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PEOPLE AND WATER

Social Soundness Analysis

for the

Mandara Mountains Water Resources Project

for USAID - Yaoundé

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by

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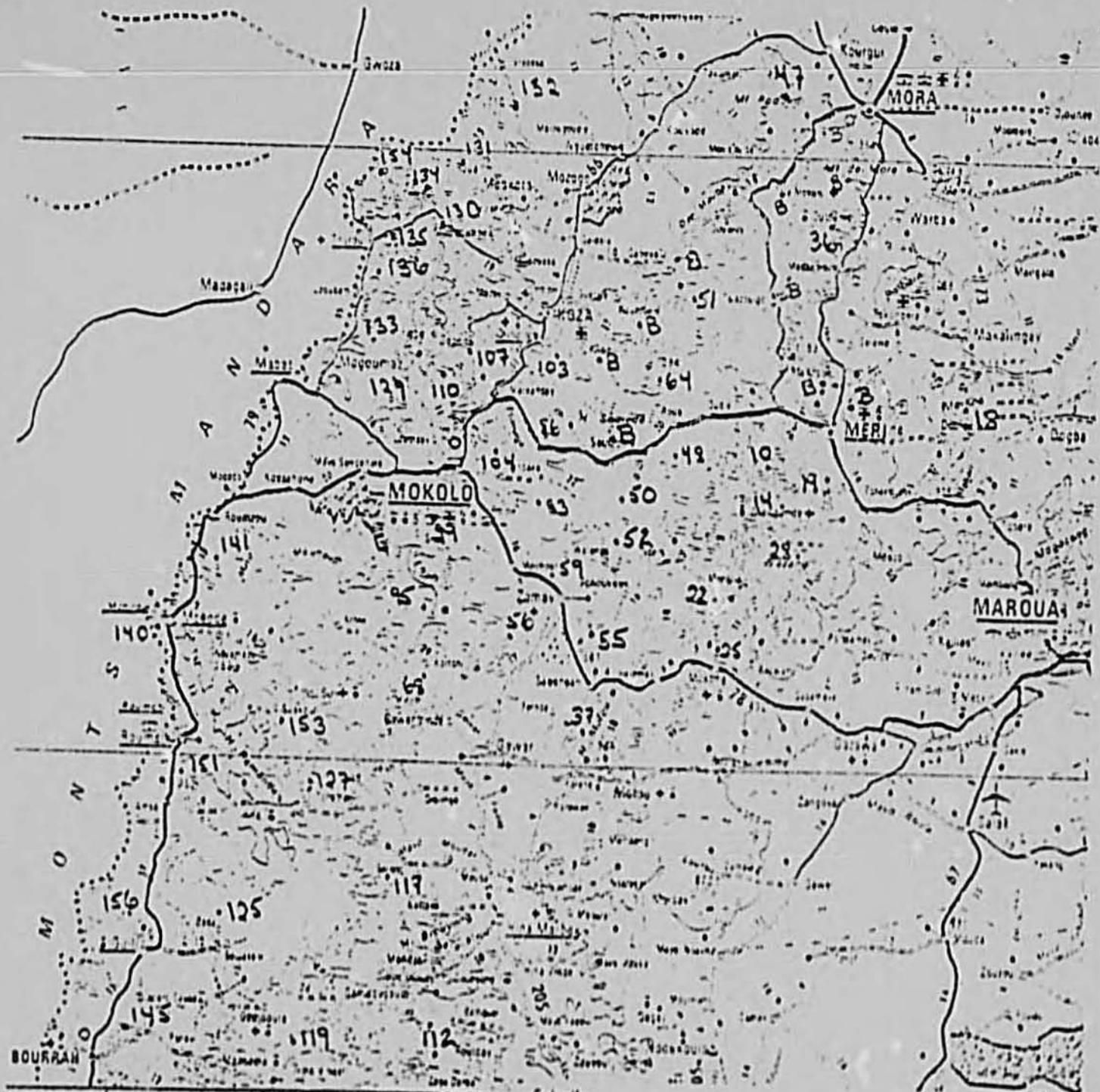
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MAP OF SITES



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INTRODUCTION

"Water is life! Water is joy!" (Mofu farmer)

"Water is the head of us all." (Bana farmer)

Undeniably, water is vital for life. Yet, attitudes towards water vary from region to region and from people to people, according to its accessibility, abundance and permanence. When it is scarce, water is the center of man's preoccupation. It is, therefore, astounding that nowhere in the ethno-sociological literature on the Mandara mountains people ¹ is discussed the very obvious problem of lack of water. Indeed, even in the standard studies of Podlewski (1966), Martin (1970), and Boulet (1975a), the use of water in the people's daily chores is surprisingly ignored. Even Boulet who discusses at length the time spent for each domestic activity by household in the village of

Specially Jean-Yves Martin, Jean Boutrais (1973), Jean Boulet (1975a), Antoinette Hallaire (1976). See in Bibliography full references of articles and books cited in footnotes.

Magoumaz, to the point of giving the time needed for fetching termites to feed the chicken during the dry season, fails to mention the fetching of water.² In most regions of the Mandara Mountains, the women spend a third if not half of their waking hours fetching water during the dry season.

The fieldwork of the present study, undertaken between November 4, 1977-February 4, 1978, is related to the proposed construction of 47 dams in the USAID Mandara Mountains Water Resources Project. These dams are designed to provide water year-round for man and animal in that entire region. The main objective of our research was to study the problems related to water as it is presently experienced by the mountain people and to determine the relevancy and social impact of the proposed project.

Research Procedure and Conceptual Framework

The 47 dam sites within the Mandara Mountains region were chosen by USAID, based on a report done by the French Engineering Consulting firm SOGREAH.³ This region includes a diversity of ethnic groups⁴ which we have divided into six ethnic regions on the basis of their access and

² Boulet, op cit pp. 83-85.

³ See SOGREAH reports.

⁴ 27 Ethnic groups are indicated in Hallaire et Barra1.
See also Boulet (1975b).

distance to dam sites as well as on the basis of the dam sites and density of population in each region.⁵ In all, 21 sites were studied or visited:

1. Sites 19,⁶ 14 and 28 located in the Meri arrondissement, and site 25, in the Mokolo arrondissement, are in the Mofu ethnic region;

2. Sites 99, 104, 86, 110, 129, 197, 136 and 130 located in the Mokolo arrondissement, are in the Mafa ethnic region.

3. Sites 135 and 154, located in the northern section of the Mandara Mountains and along the Nigerian frontier of the Mokolo arrondissement, are in the Hide and Ngossi ethnic regions;

4. Site 47 in the Mora arrondissement, is in the Podokwo region; and site 18 is in the Mada region; Sites 140 and 153 (and 137), in the canton of Mogode, are in the Kapsiki region. Finally, sites 156 and 125 in the Guili canton are in the Bana region.⁷

⁵ No figures are available as yet to sizes of villages or to population by ethnic groupings. The most up-to-date data available are the following:

<u>Arrondissement</u>	<u>Total Population</u>	<u>Rural Population</u>
Meri	51,438	50,001
Mokolo	324,925	319,131
Mora	171,385	167,131

(From République Unie du Cameroun, Décret No. 77/386 du 30 Septembre 1977, pp. 13-14)

⁶ The numbers used here are those indicated in the SOGREAL report.

⁷ In a preliminary trip in the Mandara Mountains between Nov. 4-15, 1977, the following sites were also visited: sites 55, 52, 151, and 145 besides the sites already listed in the text. Report of the first joint trip was submitted to USAID, Yaounde, on November 28, 1977.

The exact location of each dam site was essential for our study in order to identify those inhabitants who would be affected by the site. However, in most cases, the Chief of the village and the local administrator were also interviewed as their role and help in the actual hiring procedure as well as their opinion on the dam sites and maintenance problems may be influential. The search for the dam sites involved a great deal of time spent in mountain climbing, at times hazardous,⁸ and in walking great distances. This point is brought up because it limited, in many cases, the number of people interviewed⁹ but it also impressed upon us the importance of considering each site independently for each had different characteristics thus bringing up different problems.

SOGREAH's choice of dam sites was based on three specific criteria, excluding the order of priority given to the dam itself:¹⁰

1. Number of households served by the reservoir (the minimum of 100 is given) with two perimeters of potential influence indicated,

⁸ Even the SOGREAH engineers indicated that the sites are extremely difficult to reach and climbing the mountains would need great athletic ability. See SOGREAH report, Part II, piece C-1, p. 7.

⁹ See Annex 1. List and Itinerary of Sites Studied. The cumulative number of people interviewed for this study amounts to a total of 160 individuals.

¹⁰ SOGREAH report, ibid pp. 9-10, see also USAID Memorandum, PID, March 14, 1977.

one with a radius of 2.5 kms and the other within 5 kms;

2. The cost per m³ of potable water (less than \$6 per m³ as an acceptable limit);

3. The distance that supplies would have to be carried to the dam site.

For the purpose of this sociological study, the first criteria is of particular significance and is the weakest point of the SOGREAH report as will become obvious in the course of our analysis.¹¹

The core of our study is the relationship between people and water. It is, therefore, important to note here that this is not an anthropological or sociological description of the ethnic groups dealt with in the investigation. Such studies are widely available mainly by French researchers and USAID consultants requested to present anthropological descriptions of Northern Cameroon¹² and such data will be used only when relevant to our discussions.

The salient aspects of our investigation dealt with eight main topics:

1. Traditional use of water (division of labor, ways of fetching water, traditions linked to water, etc.)

2. Health standards in relation to water;

3. Local initiatives relating both to well-digging and community development projects;

¹¹ See part III of this study for a discussion of the SOGREAH perimeters of influence

¹² USAID consultants: see Hoben; Boulet (1975b) and for French researchers: see full references in bibliography.

