropriation. This is quite apart from the possibility of additional maintenance resulting from a further expansion of the road network. This, if further expansion of the road network is envisioned, extra revenue from fuel or other taxes is needed.

Kayes-Nioro Road

The PID for this project represents the transport sector priorities drawn from three previous efforts: The Sahel Access Roads, Mali First Region Feeder Roads, and First Region Integrated Development.

These previous efforts point to the importance of the construction of the Kayes-Nioro Road based on the following facts:

1) the historical emphasis on the Kayes-Bamako railroad has caused rural road development in the first region to be neglected;

2) the rural road deficiency has caused most modern development to take place along the railroad alignment which has been a detriment to the development of the interior, and

3) the construction of the Kayes-Nioro Road is a top priority of the Malian Government.

The proposed project is the construction of a 247 km. five meter wide rural access road between Kayes and Nioro. This construction will remove a major obstacle to the development of this area. The current road alignment is an unengineered track developed by local truckers to transport goods from Kayes, the regional rail heal, to the small herder and farmer population in the northern part of the First Region.

This road will be upgraded to reach Malian B_2 design standards which include all-weather surfacing and 5 meter traveled way with two meter shoulders. It will be surfaced with laterite. No massive cuts, fills, or drainage structures are considered. It will be designed to hold a 13 ton axle load, the standard design in Francaphone West Africa.

The costs have not been calculated in detail as the design team for this road is currently carrying out a detailed analysis for the Project Paper. The current estimates are based on the average per-kilometer costs of analogous road construction elsewhere in Mali and in AID Sahelian experience.

The total cost has been estimated at $8.7 million at December, 1975 prices. Adding contingency costs and anticipated inflation, the total disbursement is estimated at $14.1 million dollars.

Economic Justification

The benefit/cost ratio for this road was estimated as 1.3 for the entire alignment based on user cost savings. This excluded the value added of opening a new region and the resulting growth of agriculture and small businesses. The opportunity cost of capital was estimated as 10 percent.

The beneficiaries of the construction of the Kayes-Nioro Road are expected to be the low income rural herders and small farmers who are located within the boundaries of one of the following integrated development schemes: Operation Kaarta (rural development), Operation Lac Magui (crop and livestock development), and potentially Operation Kayes Nord Ilivestock).

The Canadian planning of Operation Kaarta assumed the Kayes-Nioro route would be funded by another donor. the Canadians are extremely interested in the Kayes-Nioro route as it is essential to their project, have commissioned at least two transport studies on the problem and have offered an agriculture economist to the U.S. design team.

The success of the other two projects funded by AID also depend on the construction of the Kayes Nioro Road. Access routes are essential for Operation Lac Magui, and Operation Kayes Nord must have access routes for its inputs as well as possible evenutal transport of calves from its zone. In addition, the AID Project,Mali Rural Health Development, will rely on access roads.

A second direct beneficiary will be the area transport industries, especially the government owned company and the small private truckers in Kayes and Nioro. Currently, the government regulated transport rates are not high enough to induce truckers to up country travel. The reduction in operating costs resulting from this project would encourage truckers to carry supplies to and agricultural produce from the ruural poor. It is estimated that at least 50% of the operating cost reduction will be passed on to the rural farmer in the form of lower transport costs.

Comments

This road seems to be somewhere in between a point to point road and a farm0to-market linkage. It connects two population centers, but is also integrally connected witn regional development projects.

While the Mandate clearly appears to approve road construction for farm-to-market linkages when the impact for the rural poor can be demonstrated, it clearly disapproves of the reconstruction or improvement of roads serving just to link up major population centers. In any case, it must be emphasized that the final rule of thumb on acceptance of any project is the degree of impact on the rural poor.

Of the 750,000 million inhabitants of the First Region, probably 37 percet (all of which fall into the category of poorest of the poor) are effectively cut off from the modern sector of the national economy. Most are engaged in subsistence agriculture and to a much less extent in commercial agriculture.

The city Nioro has a nomadic population with no modern infrastructure (no sewers, city water, engineered roads, modern buildings, or electricity; once a week radio-telephone service, a handful of automobiles and occasional small airplane flights to Bamako).

This road in conjucntion with the rural development, crop livestock and health projects is expected to have definite effect on improving the life of the rural poor.

Bamako-Bougouni (The Mali Highway Development Project)

Background

In 1967, the United Nations Development Program (UNDP) agreed to finance a needed transportation survey for Mali. Acting upon the recommendations of this survey, the World Bank provided highway equipment and the feasibility studies and detailed engineering design of the Bamako-Bougouni (GOM) requested AID assistance in September, 1972 in financing the rehabilitation of the Bamako-Bougouni Road. This was the oldest paved road in Mali and has deteriorated due to heavy traffic and inadequate maintenance.

