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FROM - USAID/Kinshasa

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SUBJECT - Noncapital Project Paper - Kinshasa Irrigation Survey

REFERENCE - M.O. 1025.1

A. Identifying Data

Country:	Congo (K)
Submission Date:	September 18, 1968
Project Number:	660-11-120-024
Project Title:	Kinshasa Irrigation Survey
US Obligation Span:	FY 1969 through FY 1971
Gross life-of-project financial requirements:	
US Dollars	$400,000
US Owned Local Currency	-
Cooperating Country Cash Contribution	50,000
Other Donor	-
Total	$450,000

B. Summary Description and Purpose of the Project

Since independence the population of Kinshasa has tripled and at present is estimated at approximately 1.0 million. This increase has made heavy demands on food production in adjacent areas which have not been able to fully supply the Kinshasa market. To counter this shortage of food it is proposed to develop the irrigation potential of the area. The kind and scale of project that will result in sufficient water to minimumly meet the requirements of the Kinshasa area

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Enclosure:
Attachment A, Map of Potential Irrigable Area

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cannot be met by the GDRC or by non-AID sources. The latter have been pursued without satisfactory results by the USAID.

This project, which consists of a carefully supervised test drilling program to locate the best ground-water supplies for large scale irrigation development in the Kinshasa area east to the Congo River terraces is of vital importance to US objectives in the Congo and to the Congolese Government. The US has always attached cardinal importance to the Congolese agriculture sector which has never re-attained pre-independence levels. If Kinshasa is to remain a thriving capital and the seat of government of a viable nation there must be an adequate food supply for the area. The results of this project lead to that goal in five to seven years. The successful identification of irrigable zones will also lead immediately to two new projects, the identification of pilot irrigation plots and the construction of producing wells in the area.

Adequate post independence statistics on food production are not available, however, it is known that there is rarely more than 24 hours of staple food reserves readily available in the Kinshasa area. There is a definite need to reduce transportation hazards which increase with the distance produce must be transported and stabilize food marketing. If natural or political disasters occur, even on a small scale, Kinshasa experiences serious food shortages. Past disturbances have precluded the transport of food into the area. The USAID can attest to the lack of food during the disturbances of mid-1967. Moreover, as national wealth increases a gradual broadening of dietary demands will ensue.

Irrigation water must be developed in the Kinshasa area if food production is to be increased due to the rainfall pattern which is significantly out of phase with agricultural requirements, particularly for rice and vegetable crops. There is an uneven pattern of short and long wet seasons, followed by long and short dry seasons. Irrigation supplies must supplement rainfall during the wet periods, and particularly during the dry seasons. About 1600 gpm of water per 36 hectares of mixed vegetables, and 2000 gpm of the same area of rice are required. At present there are several shallow wells in the Kinshasa area yielding approximately 1300 gpm at best. Most wells yield considerably less. River water is generally not suitable for irrigation because of high sediment loads, which make sprinkler operation unfeasible, and high pumping costs due to the distances and elevation differences. On the basis of an initial study by a USGS geologist completed in FY 1968, there are excellent opportunities for developing large capacity wells suitable for irrigation in Kinshasa and to an area East of it. The project will require two years from the time equipment and personnel arrive on site. The following schedule gives a tabular breakdown of required life-of-project inputs:

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Time Period	Activity	Cost	Description & Explanation
A. US Inputs			
Jan 1969	Start procurement of commodities; 1 truck mounted (4x4) combination cable tool-rotary rig (WW 1) with a down-the-hole hammer; 1 4-wheel drive truck; 1 4-wheel drive pick-up; welding machines; casing; screens; mine equip; water level recorder; 1 WIDCO logger.	150,000	Commodities will be scheduled for July 1969 delivery.
Mar 1969	Execute PASA's with USGS for 1 French speaking Hydrogeologist and 1 Driller.	100,000	
Jul 1969	Arrival of initial commodities and two PASA employees.		Two PASA employees will spend approximately 60 days assembling equipment, hiring local laborers, and completing necessary arrangements and studies to get underway.
	Procurement of commodities: well casing (glass or stainless steel lined); specially designed well screens.	150,000	The screens will be selected by the two PASA employees and will be tried at various depths and conditions to determine best sand levels, and optimum orifice dimensions.
Nov 1969 to Apr 1971	Team will progressively drill sites selected by the geologist and pump to determine optimum pumping rates and yields in conjunction with adjacent wells during dry and wet seasons.		