4. Social change due to an increased reliance on a cash economy and migration;

5. Local participation in dam construction and maintenance;

6. Dam construction and its social and religious impact: effect on land tenure, religious sites, resettlement, agricultural activities and use of water;

7. The relative merits of dam and wells and their relevance to the radius of influence for population concerned;

8. Possible complementary projects.

The discussion of the above-mentioned aspects will be integrated in the four parts of the report:

Part I - dealing with the relationship between people and water;

Part II - reflecting the problems relating to the dam construction;

Part III - discussing the maintenance and the use of the dams;

Part IV - conclusion and recommendations.

PART I

PEOPLE AND WATER

One of the most outstanding characteristics of the societies of Northern Cameroon, and in particular in the Mandara Mountains, is the contrast in the people's life-style between the rainy season and the dry season.¹³ Central to this change is the variation in the availability and accessibility of water sources. In rainfed agriculture, activities are governed and geared to rain cycles. This is essentially true for the mountain dwellers while dryfed activities are becoming more prevalent among inhabitants of the plains. Less evident in the literature, however, are the seasonal variations in the fetching of water, an activity of great importance socially and psychologically to the daily life of the family and the village.

A. The Fetching of Water

The dry season, generally between the months of December to May, and especially beginning mid-February, greatly increases the burden

¹³ An attempt to regulate these seasonal variations is found in the important religious and agrarian functions of the Master of the Rain, common to most of the ethnic groups of the Mandara Mountains. Such a role is so significant that at the death of the Master of the Rain the ethnic group or clan affected must respect three to five years of mourning (depending on the group). During that time, the sacrifice of the "boeuf de case," a feast called "maray," is delayed until the day after the installation of the new Master of the Rain, as is the case presently in Moundoukwa where the new Master of the Rain of the Mafa will be installed in three years. On the other hand, if the Master of the Rain does not fulfill his role he may risk being chased from his village as it happened several years ago with the Master of the Rain of Houva who had to take refuge in Oudahay (see J.Y. Martin, p. 130; this incident was also confirmed to us during our interviews at Houva).

of fetching water. During the rainy season the water is easily accessible and abundant within the village, whether from the "mayo",¹⁴ the traditional or modern well or from mountain springs. As the dry season progresses, the gradual diminishing and, in most cases, complete drying up of all village water sources forces the villagers to fetch water farther and farther away from their homes. This may lead them to walk distances varying from 4 to 14 kms round-trip. For example, in the area of site 19 at Gouley, from the hamlet of Kilouo to the water source at Meri, the distance may extend between 8-12 kms round-trip. On the other hand, an extreme but by no means unusual example is that of Gousda (site 107) and of the Koza area in general.¹⁵ Before the existence of the Djingliya dam,¹⁶ the mountain dwellers of Gousda, of Meldere (site 103) and the plain-dwellers of Koza all had to climb several mountains and cross a long plain before reaching a common water source in the area of Souléde. This was a round-trip distance of at least 18 kms. The dam of Djingliya has shortened by half the distance for some, depending on which side of the mountain they live.

¹⁴ "Mayo" is a Fulfulde word meaning river and is commonly used throughout the North.

¹⁵ Of the sites visited, similar situations obtained in the areas of Mokong (site 25), Tourou (135) and Moundoukwa (130).

¹⁶ This dam was built by the "Génie Rural" of Mokolo. Although it is still under construction, it has been in use for the past three years.

Just as distances to water gradually increase with the progress of the dry season, so does the frequency of fetching water. The average number of trips during the rainy season may be two while during the dry season it may increase to four.¹⁷

The number of trips to fetch water, whether in the rainy season or dry season, varies according to the size of the family, but the difference in number of trips between the two seasons is due mainly to the number of animals each family has. This is explained by the fact that animals are not given water during the rainy season¹⁸ while, because of the lack of water in the village during the dry season, water has to be fetched for the household animals, some of which are kept indoors, beginning at sunset.¹⁹ Exceptions do exist, on the

17 These averages are deduced from the interviews held with the Mofu, Mafa, Hide, Ngossi and Podokwo. They do not pertain to the Bana and Kapsiki whose cattle-rearing traditions are distinctly different from the former groups.

18 According to our interviewees, during the rainy season cattle and sheep are fed indoors on freshly-cut herbs, therefore moist, making it unnecessary for the animals to drink. However, sheep and goats drink from water holes around the "saré".

19 Our observation does not seem to substantiate commonly-held opinions in the literature concerning the sacrificial cow (boeuf de case) kept indoors for two to four years depending on the ethnic group - Mafa or Mofu - until the feast of "Maray" when these animals are sacrificed. J. Y. Martin, Boulet (1975a), Cuenot, Vincent (1971), Podlewski (1966a) and Hoben maintain that the "boeuf de case" (stall-fed cattle) is a fast-held tradition. Such a tradition is obviously maintained during the rainy season as a protection to the terraced agriculture practiced in the Mandara Mountains. The custom of stall-fed cattle breaks down during the dry season. Indeed, throughout our investigation among the Mafa and Mofu, at the beginning of the dry season, farmers indicated to us that, in most cases, cattle destined for sacrifice, as is ordinary cattle, were left free to roam during the dry season. Moreover, even at Moundoukwa, the headquarters of the Chief Master of the Rain of the Mafa, the village head confirmed that the sacrificial cow is kept indoors only one year before the "maray".

other hand, for families of blacksmiths and potters may make up to seven daily trips due to their extra need for water in their work mainly undertaken during the dry season.

Fetching water is entirely the woman's responsibility throughout the region during all seasons. Theoretically, men are said to bear the responsibility of fetching water for their animals and for the construction and repair of their compound, the "saré".²⁰ The practice, however, of such a division of labor is not maintained in most cases. Especially among the younger generation living in the plains, it is the wife who ends up by "helping" the husband to fetch the water necessary for the animals and to build and repair their sarés. It is only fair to add, that the men do participate in specific instances: if he is single or divorced living with old parents, if the wife is too sick and there is no co-wife to help or, in exceptional cases, if the wife is too old or is too tired from fetching wood. Children, both boys and girls, learn how to help their mothers at a very early age and their load increases as they grow older. Toddlers of three years are seen following their mothers with small jars or metal pots precariously balanced on their heads. It should be noted, here, that this is one of the first

²⁰ There is an exception to the rule. Chiefs cannot be allowed to fetch their own water for whatever need they may have. It is the acknowledged responsibility of their wives (for in most cases they are polygamous) to accomplish that duty. Two types of organizations have been observed during our investigation: (1) The fetching of water for the needs of the chief rotates among his wives (as for example with the Chief of Douvongar and Gouley) and, (2) everyday, a calabash of water is taken from the jar of each wife as is the particular case of the chief of Wazang who has 30 wives.

and most obvious indications of the integration of children in the socio-economic structure of the family.

It can well be seen, from this brief description, that women will be the first and foremost to benefit from any water resources project that may reduce the distances and the time they spend in that crucial tasks around which the household revolves.

B. Physical and Psychological Impact of the Fetching of Water

It is implicit that the increase in distance and frequency in the daily chore of fetching water during the dry season, particularly in February and May, consumes most of the women's working time. But it should also be noted that the drop in the water level of the various sources of water during that period, forces the women to wait for hours to fill up their water jugs.²¹ The overall time spent in the fetching of water is therefore greatly increased.

A case in point: a woman of the hamlet of Damrak in the village of Tourou (site 135) will go to the river at the foot of her mountain, five minutes from her compound, during the rainy season. During the months of December - January, she would have to walk 2 to 3 kms further down the river to fetch her water but as water is still available at that spot, her wait is not long. Beginning the month of February, the water level is much lower and becomes progressively lower so that the

²¹ Similar to the previously mentioned traditional attempt to regulate rains through sacrifices held by the Master of the Rain, we have found that among the Hida and Ngossi attempts to maintain water levels in ancestral wells are also made by either the blacksmith (Hida) or the subchief of the village (Ngossi) through regular sacrifices at those wells. These functions are hereditary as are those of the Master of the Rain.

women have to dig in the riverbed and wait, at times overnight, for the water to rise to the surface. Thus, if the burden and distance have not increased, the time consumed, adding to her fatigue, has almost doubled.

One of the most striking statements, repeated by the women of the Mofu, Mafa and Hide areas, is their exhaustion because of lack of sleep during the height of the dry season. This is incurred by the time spent in fetching water but it should also be added here, the time spent in fetching wood.

Indeed, one of the activities particular only to the dry season throughout the entire Mandara Mountains is the fetching of wood. While the women do complain at the men's lack of help in the chore of water, it is inconceivable for them that their husbands may participate in this also exhausting yet exclusive activity of women. In fact, only the daughters help their mothers in this burden while, it was observed, boys are never involved in that activity.²² The division of labor is so strictly maintained in this case that, among the Hide and Mafa (at Ldingding, close to the Nigerian

²² J.Y. Martin's study of the division of labor within the household in Magoumaz (pp. 118-119) coincides entirely with our interviewing and observations, except in the two particular cases pertaining to the fetching of water and wood. Here, our observations are the reverse of his. Indeed he indicates that the transport of water is the exclusive domain of women and girls while the transport of wood falls within the tasks of all ages regardless of sex. Surprisingly enough, during our visit to Magoumaz (site 129) on Dec. 20, 1977, we stopped at various water sources in the mountains and met men, women and children who were all fetching water. This observation is substantiated in our investigation not only in the Mafa area but in all other areas of the Mandara Mountains.

border), the women save enough wood for one or two years and among the Kapsiki she accumulates wood, which can last for nine years. In the latter case, it is not only set next to the saré but is incorporated in the very structure of the outer walls of the compound. Such amounts are saved for times of sickness and for old age when the women can no longer fetch her own wood and can rely on no one else to fetch it for her.²³

The cumulative time consumed in fetching both water and wood not only increases the general state of fatigue and diminishes sleeping hours, but also affects time involved in the care of children, of the house and in the preparation of food. All these factors inevitably create tensions within the household as well as among the women themselves.