In June, 1973 a loan agreement was signed between AID and the Malian Government for $9 million. Of this $1 million was retained for spare parts, $1-1/4 million for training and $6.7 million for resurfacing the 155 km. of the road connecting Bamako and Bougouni. Of this $6.7 million, $5.3 million was project in February, 1972 as the cost with $1.4 million allowed for cost overruns.1/

1/ Source Jim Graham, the project manager.

Project Description

The Mali Highway Development Project was a multi-donor effort to assist the GOM to reconstruct two major trunk roads and to improve the GOM capability to maintain its transport system. Specifically, this project consisted of engineering supervision during construction, continuation of IDA financed maintenance and feeder road improvement (including technical assistance) supply of detailed engineering for improvement and/or reconstruction of the 120 km road from Bamako to Kolokani.

The reconstruction work was to include rehabilitation of the existing structure (regravelling the shoulders, reshaping ditches, and repair and reconstruction of structures), widening the pavement to seven meters on the Bamako-Faladie-Senou section and to six meters on the balance of the road, strengthening of base and pavement where required, widening of several one lane bridges, and horizontal and vertical realignment where required for safety reasons.

The AID portion of this project consisted of the reconstruction of 155 km of the road running southeast from the capital of Bamako to the town of Bougoni and a grant of two million dollars of U.S. road maintenance equipment. Substantial parts of this road had to be rebuilt to modern standards. Bridges had to be built and road bridges strengthened.

The second road of this project, financed by the World Bank, runs northeast connecting Faladie and Segou (233 km). Faladie is a town 7 km south of Bamako which is serviced by the Bamako-Bougomi Road. Hence, the Bamako to Faladie section is common to both roads.

These two roads cover two major Malian land transport routes. The Bamako-Bougomi route serves the cultivated region to the south and formed part of an important international link with the Ivory Coast. Forty percent of Bamako's international traffic moved on this road.

The Bamako Segou section links Bamako to the cotton producing areas around Segou and comprises part of the only all-weather link with Mopti, the gateway to the Niger River Basin. It had become the life line between the port in Abidjan in the Ivory Coast and Bamako. The only other access to the Atlantic Ocean is a low capacity railroad to the port of Dakar in Senegal.

The Faladie-Bougoni section would also serve the new international airport at Senou, 10 km south of Bamako.

In January, 1974, a month before the bid documents were issued, drastic price increases occurred in the price of petroleum and related products. This unexpected increase greatly influenced construction costs worldwide since major construction items such as gaoline, diesel fuel, asphalt, cement, and steel are either petroleum by-products or require petroleum products. Transportation costs were equally affected by the petroleum costs.

In light of the resulting worldwide inflationary trends, the Malian Government requested consulting firm Louis Berger International, Inc. to review the cost estimates for the Bamako-Bougomi road in spring, 1974. Their estimate was $12 million, about double the engineering estimate of two years earlier.

This estimate would also be too low as it was erroneously based on the estimated unit costs of local firms already established in West Africa rather than U.S. firms with higher work standards (based on practices common to the US) and higher start up costs of transporting staff and materials to Mali the first

time. Two bids were received in the fall of 1974 - one for $25.7 million and $18.7 million. The second contract was negotiated and accepted for $16.7 million. This two million dollar reduction was made possible by an increase in mobilization payment to the contractor (thus reducing his need for borrowing) and a change in various construction and engineering techniques.

As the engineering costs were much higher than anticipated, there seemed to be four alternatives available to AID. 1) to cancel the entire project, 2) to authorize the additional $9.7 million for the loan but not to finance the $2 million in maintenance equipment and 3) to finance the maintenance equipment but not to reconstruct the road, and 4) to finance the entire road and the $2 million in maintenance equipment. All alternatives but the latter were deemed uneconomical. To build the road without furnishing the maintenance equipment would result in rapid deterioration of the road; the GOM does not have the needed foreign exchange to purchase the equipment. Failing to construct the road would result in the Bamako-Bougoni road deteriorating to an impassable condition.

Hence, the fourth option was pursued and early authorization was pushed to get the extra $9.7 million needed to construct the new road and to supply the maintenance equipment. The bid of $16,700,000 was only open until January, 1975 at which point it was expected to increase because of the high bids of the other contractors.

After providing the required Congressional notification, AID found there was considerable Congressional opposition to the proposed additional financing. Both the Senate and House Sub-Committees for Foreign Operations considered holding hearings on this proposed increase.