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Time Period	Activity	Cost	Description & Explanation
Apr 1971 to Jun 1971	Preparation and submission of Final Report.		
Jul 1969	Two truck drivers Six laborers One Geologist Driller Trainees (from the Service des Sondages) Observers	Zaires 25,000 ($50,000)	The geologist will work, if available with the US geologist. Counterparts will be supplied for training purposes by Service des Sondages.

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C. Setting and Environment

The area in question including Kinshasa extends eastward about 50 km toward Maluku-Maes (see attached map). At present approximately 80 percent of this land is unoccupied and is generally not being utilized where there is occupation. The President has a 1200 acre block being farmed which is his personal property. However, it is not anticipated that this will prove a hindrance to the project or to any planned development of the entire area. Problems, however, could develop regarding the ownership of the area lands. Some, perhaps much of the land, may be in private hands or bound in complex tribal ownership patterns and laws that could preclude project use and/or later development. If AID/W gives preliminary approval of the project proposal, the USAID will survey the area intensively and determine land available and appropriate measures to effect, with the GDRC's cooperation and assistance, to make land available where it is not. The GDRC has whole-heartedly endorsed the project and the development of the land in discussions with USAID personnel. It is felt that the GDRC will take whatever measures necessary to free any land for project use if and when that problem arises.

The river terraces bordering the Congo River flood plain are covered with reasonably flat lands suitable for farming. Groundwater possibilities here are reasonably good. Groundwater occurs at shallow depths in the sand and gravel that form these terraces. The water-bearing sand and gravel forming the terraces are thicker and more permeable in the newly buried river channels that meander across the ancient flood plains. Two such channels have been identified and mapped by months of test drilling (see report of USGS Geologist Tibbitts). One of the buried channels is exploited for municipal water. A typical well in this formation produces in excess of 1000 gpm. Improved drilling techniques with better well construction will likely improve this yield.

The USAID estimates that there are easily 10,000 acres available for irrigation between Kinshasa and 28 km east on the Congo River terraces. When developed, this area can provide upwards to 4 million dollars in farm income. At the present time the area (other than around Kinshasa) is for the most part covered with savannah grass which is best suited only for cattle grazing. Manioc and corn are grown in the area with great difficulty and yields are unpredictable and uneconomical. With irrigation, it is anticipated that corn yields, for example, could be increased by 600 percent. In three to four years after project completion the area could develop profitable truck farming if potential is realized.

D. Strategy

The general strategy will be to implement the project through the Service des Sondage, Minister des Mines et Terres while maintaining technical autonomy and close liaison with the Ministry of Agriculture.

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It is felt that the geologist should be free to determine the test drilling aspect of the project and not be subject to Service des Sondage authority as to methodology and matters that require technical expertise. The Service does not possess an adequate technical level of competence to fruitfully guide the project's efforts. However, to exclude the Service would be unwise for political and overall strategic reasons. While the Service does not possess a high level of skilled personnel, this project can serve as an excellent way to introduce an appreciation of modern drilling and other techniques, influence any lethargy in administrative practices and methods, and create a germinal core of skills which the Service can build on and apply elsewhere in the Congo.

An agreement will be reached with the Service which will allow the project to operate in conjunction with that department, but allow autonomy to the geologist, as described. An approach would be to request that the Service make personnel available to the geologist to work on the project with the geologist not only to implement the project but to be trained in the use and maintenance of the well drilling equipment.