Indeed, during the dry season, when women wait the longest at the water source, quarrels leading to the breaking and stealing of jars and tearing of clothes are not uncommon and were openly admitted in most of the villages visited. This is in spite of the institutionalized organization of an orderly placing of jars according to the women's arrival at the water source. Impatience being a universal human characteristic, some women, by overstepping their

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The strictness of this custom breaks when the men go to work in the urban agglomerations during the dry season. One of the common menial jobs done by the men in the town is precisely that of gathering wood in the "bush" and selling it to the townspeople. On the other hand, where water is sold in the town, men do all the fetching and selling as well.

prescribed position in line incite these quarrels.²⁴

C. Social Change and Water

One of our concerns was to investigate the present manner in which water is extracted from the mayo or from the other traditional water sources as a means of understanding traditional or newly acquired levels of health awareness in relation to the quality of water.

A widely observed manner of drawing water from the mayo was to dig a hole next to the river bank, thus creating natural filtration of the water before extraction. This is essentially common if not also necessary throughout the region during the dry season when the river bed is dry at the surface. Moreover, it was also observed among the Mofu in the region of Douvanger (site 19), Douroum (site 14) and the Mafa at Moundoukwa (site 130) that even when water was flowing in the river, a hole was dug next to the river bank before the extraction of water. While, among the other ethnic groups, even the Mofu of Mokong (site 25) and the Mafa of Gousda (site 107), water flowing in the river was directly drawn and no filtration system was maintained. The consistency of the difference observed between these regions indicated that a traditional awareness of health

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It was noted among the Podokwo and the Hide that there was a socially accepted way of overstepping one's position in line, thus defusing tensions: women are allowed to leave their jugs along the water hole according to their arrival. However, if the last one in line finds water readily available (as it takes, sometimes, over an hour to rise to the surface) she can overstep the jugs ahead of her. She must, however, fill the very first jug in line and replace it with the second one without having to fill any other jug but the first one.

standards in relation to water existed among the Mofu at Douvanger and Couroum and the Mafa at Moundoukwa, but certainly not among any of the other groups, whether Hide, Mafa, Ngossi, Bana or Kapsiki. In further pursuing the reason for such behavior among the first groups mentioned, the explanation given, in most cases, was the water flowing in the river was not clean as it gathered all dirt and refuse along its way down the mountain and it was therefore necessary to filter it for human consumption. Yet, in the similar attempt of delving into the relationship between health and water among the other groups, a consistency was also revealed; "If God gives you water that flows, it is foolish not to draw it directly." This was expressed regardless of the level of acculturation of the individual interviewed (acculturation due to formal education, migration to the city or the plain, etc.).

Although missions exist in the regions of Couroum, Douvanger and Moundoukwa, the traditional manner of filtration existed before their presence in the region, as confirmed by the missionaries themselves. On the other hand, it could be said that the rationalization of the tradition maintained (i.e. conscious relationship established between health and water) may be the influence of the health campaigns and dispensaries of the missions. It should be noted here that such campaigns relied on an already deeply-embedded tradition and is a good example of the integration of modern concepts and traditional practice. Other missions in different areas, such as Gousda (site 107), Mogode (site 140) and Sirakoutou (site 153)

are not as lucky and the impact of their health campaigns extend only to encouraging the villagers to come to the missionary dispensaries (when they exist) to buy the medicine necessary for "the sickness due to water." Thus, if at Sirakoutou we were told that water brought about certain illnesses, leading us to hope that a health awareness may exist in the village, this was quickly dispelled for no idea of how to avoid the sickness by even minimal filtration of the water existed and the only remedy was to go and buy medicine from the mission dispensary. Indeed the health campaigns which are undertaken by missions as well as government health services with the goal of introducing the use of disinfectant in drinking water after its extraction from the river have completely failed, even where women and men admit to its health value and even among the already sensitized individuals of Douvangar and Douroum. This point is made to bring out the importance of the existence of wells in minimizing the problem of sickness due to water or its lack of filtration.

Differences in general health standards do not exist between mountain dwellers and those who have settled in the plains, yet differences in lifestyle and attitudes are most prominent. Indeed, it is these differences which attract a greater and more spontaneous descent from the mountains, especially among the younger generation. It is often asserted that wives encourage their husbands to settle in the plains, and in some cases threaten to leave them if they do not do so. One of the most significant reasons for this pressure is due to the increasing difficulties in the fetching of water in

the mountains although the attraction to modern living linked to the plains is also an undeniable factor.

The movement from the mountains to plains started as early as 1920 but it did not become government policy until 1963 when colonization of the plains was enforced on the mountain inhabitants and reached most of the regions of the Mandara Mountains. This forced process of resettlement, however, was stopped in the late sixties and although similar programs are still continued, they are based on voluntary settlement of families and individuals.²⁵

The descent from mountain to plain brought about immense socio-economic and religious changes to inhabitants of both mountains and plains, the most obvious impact being seen in the introduction of a now indispensable cash economy, leading to greater consumption needs and attraction to modern luxury items, such as radios, bikes, motorcycles, clothes, aluminum roofs on newly built houses, etc. But this change cannot be thought of as the result only of the descent to the plains for there have been patterns bearing directly on mountain dwellers since 1920, such as seasonal labor migration to urban centers, schooling, taxes, all increasing the need for a cash economy within the remotest regions of the mountains.

It is not our purpose to discuss in this paper the various impacts of this often overwhelming change in the region but to show the effects they may have had in relation to water. All along our investigation,

²⁵ see Hallaire (1976), Boutrais and Hoben

we were able to observe interesting local initiatives and individual motivations.

One of the first and oldest local initiatives took place in Douvangar where the predecessor of the present Chief of Canton undertook, in the plain of Kilouo, the construction of a small dam as early as the forties in the attempt to solve the dry season water shortage. The elders of the village still remember with pride their participation and that of the entire village at the time of the construction of the dam for which cement, a rare commodity, was used. Last year, Father Tabart of the Catholic Mission of Douvangar began reconstructing the old dam now in decay and found as great an enthusiasm and pride in the participation in that "restoration" project as in the old days.

If the construction of a dam is an exception, the digging of wells through group or individual initiative has become common. Often, well digging is done with the material help of the local mission. Cases in point: Douvangar (site 19), Douroum (site 14) Goujimdele (site 47), Guili (site 156). Yet, it is even more admirable to discover cases of individual realizations without the resort of external assistance. For example, at Toufou, a hamlet in Tourou (site 135), a man of the mountains dug with the help of his son a well next to the mayo below his saré. Alone, with a metal bar, they dug in rocks a well eight meters deep. Although no one else in the village helped them, the well is used by all their neighbors, especially during the dry season.

Another interesting but contrasting example is that existing in Guili (site 156). A few families or individuals have hired the local well-diggers and bricklayers to build them a private well which they lock to prevent neighbors and strangers from over-using the water during the dry season. This is an extreme example of the property rights of water unusual to the area.

The case of Mogode (site 140) is yet more unique and is the first and only example of the commercialization of water observed in a rural area.²⁶ A genuine traffic of "pousse-pousse"²⁷ carrying six to eight plastic jerricans, blue or red, or metal containers all filled with water, is constant and frantic between the wells in the plains and the houses along the main road. Twelve such "pousse-pousse" are said to exist in Mogode owned by local merchants who hire children between 6 and 14 years old to fill the cans and sell the water in town. Each boy in charge of a "pousse-pousse" earns 40% of the daily gains which may amount to 600 or 800 CFA, while each jerrican is said to be sold for 25 CFA, more or less, according to its size.

The commercialization of water in Mogode began some seven or eight years ago when "Hausa" or Nigerians from the other side of the border came to sell water which they carried in a metal bucket hanging

²⁶ It is not uncommon to find in urban agglomerations of Northern Cameroon, such as Maroua, Mokolo and Mora, water sold regularly from house to house by water carriers. It is already integrated in the social and economic system of the city.

²⁷ A "pousse-pousse" is a push cart

on each end of a stick balanced on their shoulders. This was soon picked up by the mountaineers who used their donkeys to carry water instead and sell it in the mountains. While still continuing, the use of the donkeys has diminished in the mountains because of gradual settlements in the plains. However, the local "pousse-pousse" have replaced the Nigerians by taking over the commerce in water. Regrettably, our short stay in the area of Mogode did not allow us to further pursue a socio-economic study of this interesting phenomenon.²⁸

All these initiatives locally motivated by the villagers for the sole purpose of facilitating for themselves the daily burden of fetching and carrying water have reinforced the need for permanent and easier accessibility to water.

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This information was passed to Mr. Eketi in charge of the economic analysis of this project with the hope that he can pursue and integrate it in his study.

PART II

THE CONSTRUCTION OF THE DAMS

The construction of the dams does not only concern technical and engineering problems but important social factors are implied and involved in the hiring of laborers as well as in the building and maintenance of the dams. On the one hand, consideration of the site in relation to sarés, to religious sites or to land tenure traditions may be relevant in the eventual decision of the ultimate choice of a particular site. On the other hand, the selection of the labor force for the construction of the dam also has socio-economic implications. What social effect will this choice (whether within or outside of the dam's perimeter of influence) have on the communities involved? What will be the economic benefits, who will benefit, etc.?

The following section attempts to deal with these topics with the aim of presenting the most appropriate solutions which may be the least disruptive to the community as a whole thus also benefiting individuals and families affected by the dam site.

A. Dam Construction, Displacement, and Sacrificial Rites

The objective of our visiting the exact site of as many projected dams as possible (21 out of 47) was to attempt to find out whether a damaging impact on the communities in which the dams may be built may arise. Our concern was for three major social problems: land tenure

traditions, possible cases of displacement of fields and sarés, and religious sites affected by the dam.