During this period, the low bidding contractor extended their bid validity date a second time to March, 1975. However, Congressional objections to the loan were not satisfied. As a result AID and the GOM agreed to reduce the project to the reconstruction of the approximately 15 kilometers of road between Bamako and the airport road and the repair of bridges. Further delays resulted, and costs skyrocketed to $500,000 per kilometer. In November, 1975, it was finally decided to remove all construction from consideration and provide financing for only maintenance equipment and spare parts with some technical assistance.

The initial rate of return was calculated at 24% at 37% for the Bamako-Faladie and Faladie-Bougoni sections respectively. The increased construction costs reduced to approximately 18%. While the costs increased, the user benefits also increased because the vehicle operating costs increase on unimproved roads with increases in fuel costs. This increase, however, was not as great as the escalation of construction costs.

Trucking organizations were many and ranged from large cooperatives to individual owners. Trucks accounting for 45% of the total traffic had an average loading capacity of between 6 and 10 tons and were generally used to collect produce in the rural areas. It was unclear how much of the reduction in their transport costs would be passed on to the producers and consumers.

Comments

The costs escalated up to approximately $500,000 per kilometer (in comparison to the $100,000/km for the World Bank Road).

The increase in costs over all previous engineering designs was attributable to three causes:

1) increased cost in petroleum related products

2) the consultants seriously underestimated the road construction costs

3) the two extra years of traffic caused further deterioration of this road. There was more traffic than expected because the Mono Bridge was closed for two years.

This was a point-to-point road and was conceived before the current Congressional Mandate. Rather than a mandate to reach the rural poor, the main consideration was then the project's interregional significance. This road satisfied the previous legislation but could not satisfy the Congressional Mandate of 1973. As such it was changed to equipment and maintenance support. Thi. road could not satisfy the new legislation and hence was turned down.

Moundou-Guidjiba Road

Description

The proposed Moundou-Guidjiba Road is 305 km. long connecting Moundou (Chad) and Guidjiba in the Cameroons. This road would provide the main link between Chad's southeastern cotton belt and the main north-south Cameroon road. This results in a decrease of the distance between Moundou and the Trans-Cameroons railhead at N'Doundere (Cameroons) by 35%. This would provide an international route to the Atlantic which would be preferable to alternative routes which are limited to seasonal use, frequent loadings and unloadings, port congestion, and foreign exchange difficulties.

Thirty-eight percent (116 kms.) of this road would be in Chad. The impact area for this road, as identified by the government, is four administrative regions in southeastern Chad. The areas are primarily agricultural with development efforts aimed toward food crop (millet, sorghum and rice) and commercial cotton production. The population density of these regions is 16 persons per km.^{2}, which makes it one of the more densely populated areas of Chad.

Chad is landlocked and is more than 1,700 km. by any transport corridor to any ocean port. Approximately 80% of this distance is transiting other countries. External transport is, therefore, important to the economy since the high cost of transport makes exports less competitive and imports more expensive.

There are four existing routes to the Atlantic. These are subject to seasonal and foreign exchange constraints. The proposed Moundou-Guidjiba Road will alleviate some of these problems.

This road would serve as route for international traffic. There is strong evidence to suggest that almost all import and export traffic for

southeast Chad will divert to this route. The main source of this traffic is due to cotton production and related industries (e.g., importation of fertilizers, agricultural, industrial and consumer goods, and the exportation of cotton fibre.

The detailed information on the technical characteristics of this road have not been presented by the Government of Chad. The proposed road is 6 meters wide, with an annual capacity of 500,000 tons of traffic. The upper weight limit permissible is 13 tons. Seventeen bridges are required on the Guidjiba-Chad border section in Cameroon; on the Moundou-Cameroon border section three 3.3 meter bridges and two 44 meter bridges are required.

The GOC anticipates the internal rate of return for this road to be 18%. This figure is subject to question as it includes administrative districts considered as impact areas for the proposed Bongor-Lai link. Thus, the possibility of double counting exists in this rate of return.

Costs

The FED financed technical and economic studies of the Moundou-Guidjiba Road in 1973-74. The cost at current prices is estimated at $56 million plus costs of contingencies, supervision and price revisions estimated at $18.8 million. The total cost, $75 million, is to be reduced by a waiver on contractor's taxes, to the neighborhood of $68 million.

The government has estimated annual maintenance costs at $2,166 per km. This figure excludes taxes, and includes regular annual maintenance and an application of a new wearing course every six years. This compares to the recent estimate of $3,968 per km. (1977 prices without taxes) in the Road Maintenance and Diagnostic Study in the Sahel, prepared by Louis Berger International, Inc.