When approval is given by AID/W the USAID will commence laying the ground work for a workable agreement with the Service des Sondage.

E. Cooperating Country Leadership

As mentioned previously the GDRC has expressed interest in and support of the project and its potential. The USAID has talked with the Minister of Agriculture and to the President's Advisory Board (four men) on agricultural matters (College d'Agricole). It is felt that the above can and will provide the necessary GDRC leadership to insure the success of the project and fully realize its potentials.

By way of specific tangibles the GDRC should provide necessary office and garage space and take whatever measures are necessary to make available any land encumbered by tribal or other ownership.

The USAID feels, however, that due to the relatively low cost and highly technical nature of the project, the contribution of the GDRC is limited. The project, moreover, admits to a very small number of personnel with one expert directing the efforts.

F. Cross Relationships

As mentioned previously, this project will lead to a new one, i.e., well construction in recommended zones. When irrigation has been established for the area, sufficient farmers to work the land will be required. Preparation for this should start at least one year in advance of project completion by the Ministry of Agriculture. This will permit potential farmers to familiarize themselves with the area and permit crop deployment plans. Congolese farmers have expressed great interest in agricultural credits, possibly small

lines of credit to potential farmers could be established in conjunction with the Ministry of Finance and other donors (see Supervised Agricultural Credit for a long range plan for the GDRC). The USAID expects to assist the Ministries of Agriculture and Finance and work with other donors to establish a workable solution which will permit farmers to "set up shop" on irrigable lands and receive the necessary technical assistance for the transition to modern and larger farming methods.

The eventuality of truck farming for the entire area will require that the Ministries of Public Works and of Transportation and Communication develop plans that will permit the economical transportation of produce to market areas. At present there is one all weather road leading east to west into Kinshasa. It is anticipated, however, that new roads in the irrigated area will be needed to transport crops to the main road when full potential is realized. Possibly new sites will develop which will require accessible routes not yet envisioned. The USAID will advise the Ministries and keep them sufficiently abreast of project progress in order that plans may be drawn up and coordinated with an overall agricultural scheme.

The French, and Chinese Agricultural Missions, and FAO already have limited programs in adjacent zones whereby truck farming techniques are being taught to Congolese farmers. These donors should be encouraged to augment these efforts and coordinate them so that when the time comes to expand truck farming into irrigated areas sufficient skills and expertise will be available. The USAID will advise the aforementioned donors in order that all efforts can be directed toward a common truck farming expansion goal.

Irrigation will permit a diversity of crops not previously available on a large scale in the Kinshasa area. New tastes and dietary habits will be required and should be encouraged. This appears to be an excellent sector for the Ministries of Information and of Health to direct their attention. These Ministries should work out a program to "condition" markets for maximum sales, and for an awareness of nutritional values of various foods with a view toward more balanced diets. The staple diet of most Kinois is manioc, as the fundamental food, with some bread, plantains and occasionally rice or corn.

A broadening of food intake will require a well conceived and executed program, because old dietary habits will not be supplanted easily. An overall scheme for crops to be grown for the entire area to be under irrigation will have to be worked out, as well as a system for storing reserves and other produce which will not be immediately absorbed on the market.

G. Planned Targets, Results and Outputs

The successful completion of this project should result in at least 10,000 acres of land

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available for large scale irrigation from well sites recommended by the geologist. This will lead to the identification of pilot irrigation projects which the USAID will recommend. When experience has been garnered from the pilot projects after a period of approximately eighteen months, well construction could begin. As stated these will be new projects which the USAID will study and probably present as a proposal for further assistance if feasible. With well construction completed, farming will commence according to pre-determined plans. The long range goal of the present project is to make available large irrigable areas which will increase production of food crops, close to Kinshasa, with resulting decrease in food costs and quite probably diversification of kinds of produce to be offered over the basic staples now available.

H. Course of Action

See table in section B for course of action proposed. Information provided there describes how project is to be carried out within the general time frame.