The land tenure traditions of the important ethnic groups visited - Mofu, Mafa, Bana and Kapsiki - have major differences, although, they have a basic similarity. All land which is cultivated is owned by the individual who can use it, within the confines of his village, as he wishes. There is no need, at this point, to go into the details of the various land tenure options as good studies already exist, in particular, useful summaries can be found in Boulet (1975b). It is enough to mention the major differences between each group. Among the Mofu, the Chief owns all the uncultivated land and protects all cultivated land. Among the Mafa and the Kapsiki, the land belongs to the Master of the Rain with cultivated land belonging to the individual.

Given these differences, it is important to find out whether the individual losing land as a result of the dam construction - such as flooding or limits set for a security zone - may be able to deal with his problem within the traditional system or whether external assistance (in resettlement or compensation) would be needed.

Our observations were that the differences between the land tenure systems should not affect, one way or the other, the eventual problem of resettlement. The determinant factor is whether land is available in the village or not. This point is significant for in all cases interviewed, the consensus of opinion was that it was upon

the individual to solve his problem on his own without the need for either chief or administration to intervene. The problem of resettlement would not exist in villages where there was no shortage of land as the individual would either buy, borrow or clear unculivated land. It is only when there is a shortage of land in the village that resettlement becomes a problem. In extreme cases, the loss of land may force the individual to leave his community. Such a solution was never chosen as an option by those interviewed, that is, a solution would always be attempted within the village and among the villagers themselves. It was, therefore, necessary to see whether a land shortage existed in any of the sites studied.

Not one example can be cited of any significant land shortage, even if fields of several families would have to be flooded by the dam waters. Owners of these fields generally considered the problem easy to solve within the village means although most of the fields to be flooded would be primary fields of great loss to them.²⁹ On the other hand, in the case of a security zone of over 30 meters, the problems may become more acute in several cases because, even the sarés would have to be abandoned and a great number of families displaced. In such cases, individuals solved the problem by saying

²⁹ The primary fields for the mountain peoples are those closest to their habitation, and the most important for they cultivate there their main staple, millet. In their secondary fields they may grow peanuts, beans, etc., and many of these fields are now in the plains, sometimes several kilometers away from the habitations.

that they would rebuild their sares in one of their secondary fields, either in the mountains or the plains. However, it should be pointed out that this is not such an easy solution. Quite to the contrary, as many of those in the mountains now are only the old or the widowed, the reconstruction of their sarés elsewhere would be an insurmountable problem, as they are too old to rebuild or too poor to pay for help.

It is pertinent to bring up at this point the problems that may result from a security zone above the dam as a means of diminishing water pollution. If such a zone is indeed necessary, it should not be too large because of the repercussions a large zone may have on the communities. The resettlement of a few may not pose any problem, the displacement of a large number may be overwhelming. Where problems may not now exist, regulation of the security zone may rupture the socio-political structure of an entire community.

In the Mandara Mountains, the chief of the village lives at the summit of his mountain and the father lives above the sarés of his sons. If a zone of over 30 meters is enforced, then some chief's saré may have to be displaced leading to a loss of control over his village. In the descent to the plains, although common today, the last to move or to consider moving is always the chief.³⁰

³⁰ Many examples exist of how a chief would be the first to build a compound at the foot of the mountain for the purpose of encouraging his people to descend but he himself would come down only for official meetings with the Prefet or Sous-prefet, never abandoning his mountain compound. Typical examples are the Canton chiefs of Wazang and Douroum.

Specific examples of such cases of disruption would be site 19 at Gouley and site 130 at Moundoukwa. At site 86 at Soulede, site 28 at Wazang and site 125 at Ouda, the reservoir would displace a large percentage of the population. Although not affecting the chief's sare,³¹ it would make him lose control over his villagers.

The third problem relevant to community disruption would be the existence of religious and sacrificial sites where the dams are supposed to be built. Only two such cases of the 21 sites visited seem to fall within this category. These are site 14 at Metcheked and site 99 at Dalan-Serak. It is in Metcheked that the situation could be critical for the dam wall would destroy ancestral sacrificial altars. Traditionally, they can never be placed elsewhere and if displaced lose their significance and may even cause misfortunes and deaths among the villagers. Even if water is said to be the first of considerations, we cannot minimize the implications that the destruction of such a ritual may have on the community.

The second site, 99, is marginally affected although it is also in the very heart of a sacred site. The difference is that the altar

³¹ In a health report requested by the World Bank, Dr. Pabot du Chatelard, of the Center of Endemic Diseases of Mokolo, recommended that a security zone be set at 150 m. ("Etude à propos de la création de dix barrages collinaires dans les Monts Mandara" p. 6, ND, February 1976). Having asked Dr. Pabot what led him to determine such a zone he admitted that it was arbitrarily set, and that it was only an ideal suggestion to be considered. If we do agree with him for the need for a security zone we do not think that it is the ideal that should be considered in this case but rather what is most realistic in relation to the community involved.

which belongs to two neighboring communities (Serak and Dalan) will not be touched by the construction and is high enough on the rocks so as not to require its destruction or displacement.

While sacred sites exist everywhere, none of them are within the reach of the dam except for the aforementioned.

B. Participation in Dam Construction

Local participation in the construction of the dams does not appear to pose any problem in the villages visited. Indeed, as cited above, villagers willingly participate in communal projects within the village, such as well-digging, small dikes, harvesting, house building, etc. Other communal projects are initiated by the local administration (sous préfecture) and are part of the general yearly "human investment projects" of the villages. Such routine jobs are known as "corvées" which were established by the colonial government and continued after independence with the assumption that avoidance of such participation would lead to some sort of punishment, imprisonment or fine. "Corvées" are used to build or repair village schools, to maintain public roads and government buildings. For the purpose of our investigation, the knowledge of such participation was an indication of the level of awareness and willingness to participate in the dam works in general.

Enthusiasm was general when discussing the participation of the villagers in their future dam construction, especially if it takes place during the dry season. All know what types of jobs they would do,

and many, especially the young, expressed the desire of learning how to mix cement and become masons so as to better build their own compounds. Attitudes varied, however, in relation to specific questions relevant to paid versus unpaid labor, hiring procedures, and women's participation in the construction.

Paid versus unpaid labor brought conflicting reactions among the villagers themselves as well as among the local officials. For most villagers, enthusiasm drastically fell at the idea of unpaid labor. It immediately brought up the parallel with the yearly "corvees" which, though accepted, are always thought of with distaste. Nevertheless, unpaid participation was accepted by a few, especially among the older generation. These elders argued that the advantages brought about by year-round water availability by far outweigh the temporary financial losses. Some local administrators, moreover, felt that paid labor will render the "human investment projects" (i.e. "corvees") more difficult to administer. The argument was that such projects were for the benefit of the villagers and if paid labor was institutionalized, it would be difficult for the government to finance them. These local administrators feared that it would be the beginning of the end of "voluntary" participation. To solve the problem, one suggestion was to give a gift to each participant in the village at the end of the dam construction.

A contrasting argument was presented by other officials. They reasoned that a parallel would be made with the "corvées" and would be a golden opportunity for political instigation arousing feelings

of subservience and exploitation. Paid labor has become a part of the village economy. In addition, knowledge of paid participation in recent dam constructions (Djingliya, Mokolo, G.T.E., Yagoua and Semry II) has spread throughout the entire region. Therefore, it would not be wise to suggest that labor be unpaid and, furthermore, it is doubtful that voluntary participation would be as effective.³²

Notwithstanding the political implications, paid labor will also affect seasonal migration to urban areas by curtailing it and, hence, relieving temporary unemployment and helping to acquire or improve skills.

As suggested by some village chiefs and local administrators, unpaid labor could be organized through systematic rotation of villagers in a wide circumference of villages around the dam, thereby alleviating a lengthy burden of a "co-vée". Others suggested a similar system could be set up for paid labor, spreading, though thinly, the economic benefits of participation. In these cases, the effect on seasonal migration would be minimal. However, if some villagers within a defined perimeter are involved throughout the construction, the effect on their seasonal migration would lessen, even if it reaches only a restricted number of families and for just one season.

³² The SOGREAH report, op. cit part III, p. 67, brought up the problem of the inefficiency and lack of enthusiasm of unpaid labor in the construction of small dams built in the Mandara Mountains by the BRGM in 1967.

Hiring of unskilled labor can be done in two ways: (1) hiring local labor through the Canton Chief (even if this means going through the local administration), thus limiting hiring within the confines of the canton in which the dam is to be built or (?) going through the employment bureau of the local "sous-préfecture", consequently widening the perimeter of employment and hiring anyone qualified for the job. Each procedure would have different implications for the villages concerned. In the first instance, employment, even if limited, would not only be of immediate economic benefit to the villagers but would create an identification with the dam itself, a psychological effect of great importance when the time for maintenance comes (a burden which they will have to bear). In the second instance, the benefits would go to the unemployed in general, even those from the urban centers at the risk of excluding villagers from working on their dam which may lead to a loss of identification with the dam and thereby becomes another "corvee". Moreover, it would limit the chances of upgrading local skills by bringing in, for purposes of convenience and speed, skilled labor from the cities. In the first procedure, local skills would be sought out first before going out of the community involved.³³

The paid participation of women in the dam construction gave rise to a variety of reactions, the most common being one of surprise. Their participation was not rejected after reflection. It was

³³ This implication is in direct contradiction with the recommendations presented in the SOGREAH report, ibid p. 67, in which all skilled labor would come from urban centers.

admitted that women who are used to carrying water and wood, could well perform the jobs during construction and could also carry sand. Husbands would be happy to see their wives earn money. But this financial benefit was sometimes seen differently. The women's economic gain would come from the little commerce that would mushroom around the construction area: e.g., selling of food, snacks, drinks, cigarettes, etc. However, the husband's consent would be necessary and it was often said that her participation in the dam construction should not affect her family responsibilities. In a specific instance, at Tourou (site 135), where unmarried young women frequently go to urban areas, whether in Nigeria or other parts of the north of Cameroon, to seek work,³⁴ it was generally said that only these young women could participate and that it would be impossible for married women to "waste their time" on other than household activities.