In April, 1978, there was a donors meeting in order to solicit pledges for the Moundou-Guidjiba and Bongor-Lai routes. Together the World Bank, Saudi Development Fund, the Central African Development Bank, the Arab Bank for African Development and FED contributed $66 million out of the required $68 million needed.

A major consideration with regard to road projects in Chad is the maintenance costs. Maintenance operations in Chad have had a difficult time keeping up with the existing paved roads in the country. To combat this problem, the Chad Maintenance Project encouraged the Chadians to set up a road fund in order to fund maintenance operations. (For this project, which is an approved PP, AID has appropriated $9 million in coordination with the World Bank and the African Development Fund.) An AID official in N'Djamena cautioned that this project will absorb most of Chad's resources for maintenance leaving no resources for the maintenance of roads such as the Moundou-Guidjiba.

Political Considerations / Comments

The gap of $2 million needed out of $68 million provided a nice little piece if AID wished to participate as a minority member of a major multi-donor infrastructure project. This allows a presence while minimizing the U.S. technical and managerial role.

If AID's policy were to participate as a small member in large multi-donor projects, this project would have been ideal. The fact that this road was not pushed forward, shows that the Congressional Mandate has taken precedence over expedient political solutions. While it's possible that the decision to cancel the PID review for this road was due to anticipation of a clearer AID policy on infrastructure this fall, the overriding concern

appears to have the road's importance in international traffic which has not been shown to benefit the rural poor.

In fact, a view of the past shows that as cotton prices and revenues have improved, the percentage total income of the Chadian farmers per year has decreased. This is an indication that the benefits due to an increase in international traffic will not trickle down and not directly benefit the rural poor. (It is possible that these benefits might indirectly help the rural poor but this depends on how the other parts of the commercial system (the government, industries) use their increased revenues. This would require a detailed analysis of the Chadian governmental-institutional system.)

Hence it seems like AID's decision to cancel the Moundou-Guidjiba PID review indicates total conformance with the intent of the Congressional Mandate. Political expediencies did not outweigh the intent to "directly" "benefit" the rural poor.

Fort Foureau-Fotokol Road

Based on a 1967 Economic Commission of Africa survey of nine roads in the Chad Basin area, the Lake Chad Basin Commission (LCBC) requested the United States Government to undertake a detailed feasibility study of three links: Fort Lamy-Maiduguri, Kaele-Bongor and Bama-Maroua. The first two roads were found economically feasible by this study which was completed in October 1970. With a loan of $1 million, AID agreed to finance the engineering design of improving these two roads to two lane asphalt surface highways.

Nigeria had financed the design of the Nigerian section of the Fort Lamy-Maiduguri road (Maiduguri to Gambard) leaving the Foureau-Fotokol section for AID financing.

The Fort Foureau-Fotokol Road connects Fort Foureau (in the Cameroons) to Fotokol (also in the Cameroons). Approximately 102 km. long, it is the only transport link between these two cities. It begins at the ferry landing at Fort Foureau which is on the Cameroon side of the Chari River and runs northwest for about 64 km. then it turns directly west for another 38 km. to Fotokol. This is the principal route connecting Nigeria and Chad.

This route is considered extremely important to N'Djamena (formerly, Ft. Lamy) and its hinterland areas as it then constituted the primary arterial route for Chadian imports and exports which funneled through N'Djamena. This international route would also serve the sparsely populated Cameroonian region to the south of Lake Chad.

The Fort Foureau-Fotokol road was considered an essential element of one of the four main routes to the Atlantic Ocean. The Nigerian railroad runs from the ports of Lagos and Port Harcout to Maiduguri. This this route forms

a link in a long and major artery for importing and exporting goods for the Lake Chad Basin area.

Its width varying from 8 to 20 meters, this road is unpaved and relatively well maintained. It is in good shape during the dry season. During the rainy season it does not fare so well in spite of the fact that it is constructed on an embankment from 1 to 2 meters high and has dikes built on the sides. These dikes have not performed too well.

It was proposed to pave this two lane road to make it 8 meters wide (.8 of this is a shoulder on each side). The minimum design speed intended was 100 kilometers per hour.

The costs of construction for the 102 km. of the Fort Foureau-Fotokol Road were estimated as $4.3 million. Adding contingencies, engineering design and supervision, this amount increased to $5.8 million ($150-200,000 per kilometer). This was based on a 1970 study under the assumption the construction would commence in 1972. These figures are out of date, and, like the Bamako Bougouni construction estimates, have probably skyrocketed since these initial estimates.