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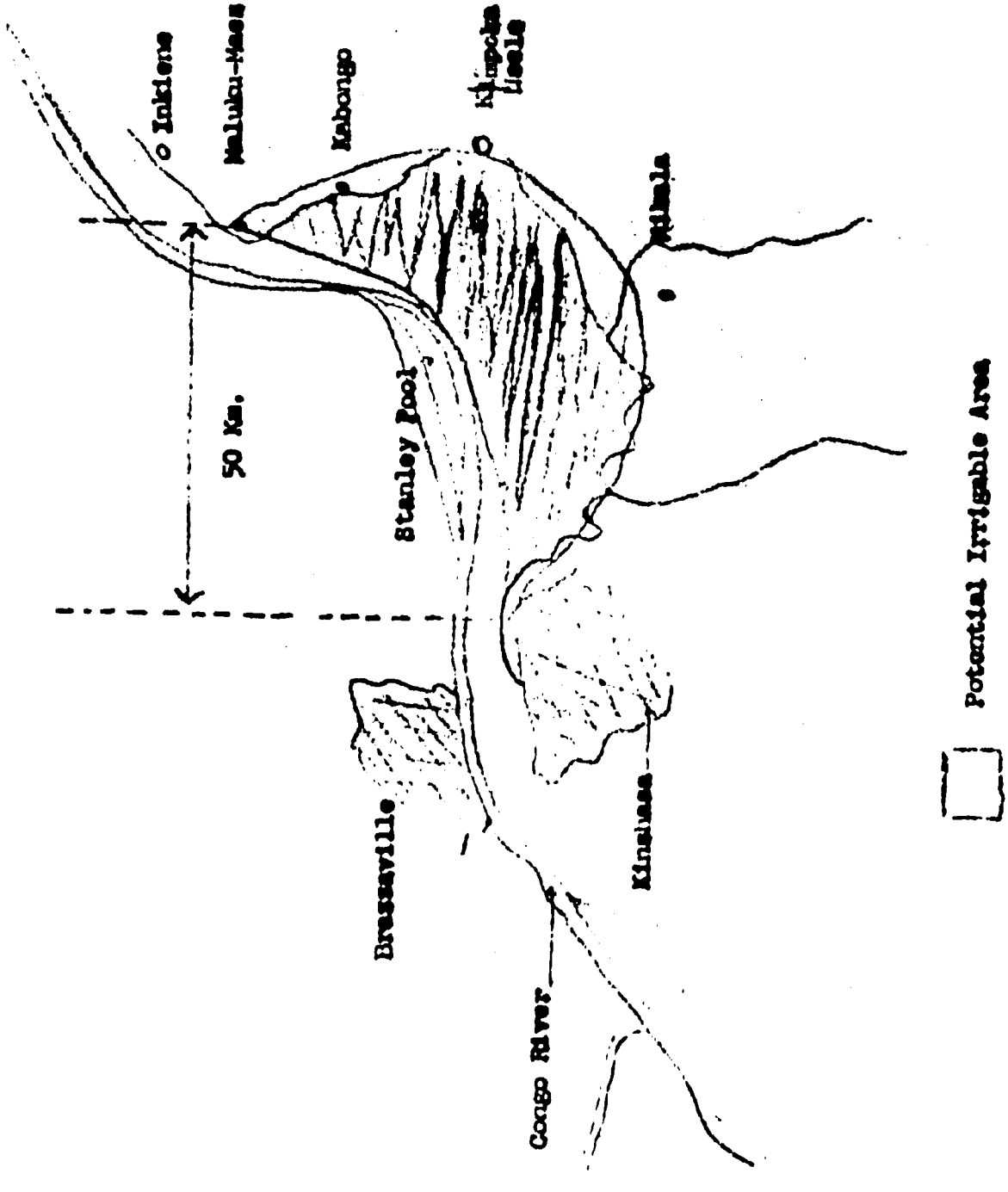
Attachment A, Map of Potential Irrigable Area

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