It seems apparent that a few problems will arise in the choice of sites or in the hiring mechanisms for the construction of the dam, if consideration is taken in avoiding displacement of either sacrificial sites or a large number of sarés and if participation of villagers concerned by the first hiring objective, with the assumption that paid labor is the norm. As for the participation of women, a family instability may arise because of the difficulty in reconciling time needed for their daily routines and the time spent on the dam. The general feeling was that family stability outweighed financial gains.

³⁴ In the case of Tourou, it was maintained that some fathers would send their daughters to work in urban centers in order to help in the payment of taxes.

PART III

THE DAMS IN USE

The major benefit from the village water supply component would be an improvement in the quality of life for ... rural families. The project would improve water quality and thereby contributes to reducing health hazard, increase daily overall availability from 15 to 25 liters per capita, and greatly reduce the burden of carrying water over long distances, a particular benefit to rural women.³⁵

The basis of this study is to determine to what extent these benefits apply to each of the sites visited. This part is divided into four sections: Section A, on the usefulness of the dam, will attempt to deal with problems that may arise in relation to theoretical versus real perimeters of influence of the reservoir. It will also deal with the reasons for the villagers' choices of either water from wells or water from the dam. The choices may bear some influence on the ultimate construction of the dams and suggest alternatives to dams when necessary. Section B will be a discussion on questionable sites encountered in the field and suggested solutions. Section C will deal with the mechanism of maintenance of the dams and attitudes towards this maintenance; finally, Section D will highlight the social and human benefits of the dam, that is, its impact on the community and the beneficiaries most concerned.

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IBRD, p.iv, para xii.

A. Usefulness of Dam

The SOGREAH report³⁶ bases the usefulness and utility of the dams on two perimeters of influence of 2.5 kms and 5 kms respectively. Within each perimeter is a number of sarés, varying with each site which would benefit from the dams, 100 sarés being the minimum considered. The above peripheries given are an ideal standard set as a method for measurement³⁷ which in no way coincides with the reality of the topography because the measurements correspond precisely to geometric circles made on the map.³⁸

The problem in relation to the theoretical perimeters established is that it oversimplifies the criteria of water accessibility, i.e. reducing distances to fetch water. There is no doubt that distances will be diminished often, however, the theoretical perimeter grossly belies the topographical obstacles in the entire region.

Although this point is raised, it in no way minimizes the overwhelming importance of the dams or of the number of households to be served by the reservoirs. On the contrary, it highlights the reality of the topography not made explicit in the SOGREAH report. The report has included an important number of sarés which will not benefit from the dam. The women will prefer going to their

³⁶ SOGREAH report, Part III, pièce C1, p. 20.

³⁷ In private conversations with SOGREAH engineers, they indicated that such an ideal was maintained for a twofold purpose: (1) as a convenience for measurement and (2) with the assumption that the dam will encourage new settlements. As will be seen from our discussion in the text this last point cannot be confirmed in all instances from our findings.

³⁸ See Annex II: example of map site indicating real radius of influence of one site.

traditional water sources, even if the water is stagnant and green with pollution, rather than spend the time and especially the energy of climbing and descending a mountain to reach the dam. All the women interviewed unhesitatingly said that they would rather walk 3 or 4 kms in the plains than walk 1 km in the mountains with their filled waterjug of 10 to 15 liters balanced on their heads or shoulders.

This reaction is of great importance because it reveals the loophole created by the theoretical perimeters. A significant portion of the population beyond the mountains of the dam would not be able to get to the dam. In this case, there is a real need of extending additional water sources to those not within the real perimeter of the reservoir.

Topographical obstacles are not the only hindrances to a wider and more effective use of the dam waters. Another aspect of the SOGREAH report is the inconsistency in indicating traditional water sources (wells or mountains springs which are permanent in the area).³⁹ These sources of water which may be closer to the women's houses than the dam will discourage them to walk an extra 500 meters

³⁹ In spite of the fact that in Part III, Pièce C-1, p. 64 (para 5.3.1) of the SOGREAH report it is noted that the site maps indicated existing subterreanean water within the vicinity of the dams, our own investigation in the 21 sites brought out inconsistencies. A typical example is site 136 at Ldingding. Traditional water sources important to the population and within the theoretical perimeters of the maps are also frequently missing, such as in site 19 at Gouley site 28 at Wazang, site 154 at Ngossi, site 129 at Magoumaz and site 135 at Tourou.

even for the sake of cleaner water. These attitudes are important to acknowledge and understand so as to acquire a better assessment of the need for a more complete and more useful water resources component in certain areas.

The reduced distances for fetching water was not the only advantage greeted with overwhelming enthusiasm by both men and women interviewed. The possibility of also having an all-year-round pond of water sufficient for everyone in the village was met with even greater appreciation. It is how this water is to be fetched and used that differences of opinions and attitudes were brought out revealing the effect of traditional methods of drawing water (as mentioned above) and their implication on the use of the dam reservoir.

It was thought by all that it was most natural to continue using the traditional methods in the water drawing by those who will use the dam.⁴⁰ Both methods, however, will create problems in the ultimate fetching of the water. The method of digging a hole next to the "mayo", said to be continued with the dam, cannot be continued in most cases. The dam shores are rocky and will make it impossible to dig a hole next to it. In such cases, the beneficial traditional filtration of water would be destroyed by forcing the people to fetch water directly from the reservoir leading to uncontrollable pollution. Indeed, the villagers showed great misgivings at this change of method, either because it was realized that it would not be healthy or because it was merely inconceivable to change such a habit.

⁴⁰ See Part I, C of our report.

The second method of drawing water directly from the "mayo" was also said to be continued once the dam water exists. While change of method could not be conceived as possible by this group as well, the impact of their tradition on the dam water is far more serious because of their complete unawareness of the possibility of pollution. While these traditional methods of fetching water differentiate one group from another, a common habit to the entire region is that of allowing animals to drink from the same water source as that destined for people. This habit would be continued and the possibility for pollution of the water would be very much increased.

Moreover, the use of water to hand irrigate small gardens or rice paddies next to the banks of the reservoir was very often brought up and thought of as of great benefit to the subsistence of the family. It is undeniable that such would be valuable for it would introduce new and nutritious vegetable into the people's traditional diet. Yet, here again, centers for pollution would be encouraged and the ultimate value of the water destroyed. A further polluting factor, though caused by nature, will be the rains that will fill the dam. Coming at great speed from all sides of the mountain, the rains will gather along the way the inevitable refuse and carry that into the reservoir. The danger of this is not only unavoidable but too obvious to even dwell upon.

The two methods of drawing water, animal use of water, hand-irrigated cultivation, the accumulation of rain waters, all make it necessary to find solutions which would avoid, or at least

alleviate, these negative effects on the reservoir. A solution common to all these impediments would be the construction of wells with a filtering system linked to the dams. A solution to be seriously considered in spite of the problems raised in the SOGREAH report.⁴¹ The people would, therefore, have no choice but to use the wells both for their personal use and for their animals; in the latter case, place this water in a simple trough from which the animals would drink.

While wells linked to dams are a solution to water pollution, wells independent of dams should also be installed as a solution to water accessibility in the areas outside of the real radius of influence of the dam.⁴² As already discussed above, a large portion of the population would be unable or unwilling to reach the dam.

⁴¹ In SOGREAH report Part III, C1, p. 33.

⁴² In the discussion below, p. 41 on the site of Gouassa (Mogodé) the importance of distance over that of abundance or cleanliness of water for the villagers destroys the generally held belief that the dam would automatically attract a large number of people. Another most interesting example though it does not relate directly to the construction of a dam concerns the existence of a very beautifully constructed well in the village of Haa, on the borders of the Cantons of Mogodé and Guili. In this case, a well with a watering trough was built around 1970, about 100 meters from the main road, next to a small cluster of compounds. The very purpose of the well was to attract the construction of compounds of mountaineers descending to the plain. However, today, the well is entirely abandoned, stagnant and surrounded by ruins. The compounds of the village are clustered at a distance of 500 meters from the well. The original sarés and the new settlements moved to a different location. Social ties were more important to maintain in the new environment as water already existed all year round in the mayo behind the village. This is a striking example of how a social factor overcomes the importance of health considerations and convenience of cleaner water.

To shorten their distance for fetching water, the installation of such wells should be seriously considered if the objective of the project as a whole is to lessen for villagers the burden and shorten their distance to water.

B. Questionable Sites

The solutions linking wells to dams and independent wells outside of the real radius of the dam apply in all cases where the dams are to be retained. However, among the 21 sites visited certain problems were particular to nine dams. Each dam will be discussed separately and suggestions for a hopefully better alternative will be attempted.

Sites to consider eliminating. No. 18 at Molkoa, No. 156 at Choua, No. 25 at Mokong, No. 110 at Oudahay and No. 129 at Magoumaz.

Sites 18, 156 and 25 have a strikingly common feature: no population lives in, close to, near, or within a meaningful radius of the projected dam.

It was at the Mokyo-Molkoa mountain (of site 18) where the first government program of forcing the descent of the mountain peoples took place in 1963.⁴³ Today, no one remains on the mountain except for a lone saré facing the dam site. Ruins and abandoned fields are seen along the way even though a few fields still seem to be cultivated.

Here, as in site 156 of Choua, it would be an utmost loss of time and money to build a dam for it is quite out of the question for the population to even consider moving back up to the mountain. An

⁴³ See Boutrais, pp. 60 and 167.

important though old study has been done on the water table of Mokyo⁴⁴ and would probably be of importance in the consideration of constructing either a series of wells in the plains where water is not abundant or a small dam (in the plain) for the use of the now long-settled villagers.