The maintenance costs for this bituminous paved roadway were estimated at $1,005/km.

Economic Justification

The major economic activities of the Lake Chad Basin are concerned with the production of food crops (millet, sorghum, groundnuts, rice), cotton, and livestock. The processing of these products is represented by cotton gins, cotton seed and peanut oil extraction mills, livestock slaughter houses and a small amount of textile manufacturing. Commercial fishing is also a thriving industry. These goods could be transported out of the Lake Chad Basin by the proposed Fort Foureau-Fotokol Road.

By 1995 crop production for the area is expected to increase by nearly 60% without the road improvement and by 100% with the road improvement. The livestock was projected to grow by 13% with the road and to decrease without the road.

The benefit/costs were calculated as approximately 8% using user cost savings, maintenance savings, and value added by agricultural production (7.3% using low benefits and 8.8% using high benefits). The internal rate of return was approximately 8% whereas the opportunity cost for capital between 8 and 12%. If the entire road was built to Maiduguri, the IRR for the Fort Foureau-Fotokol section was in the range of 9 to 14%.

Comments

The Fort Foureau-Fotokol Road was marginal in its economic justification. (The internal rate of return was approximately equal to the opportunity cost of capital.) This road however was very important to the Government of Chad as it was a vital international link. This road was not considered so vital, however, to Cameroon in whose territory the entire road lay.

This road is clearly not in accordance with the intent of the Congressional Mandate of 1973. It's justification lay solely in the increased international traffic with little mention of the rural poor. AID had approved funding the engineering design of this road in 1972, before the new Congressional Mandate. AID's actions subsequent to Mandate were in keeping with the new legislation: no further action was taken.

Conclusion

Of these four roads, only the Kayes-Nioro Road is in accordance with the spirit of the Foreign Assistance Act of 1973. Even this road will be subject to debate as it has characteristics of a point to point road.

The other roads are international routes which were not yet justified on their effects on the rural poor. The Moundou-Guidjiba Road seemed to have the strongest justification as an international link. It would carry 80% of the cotton fibre exports in 1995 and provide a significant back haul of consumer products from overseas and the Cameroons. It would also provide savings costs to COTTONCHAD, which is partially owned by the Chad Government. Also in its favor, this road is a multi-donor effort in which the United States would provide less than 3% of the costs. However, this road has in effect been turned down by AID in spite of the political expediencies. It has not been shown to benefit the rural poor. To the contrary, the Chad Government's record does not indicate transferring the benefits to the rural poor.

It appears that the Bamako-Bougouni Road has the second highest justification of the international routes. Forty percent of Bamako's traffic is expected to move on this road. This road when originally passed was subject to different Congressional legislation, which required projects to be regional in nature. Due to serious underestimates in the construction costs and the rise in petroleum prices, this road was stalled until after passage of the New Directions Legislation and was not approved by Congress.

The Foureau-Fotokol Road is one whose economic justification was marginal. There was significant heavy truck traffic which would have benefitted. This road seems to be the least justifiable of the four roads.

These results are summarized on Table II.

The issue of what roads could and should be funded under the Congressional Mandate is difficult. While the Mandate clearly says that the rural poor should be directly benefitted, the definition of "directly" and "benefitted" are not precise.

The traditional approach using user cost savings is not readily applicable to situations where the current usage is low: the user savings will be low. What is important is the agricultural and commercial growth resulting from the road. Yet one must be careful in estimating who will obtain these benefits. Traditionally, the "better off" farmer and merchants have been in the best position to take advantage of the benefits of development schemes. In this case, one has to rely on the "trickle down" theory to reach the rural poor. This trickle down theory is thought to have little effect on the plight of the rural poor.

When it comes to helping the rural poor, implied is the opportunity for them to improve their food intake, health facilities and educational opportunities. Security in knowing the risks and uncertainties in these areas are reduced is important, too.

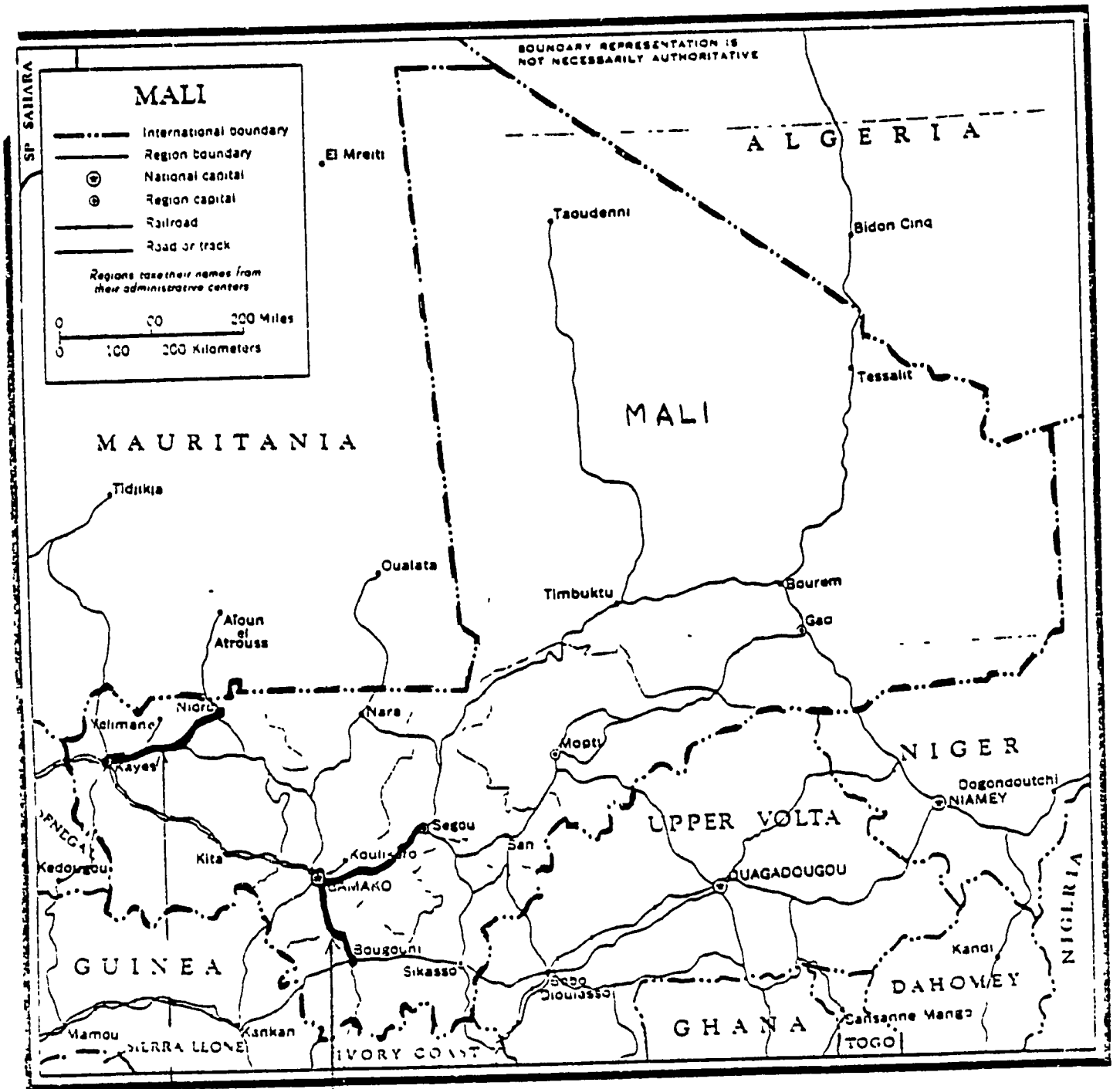
The economy, as a system, is as weak as its weakest link. When the roads serve as a weak link, or a bottleneck, in providing the above services, they are clearly authorized under the New Directions (e.g., Kayes-Nioro Road).

When a road is expected to open up a new region, it also should be allowable although the benefits to the rural poor might not be precisely definable. It cannot help but to provide opportunities to the people of the isolated region. In conjunction with this, an AID official mentioned how that with the deterioration of a main road in the Sahel, all the small commercial enterprises disappear. Although the induced benefits may not be quantifiable, opening up an isolated area should be encouraged. This is

commonly called the catalyst effect.

Other projects that are recommended in rural roads are those in which there is a high level of community involvement. I recall a World Bank consultant in Karachi who was working with the local people every day in planning their community. The inhabitants decided that they wanted their roads weaving around the local houses. With the local support of the residents such projects had a high probability of success in spite of the opinion of outside planners. The only thing I could add to this approach, would be that the people put something of their own in the project, even if it is a contribution of only a few pennies. With a stake in a project, it will be valued. (A possible suggestion would be to provide Peace Corps volunteers or perhaps a more professional kind of "volunteer" to work with the local people in such projects.)

Any of the above type of projects would keep fully with the intent of the New Directions.