Choua was also part of the 1963 resettlement program and is today an even more desolate area than Molkoa. The present Canton Chief of Guili himself confirmed his own participation in this program and strongly stated his opposition to force his people back to the mountains. It would be "playing with their lives," he said. In fact, the people of "Old Choua" have all resettled along the main road and most are now in "New Choua." In the case of "Old Choua" (site 156) the elimination of the dam is also obvious but because of lack of water and very few wells in the Canton of Guili - which has a dense population of 11,000 inhabitants - it would be most appropriate and far more useful to install instead a series of wells throughout the Canton.⁴⁵ Indeed, if we are to consider the theoretical perimeter of 2.5 kms, a village falling within this radius, placed behind the mountain of the dam and the closest one

44 D. Martin, Etude Pédologique du poste de paysannat de Mokyo, I.R.C.A.M., Yaounde, 1960, 17 p. multigr. (ref. from Boutrais Ibid, p. 169 to 276).

45 Individual families at Guili have attempted to build wells for their own personal use. However, as Father Romain of the Catholic Mission of Guili confirms, as soon as the people hit water, at 6 or 7 meters, they stop digging, making the usefulness of the well very limited. The main problem here is the lack of equipment that would enable the people to dig deeper into the water table.

to the site, is gradually and steadily moving towards the road and away from the dam site. The example of this village behind Guili is even more pertinent because it is barely a kilometer inland from the main road and it has enough permanent water sources in the village, two of which were, in fact, dug by the villagers themselves.

Mokong (site No. 25) is the third site which was included in the massive resettlement of the mountaineers in the plains in 1963.⁴⁶ From our own preliminary observations, the area of Mokong is densely settled in the plains. However, because of our possible mistake in locating the exact site, we are unable to be completely definite in our recommendation. On the other hand, an interesting discussion with the Canton Chief of Mokong brought up another possibility. The area of Mokong is divided into two by the River Tsanaga, north and south of it. Not one site south of the Tsanaga has been considered in the SOGREA report. It appears that a dense population still lives in the mountain south of the Tsanaga and distances to water during the height of the dry season can reach 15 kms roundtrip over several mountains. It is therefore suggested to cancel site 25 and reconsider a new site south of the Tsanaga. If this is impossible, from an engineering point of view, a series of wells along the Tsanaga, rich with water, should be installed.

While sites 110 and 129 present a different problem from the ones identified above, they should also be eliminated. A very large dam is presently being completed 15 kms north of Mokolo and is known as the G.I.E. (Grands Travaux de l'Est) dam for the purposes of servicing

⁴⁶ Boutrais, p. 60.

Mokolo with water. This dam, whose wall is 200 meters wide, has forced the displacement of whole villages and destroyed part of the surrounding mountains. One of the villages affected is Oudahay and the GTE dam waters will cover, when completed (goal being July 1978) the dam site No. 110. This site is, therefore, naturally eliminated.

The village of Magoumaz (No. 129), will also be affected on its southern flank by the GTE dam. However, the suggestion of its elimination is based on another consideration. The dam site would be placed very far from the majority of the population which goes during the dry season to the mayo Moskota for its water. The wait is long and tedious and deep wells with year-long water placed at the foot of the mountain and on the plain would be of immense value to this part of Magoumaz where year-round water sources are available. ⁴⁷

Dams which should be relocated are at Sites 136 at Ldingding, 140 at Gouassa (Mogodé), 153 at Sirakoutou and 14 at Metcheked (Douroum).

It is, of course, impossible for us to recommend technical options for the relocation of the dam sites mentioned above. In discussions with the SOGREAH engineers, it was firmly stated to us that it would not be possible to relocate these dams. However, as engineers may

⁴⁷ See J.Y. Martin, p. 21. In his discussion on the hydrography of Magoumaz, he notes that certain mountains of Magoumaz are favored with year-round sources of water (certainly the mountain which we visited) while others are devoid of any water during the dry season forcing women to walk 7 kms to the mayo to fetch water.

differ in their opinions as social scientists do, we suggest that engineering considerations be reviewed, especially in relation to sites 136 and 140.

At Ldingding, near the Nigerian border, site 136, the dam would be of minimal value to the surrounding population. This area has year-round sources of water, not only in the dam site itself, but one kilometer away, where two traditional wells and one mountain spring exist centrally located to the population. Further east, the heavily populated village of Matsaghal has severe shortages of water. However, it is in a mountainous area which may well allow the construction of a dam. The villagers of Matsaghal who are within the 2.5 km perimeter of influence set by the SOGREAH map frankly consider it absurd to expect them to climb several mountains to get to the dam with their waterjugs. They saw the value of the dam during the dry season, only for their cattle which they have to take over the Nigerian border during that season to give them water. Moreover, the villagers of Ldingding who would benefit most from the dam would not descend willingly if their water sources were not dry. Due to the extreme dryness of the area and difficulty of digging wells, a dam would be more useful than wells at this site. Nevertheless, a more useful choice of site for the dam would be of far greater socio-economic importance and have a more positive impact on the energy spent by the villagers.

Site 140 of Gouassa (Mogodé) is reminiscent of the abandoned sites. This entire Kapsiki population is very definitely resettling in the plains along the main road, as in Choua, and many ruins can be seen

along the way to the site. Part of the mountainside of the dam is, indeed, inhabited. However, there are, in all, 15 households who will be the sole Cameroonian users of the dam which is literally on the Nigerian border. The Canton Chief of Mogodé believes, as we do, that those on the other side of the border, i.e. the Nigerians, will be the real beneficiaries of the dammed waters. Upon the urgent suggestion of the Canton Chief, we visited the hamlet of Oula as a possible alternative site, more centrally located. If such a site is not technically feasible then it is strongly suggested that very deep wells be installed on both sides of the road to Mogodé as it is such a densely populated area.⁴⁸

At Sirakoutou, two potential sites are indicated in the SGGREAH report. Site 153 retained and site 137 not retained because of the three following considerations. (1) Water volume is too low; (2) the cost would be too high and (3) the proximity to site 153 eliminates its value.

However, in relation to social factors and the impact on the human energy involved, Site 153 is too far from the needy population and less than one-tenth of the villagers would go. They would rather wait by the mayo than climb up and down to the dam. The non-applicability of the theoretical 2.5 km perimeter is very obvious in this

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It is in this village that exists the commerce of water sold in the multi-colored "pousse-pousse" (see Part I, C, p. 19). Vegetable gardens, for commercial purposes, are also common and the produce is sold as far away as in the market of Maroua, besides Mokolo, Roumsiki and the hotel in Roumsiki.

site for within this perimeter, Roufta, a large village south of Sirakoutou is included in the SOGREAH map. Yet, a walk and a visit with the villagers of Roufta, those sections of the village theoretically closest to the site, felt that they would not seek water at Site 153.

If the goal of the proposed project is to bring water to the people, to shorten the distance to water, to alleviate the fatigue and to reduce the long wait to fetch water, then there can be no hesitation about which choices should be made. In the outspoken words of the Canton Chief of Mogodé: "If you came here to help us, then you must know and understand what we need, otherwise it will be a waste of money for you and a waste of time for us." At Sites 136, 140 and 153, such an argument is almost a sine qua non.

As it may be recalled,⁴⁹ the only site visited which involved the destruction of a religious altar is Site 14 at Metcheked (Douroum). Because water is greatly needed in this area, recommendations for the elimination of the dam for the sake of religious considerations is difficult to make. However, it is suggested that, if possible, the avoidance of the destruction of the enormous sacrificial altars be seriously studied and that the dam wall be placed before these altars and the small woods surrounding them.

Four important conclusions emanate from the above presentation:

(1) The dams will not automatically attract a population that has already descended or is gradually descending to the plains where

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See Part II, A, p. 26

they have greater access to modern facilities, health centers, schools and roads.

(2) Water accumulation is not as important a consideration as the energy released, i.e. the effort spent in getting to the water, therefore, greatly diminishing the utility of several dams.

(3) The importance of studying each dam site separately and as an independent sociological unit is of utmost necessity. Since, out of 21 sites visited, nine led to a certain amount of modification of the original proposal because of social factors, it is important, therefore, to insist upon the need of following up with a similar study for the remaining 26 sites.

(4) The reconsideration of the appropriateness of some of the dam sites mentioned above was a direct outcome of the unrealistic and too theoretical perimeters established by the SOGREAH report.

C. Maintenance of Dam

The construction of the dam cannot be an end in itself. A far more difficult social problem is the maintenance of the dam and of the suggested wells linked to it. It is the success of a smooth maintenance routine that will make the dam truly useful by bringing potable water to the population.

There are two problems that are related to maintenance. One is social and the other physical. Solutions to the first problem will rely on socio-economic aspects while the latter revolves around technical considerations. Attitudes in relation to the use and

maintenance of the dam as held by the people will very largely affect the problems and their solutions.

The immediate social consideration in the maintenance of the dam is to curtail the pollution created by men and animals. As already indicated, it is customary for animals to drink from the same water hole used by the people. However, it was only upon reflection that some villagers agreed that it would be best to prevent animals from directly going to the reservoir. It was firmly held by most that children should be prohibited from playing in or near the water as it would be forbidden for adults to bathe or wash in the reservoir.

Two suggestions for the enforcement of such prohibitions are worth adopting: (1) the choice of a local guard, preferably a married adult,⁵⁰ and (2) the building of a strong thorn fence, easily found

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One cannot expect that auto-control be sufficient in maintaining the prohibitions necessary for the use of the dam. In a discussion with the representative of SNEC at Mokolo, it was indicated that during the two years when the dam at Mokolo had no watchman, incidents of violation by cattle and people in the use of the dam were frequent. This led the SNEC administration to realize that self-discipline was not enough and they hired a full-time watchman.