MALI
International boundary
Region boundary
National capital
Region capital
Railroad
Road or track
Regions take their names from their administrative centers
0 50 200 Miles
0 100 200 Kilometers
BOUNDARY REPRESENTATION IS NOT NECESSARILY AUTHORITATIVE
SIP SAHARA
ALGERIA
El Mreiti
Taoudenni
Bidon Cinq
Tessalit
MALI
MAURITANIA
Tidjikja
Oualata
Timbuktu
Bourem
Gao
Afoun el Atrouss
Nioro
Yelimane
Nara
Mopti
NIGER
Kayes
Dogondoutchi
NIAMEY
UPPER VOLTA
Segou
San
Kita
Koulikoro
Kedougou
BAMAKO
OUAGADOUGOU
NIGERIA
Bougouni
Kandi
GUINEA
Sikasso
Bobo Dioulasso
DAHOMEY
GHANA
Mamou
Kankan
Cansanne Mango
SIERRA LEONE
IVORY COAST
TOGO
Base 39310 3-64
KAYES-NIORO ROAD
BAMAKO-BOUGOUNI ROAD

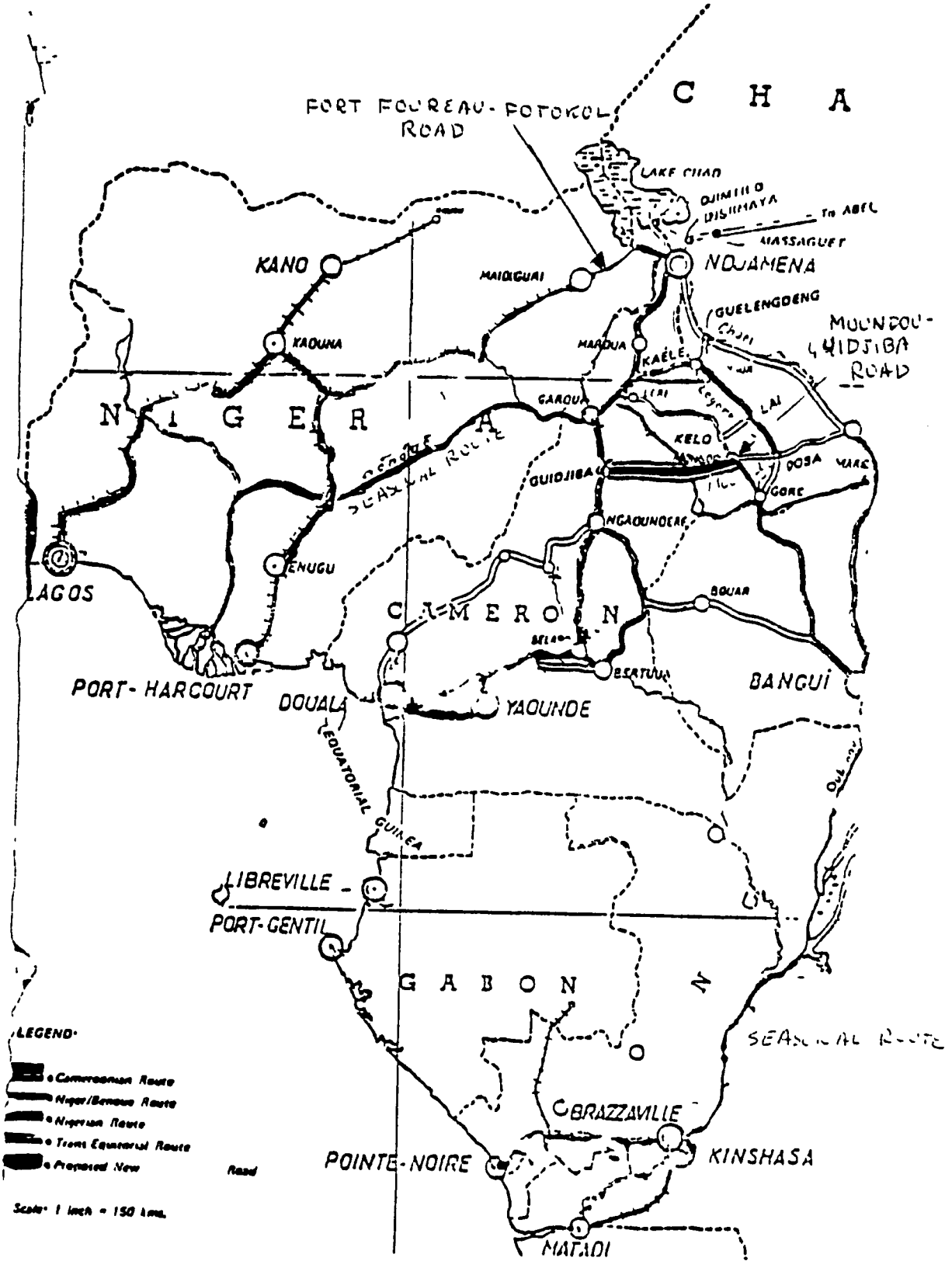

FORT FOUREAU-FOTOKOL ROAD
C H A
LAKE CHAD
DJIMTILO
DJIMMAYA
To ABEL
MASSAGUET
NDJAMENA
KANO
MAIDIGURI
GUELENGDENG
MOUNDOU-GUIDJIBA ROAD
KAOUNA
MARDUA
KAELE
N I G E R I A
GARDUA
LAI
KELO
DOBA
GORE
GUIDJIBA
SEASONAL ROUTE
NGAOUNDERE
ENUGU
LAGOS
BOUAR
C A M E R O O N
BERTUUA
BANGUI
PORT-HARCOURT
DOUALA
YAOUNDE
EQUATORIAL GUINEA
LIBREVILLE
PORT-GENTIL
G A B O N
SEASONAL ROUTE
BRAZZAVILLE
KINSHASA
POINTE-NOIRE
MATADI
LEGEND:
Cameroonian Route
Niger/Benoue Route
Nigerian Route
Trans Equatorial Route
Proposed New Road
Scale: 1 inch = 150 kms.

Table 1

SECONDARY AND FEEDER ROAD NETWORK
IN THE SAHEL IN 1977 (KM)

(1) Countries	(2) Secondary	(3) Feeder	(4) Total - Secondary & Feeder	(5) Total Network	(6) % of Roads in Poor Condition
Cap Vert (% Tot. Net.)	162 (21.4)	283 (37.3)	445 (58.7)	758	n/a
Niger (% Tot. Net.)	977[1] (5.3)	13,655 (74.3)	14,632 (79.6)	18,377	58[a] 96[b]
Mali (% Tot. Net.)	5,595 (39.3)	2,818 (20.1)	8,413 (59.9)	14,045	n/a
Gambia (% Tot. Net.)	130 (4.4)	1,954 (66.0)	2,034 (70.4)	2,960	67[a] 91[b]
Upper Volta (% Tot. Net.)	398[2] (2.4)	14,400 (87.5)	14,798 (89.9)	16,462	65[a] 87[b]
Mauritania (% Tot. Net.)	1,730[3] (24.4)	655[4] (9.2)	2,385 (33.6)	7,090	75[a] 97[b]
Senegal (% Tot. Net.)	6,140[5] (46.3)	3,530 (26.6)	9,670 (72.9)	13,250	n/a
Chad (% Tot. Net.)	991[6] (13.6)	4,575 (63.0)	5,566 (76.6)	7,260	n/a
Total (Region) (% of Tot. Net. in Region)	16,123 (20.1)	41,870 (52.2)	57,993 (72.3)	80,211	66[a] 93[b]

1 More than 50% of the road surface is defective, e.g., large ruts and potholes, washouts, etc.
2 33% of ordinary and improved earth roads.
3 Regional Roads.
4 Total Network - (regional & national roads)
5 Regional and Departmental Roads
6 5% of non-primary ordinary track plus laterite road and track.

SOURCE: Louis Berger International and INGECOM, Road Maintenance and Diagnostic Study for the Sahel - Draft Final Report, July 1977, Vols. 2-9

[a] Classified Network only

[b] Including unclassified network

COMPARISON OF THE FOUR ROADS

TABLE II

	Type	History	Econ Analysis	Critical Decision Elements	Linkages To Other Projects	Investment Per Unit	Conformance with Congressional Mandate
Kayes-Nioro	Between farm to market and point to point	PP currently being prepared	B/C=1 3 based on user savings op. lost capital = 10%	Closely linked with several development projects to benefit rural poor	close	medium	medium
Bamako-Bougouni	Major road 40% Bamako's international traffic moved	Loan signed. cost increases not approved by Congress. Deobligated all but $3 25 M for spare parts and maintenance	IRR 18% (user savings)	Congress would not approve increase in costs	loose	high	low
Moundou-Guidjiba	International route to Atlantic - 80% of cotton exports expected on this route	PID review cancelled 8/78	IRR 18% Analysis not available. Includes double counting	Was major trunk road	loose	medium	low
Lt. Pourcau-Fotokol	International route to the Atlantic	Loan for design approved 5/72	IRR around 18% Using maintenance and user savings, net value added to agriculture opportunity cost for capital = 8-12%		loose	low	low