In most traditional societies, social and auto-control are the most effective mechanisms to limit various social and psychological deviances that may aggress either family or group; taboos are maintained, individual or group punishment is permitted, social isolation leading to effective social death - is not uncommon in individual cases. However, such socially-determined control is within the traditional context. As soon as a "modern" factor is introduced into the tightly-knit tradition web, the social and auto-control rarely even applies. This is not only true of underdeveloped countries but of developed countries as well. A significant example common to both types of societies is the breakdown of respect between the generations **and consequently, the loss of control of the elders over the youth.** If even less than 50 years ago, a chief in traditional Africa could

(Footnote continued on next page.)

in the entire area, surrounding the whole dam.

The role of the Canton Chief is very important in the application of these suggestions, especially if the dam happens to be in the village in which he may be living. Otherwise, he delegates his responsibilities to either the village chief or hamlet chief most directly concerned by the dam.

Preferences on the choice of watchmen often brought colorful discussions. Young men were excluded from the choice because they were "womanizers" and also drank at all times of the day with their friends. Old men were also rejected because of their inability to impose themselves on the young and on their incapacity to resist early morning and late evening cold (for it sometimes gets extremely cold in that region). They were also considered not strong enough to beat those who would disobey them or run after the children. In general, the choice settled on a married adult, considered to have a sense of responsibility, and "who doesn't need to run after women," who is known and respected by the villagers and healthy enough to resist cold as well as the pranks of youth. The choice would either be the sole responsibility of the Canton Chief himself, or made in a general meeting with the villagers concerned and in accordance with their desires.

never be chosen, except for extremely rare cases, but from the group of elders of a village, today, in Northern Cameroon, as elsewhere, there are Canton Chiefs (positions more important for the daily and secular life of the people than the Master of the Rain) who are between 25 and 35 years old ruling over large populations. Moreover, formal education and migration which have reached the remotest parts of the mountains have added to the breakdown of the traditional society. Cohesion and respect to the group and to its property through social and auto-control is frequently but an ideal

The real problem for the villagers was whether to pay the watchman for the dam a regular salary or whether the watchman should be a volunteer. The consensus, including that of various chiefs of the cantons, was that the watchman would have to be paid if he was expected to guard the dam with seriousness and regularity. Who is to pay him and how much (probably about 5,000 CFA per month) rested on the decision of the government or local administration but it was felt that the community could not bear such a regular financial burden which, indeed, is an obvious reality. The average income of the 170,000 inhabitants of the Mandara Mountains is far below the per capita GNP of \$290 a year for it does not go beyond an estimate of \$50 per annum.⁵¹

We suggest that regular positions for watchmen be established within the various sous-préfectures. The beginning of construction would be an opportune time to create these positions and select the watchmen from within the villages. It is logical that the position of watchman could be kept on a permanent basis once the construction is completed.

A complementary approach that would help enforce the prohibitions against the direct use of the reservoir would be to encircle it with a fence of thorns. Not only would this be a very effective way of restricting access to the dam and make easier the surveillance of the site but it would be the most practical method of fencing as the material is very common and abundant in the Mandara Mountains. Indeed, thorn fences are used by the farmers to protect their small

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See PID, pp. 1 and 5.

vegetable gardens. The fencing of the water could be a local activity in which men, women and children, if need be, participate. However, the dam should not be considered as complete before a thick thorn enclosure is set up. The checking and maintenance of this enclosure should be included in the watchman's regular duties along with routine cleaning of refuse and weeds in the dam.

Physical factors are also involved in the problems of the maintenance of the reservoir: sand silting, growth of weeds and the accumulation of refuse. One way of limiting these problems, which may have negative health repercussions, is to establish a minimal security zone, as mentioned above (see page 25), in which the villagers would not be allowed to cultivate their fields, build their sarés, wash or bathe. An engineer of the Génie Rural of Garoua said that by allowing a permanent wild vegetation on part of the mountainside, sand that would otherwise rapidly fall into the reservoir with the rains may be slowed on its course down the mountains. Whether such a suggestion is technically realistic is not possible for us to assess. However, in its discussion of cost recovery of the sub-project of small dams, the World Bank report brings out two important socio-economic aspects related to the physical maintenance of the dam. They are local participation and/or added taxes on the local communities for the necessary yearly upkeep of the dam:

In the small dams sub-project, the maintenance cost of the dams would be covered by the beneficiaries and their communities. The beneficiaries would provide voluntary labor, or alternatively the equivalent cash amounts, required for periodic cleaning and weeding of the reservoir; local communities would make adequate appropriations to cover other related monetary expenditures. Typically, maintenance of a dam would require about 500 man-days per year for reservoir cleaning and weeding and about US\$1,200 for other monetary expenditures. To meet such monetary expenditures, a local community would have a choice based on its priorities of deferring or curtailing other budgeted expenditures or raising additional taxes.⁵²

Voluntary local participation of beneficiaries of the dam can very well be envisaged when it comes to the routine of periodic cleaning and weeding of the reservoirs. These duties, which may involve many hours (500 man-days in all), could be done by the villagers, and initiated or organized by the village chief, for their dam, thereby creating a greater sense of responsibility for the maintenance of the structure as a whole. Maintenance duties can only be performed within the technical capacities of the villagers. It cannot be expected of them to drain the reservoirs⁵³ or clean the walls periodically without special training, thus, implicit paid labor.

We cannot assume that the Génie Rural (RES) of each area can be responsible for large maintenance works as their means and capabilities as confirmed by their engineers, are extremely limited.

52 IBRD report, p. 17.

53 GTE engineers indicated that the small dams will have to be emptied once a year for a period of three to five years.

Numerous wells throughout our trip were found either clogge or polluted because they have never been maintained in spite of the repeated requests from the village chiefs and the Canton Chiefs.⁵⁴ A concrete solution to the technical and financial problems of the RES responsible for the dam should be seriously considered within the provisions of the project. From the sociological perspective of this study, the impact of more effective and regular services rendered by the Génie Rural would have an enormous beneficial effect on the villages and the life span of the dam (if not also of the villagers themselves.)⁵⁵

As for the added taxes to be levied on the local communities to meet the necessary maintenance expenditures, it is difficult to see how villagers, with an average income of \$50 per year, who now need a whole year to save enough money for their already relatively heavy taxes, could meet an additional burden. If the burden of maintenance of each dam (an estimate of \$1,200 or the equivalent of 300,000 CFA) is to be the responsibility of the users of the dam, it will be extremely

54 A general summary on water problems in the underdeveloped world indicates, "From our own experience and from the literature research, it is quite clear that about 50% of the water taps seem to be out of order after three to five years." OCED, Development Center, p. 1. Though reference is made here to water taps, this can be very pertinently applied to wells and pumps in Northern Cameroon in general.

55 Both an economic and technical analyses on the present state of expenditure needs and professional and material upgrading of the RES of Maroua and Mokolo, those services most concerned with the dams should be undertaken. If such an upgrading is not included within the budget of the Water Resources Project, a follow-up project would not be expedient enough to make maintenance meaningful. It would also endanger the very usefulness of the dam.

difficult to determine how many hamlets are actually involved, as our discussion on the real perimeters indicates. Moreover, as the number of beneficiaries has been greatly diminished in relation to the theoretical perimeter of influence, the estimated tax per head of family would be greatly increased. In every case the dam will service less than 300 sares and the added taxation may be well over 1,000 CFA for each family, thus, almost doubling their present taxes of 1,300 to 2,300 CFA. If some villagers, because of their proximity to urban centers, could bear that added taxation, it is not so with the majority who are literally struggling for their survival. We have witnessed children who are not sent to school because their parents cannot afford to buy the necessary clothes or even copybooks. No matter how minimal the taxation, it would be a severe hardship.

If the upgrading and improved financing of the RES cannot reduce the taxation of the Mandara Mountains peoples, then a different solution must be sought, before seeking, as a very last resort, an increase in the negative taxation on a population which would already be asked to voluntarily participate in routine maintenance activities necessary for the upkeep of the dam and well.

The above discussion on maintenance had the aim of highlighting the following major problems: (1) the institutionalization of a permanent watchman for each dam, (2) suggested upgrading on the RES of Northern Cameroon; this is essential if the dams are expected to last; (3) the inability of the beneficiaries to pay for

maintenance and cleaning beyond voluntary participation in routine maintenance.

One last point should be added here in relation to the existence or creation of water users associations for the regulation of the dam waters. Such organizations cannot be established anywhere in this area, especially if the radius of the dam's influence spreads over several hamlets or villages. These water users associations would be highly artificial and meaningless in context of the socio-cultural structure of the society. It is through the organizational responsibilities of Canton Chief or village chief that water use regulations can be meaningful: first, through the choice and hiring of a watchman for the dam who would enforce the rules, and second, the organization of voluntary participation of the villagers for the maintenance of the dam, particularly during the dry season.

D. Impact of the Dam

The impact of the dam will be immediate and doublefold. A primary impact will directly affect the main beneficiaries of the dam --women -- and have temporary economic benefits on the locally-hired labor force but a very positive long-term effect on the continuous capacity for agricultural production. A series of important secondary benefits will be seen in an improved diet, improved livestock because of water access and abundance, positive but also negative health implications to be seriously considered, increased value of land and curtailing of migration to the plains. Effects appear to be minimal, however, on the children's school attendance.

Primary Impact:

Women are the main beneficiaries of the dam. As mentioned earlier, during the dry season, women spend half of their waking time fetching water and most of this is spent walking to the water holes and waiting in line to draw the water. The dam brings not only a continuous abundance of water, therefore, less wasted time, but also, in many instances, shortens considerably the distances to walk, i.e. less fatigue. With more time and energy gained as a result of the dam, the women's general well-being will inevitably blossom. As most of them declared, they will have time to rest, thus, take better care of themselves, of their children and their households. Their husbands would also greatly benefit because it is during the dry season that they are most neglected and their meals most irregular - a common complaint from all men. This was frequently the men's immediate thought of how they will benefit from more accessible water: their family life and family meals would be more regular.

A surprising number of women, however, thought of economic benefits in relation to the dam. With more time on their hands, they would be able to weave more baskets and sell them, cook fried cakes which they would sell in the market or, in the case of the blacksmith's wives, have more time to make their pottery. With more money (which is always the woman's property as long as she earns it) many of the women thought then of being able to have their millet ground in the village mill, if one existed, or even take it to the

closest village or town with a mill. The time and effort spent in the daily chore of grinding millet or sorghum is indeed very great. This activity requires almost as much energy as fetching water.

The ability of the women to better use their time and energy, whether to rest, work outside or take care of their household, can but lead to greater personal stability, better health and ultimately, greater social benefits. These benefits would include time for small commercial activities and healthier interpersonal relationships by diminishing tensions among women around waterholes and within the family during the dry season.

Men are also beneficiaries of the reservoir's abundance. It is at the end of the dry season and before the first rains that the farmers must begin to prepare their fields. This is an extremely arduous activity made more difficult by the shortage of drinking water. The easy access was said by farmers to be essential in helping their work in the fields. As with the women, their fatigue would also be relieved and their loss of time greatly curtailed by this easy access to water.

The first impact of the dam, in whatever region it will be built, will be felt at the time of construction when local labor will be hired for the dam works. As it is planned to undertake construction during the dry season, the most difficult time for the men's economic survival, the dam works will become an attraction for many who normally go to the urban centers for temporary labor. This will most certainly curtail the exodus to the towns for at least one season.

Secondary Impact

Nutritional benefits will be gained from added agricultural activities. Small vegetable gardens, if not also fruit gardens, will be cultivated. Indeed, such gardens have sometime been noted where permanent water holes exist (as in Mogodé, Gouley, Wazang) and many farmers, both men and women, have indicated that they would be encouraged to cultivate such gardens if water is easily accessible from the dam. A particularly obvious example of a new agricultural activity linked to the existence of a small dam is that found at Djingliya. Rice paddies, belonging to 13 farmers, have been cultivated at a short distance below the dam where water seeps enough to allow such cultivation which is very new to the area. Although the rice paddies are a potential breeding ground for snails, and hence a health hazard, one must appreciate the initiative shown by these farmers.

Fish also exist in the Djingliya dam and small children fish there. However, it would be far more interesting if a serious pisciculture project linked to the dam be designed. There would be no problem of including fish, already known, in the traditional diet but scarce all year round.

Livestock will directly benefit from the water regularity and abundance, especially during the dry season. By more frequent watering and great reductions in distances to reach that water, the general health of the animals would substantially improve. Their owners would also benefit by not only eating better meat, therefore,

adding to their own nutrition, but by also adding to their economic gains by selling better quality livestock in general.

The health impact of the dam waters will be both positive and negative. In its positive aspects, the abundance and year-round availability of water will encourage the people, especially during the dry season, to bathe and wash more frequently. In this very dusty and dry area, people cannot bathe more than once a week even though they live close to the ground all day long. Old people, who may have difficulty fetching water, may wash as rarely as once every two or three weeks during the dry season. Washing clothes as well as the body more frequently would have immediate health benefits to all, and most particularly to the children whose resistance to sickness and infection is very low.

The negative aspects of the dam waters are also obvious. Because of the great difficulty in controlling schistosomiasis and other water-borne diseases infections will become even more prevalent than they are now. Unless supervised maintenance is regularly undertaken and wells included in the dam construction, pollution will become inevitable because restrictions of the use of dams will be difficult to enforce. To render the positive health aspects meaningful, the negative health impact must be overcome.

A secondary, though maybe marginal impact of the dam, is the relationship between value of land and proximity to water. This relationship was often mentioned but, in effect, what gives land its real value is its known fertility. Another marginal impact linked

to land is the farmers' descent from the mountains to the plains. The positive impact of the dam in this respect is that it would make life more livable for those who truly wish to remain in their mountains. The goals of the project should in no way be that of keeping people in the mountains, which inevitably would isolate them from the modern facilities. Rather, it should allow a greater number of people the freedom of choosing between mountain and plains.

The impact of the dam on schooling may be more difficult to assess. While it is true that the water burden on children and particularly girls will be greatly lessened with the dam, it seems doubtful whether this will encourage parents to send their children to school. The excuse for the need of the children's help in fetching water was never given as a reason for keeping them from classes. Ironically, one of the factors frequently mentioned, besides the economic restrictions noted above, was that the abundant rains of the rainy season created real dangers for the children on route to school. However, this argument may well have been true prior to 1976 when the school year was held during three months of the rainy season. The school year has been changed so that it avoids the period of heavy rain.

The real reason which may be the basis of the lack of school attendance would be the economic impediments and the traditional reluctance of the mountaineers to send their children to school. The economic factors may be somewhat diminished by the existence

of the dam as mentioned above. However, unless widespread campaigns are organized with the goal of creating greater awareness among the parents of the real value of formal education for their children, a meaningful or substantial increase in school attendance cannot be expected in this area. Time, mobility and gradual acculturation are the keys to greater school attendance.

PART IV

CONCLUSION AND RECOMMENDATIONS

The research for this study concentrated on the relationship between people and water in the Mandara Mountains, on the social, economic and health problems linked to the physical burden of fetching water and on the implications of the proposed solutions to these problems.

Fetching water during the dry season in the Mandara Mountains is an overwhelmingly time-consuming and tiring burden. At the height of that season, women spend half of their waking hours fetching water an average of 3-4 times a day and often have to walk up to 14 kms for water. Because it is essentially the women's responsibility to fetch water, it is an especially trying time of the year for them and tensions in the village and in the home often build up.

Social change and descent from the mountain to plain have not affected either the traditional methods of drawing water from the mayo or increased health awareness among the different ethnic groups. It has brought about, however, a few interesting individual and group initiatives to solve the water scarcity problem. The most original of these initiatives is the commercialization of water in "pousse-pousse" carts in the village of Mogodé.

The need for water in the region is undeniable. Of the 47 dam sites proposed by the project, 21 were visited with the purpose of

finding whether socio-religious and, particularly, displacement problems would arise from the construction of the dams. If a small security zone above the dam is enforced for health reasons, displacement does not seem to present any problem in any of the sites. Only one of the 21 sites visited is in the very heart of an ancestral religious altar and it is recommended that a slight relocation of the dam be considered.

Socio-economic implications emanate from the villagers' participation in the construction of the dam. Enthusiasm in participating in the construction was unanimous but only if laborers are paid and construction takes place during the dry season, when the men are jobless and often migrate to the plains or urban centers for temporary work. If both unskilled and skilled laborers (when available) are hired from the beneficiaries of the dam, the feeling of identification with the dam would be of great psychological value even though the economic benefits would not be immense.

That the dam should be useful and beneficial for the people is a given. Yet, unless certain factors are seriously taken into consideration, the dam's usefulness would be grossly limited.

Nine of the 21 sites visited present particular problems, but five of these nine should not be retained: three sites are in uninhabited areas, one site will be flooded by the G.T.E. dam outside of Moko!o and at the fifth site wells would be more useful than a dam. Because specific problems are raised in almost half of the sites visited, the necessity of a similar social study before

the construction of the dams for the remaining 26 sites is required. Moreover, water cannot be considered as an inevitable attraction to people who have settled elsewhere or who live too far from a proposed dam site.

The success or failure in the regular and efficient maintenance of the constructed dams will be the key to their survival. To maintain cleanliness of the dam, 3 services are necessary: a year-round watchman, the regular and professional checking on the dams and wells by the RES of the region and the voluntary participation of the villagers in the simple routine cleaning of the dams and wells.

In general, the impact of the dam will be of enormous and immediate benefit not only to women, the main beneficiaries, but also to men and children. A secondary impact may be much more gradual but equally as significant as the primary impact. Increased vegetable and fruit cultivation will improve the nutritional level of the people. Moreover, fish in the ponds will have even greater success than the vegetables which are not so easily accepted by traditional taste buds. Economic benefits may result for both men and women through a better use of their time during the dry season. Yet, the most important factor in the construction of the dam will be its health impact. If the known repercussions of a stagnant pond of water are not dealt with immediately the positive health implications of the dam may ultimately be insignificant.

The most important recommendations raised in this report on the sociological aspects of the Water Resources Project in the Mandara

Mountains of Northern Cameroon are the following:

1. The growing shortage of water during the 9-month long dry season renders the project as a whole an absolute necessity for the survival of the mountain dwellers, if not also plain dwellers and the livestock of the area.

In no way does the importance of the Water Resources Project diminish in spite of the conclusions reached contradicting the theoretical perimeter of influence set by the SOGREAH report and the recommendations to eliminate five sites out of the 21 visited because of either minimal or no potential influence. The real perimeter of influence highlighted the real needs of the various populations.

2. The goal of the project is to diminish the distance for fetching water and to make that water more accessible and healthier. Therefore, the following is highly recommended:
 - a. Wells, independent of the dam should be placed outside the real radius of influence of the site so as to reach the number of sarés previously assumed in the theoretical perimeter of influence given by the SOGREAH report. This will render the project more meaningful.
 - b. Wells with a filtering system should be linked to the reservoir to diminish the negative health impact by the direct use of the reservoir.
 - c. For the purpose of practicality, cleanliness and longevity of the wells, a good and strong system of pulleys with nylon cord and metal bucket should be fixed to the wells. In relation to suggestions a, b and c, it should be noted that these would not be added expenses but rather would fall within the proposed budget as 5 out of the 21 sites would be eliminated.
 - d. A strong thorn fence surrounding the reservoirs would be placed so as to prevent man and animal from directly using the reservoir, and construction should not be considered complete without the surrounding fence put into place.
3. The areas visited which have the greatest and most immediate need of water are those North of Mokolo (the Mafa) and

South of Mora (the Podokwo). It is therefore strongly recommended that construction first begin in this area.

4. A significant conclusion from our study is that each of the 21 sites visited brought out sociological implications particular to each site affecting the ultimate use of the water. This underlies the importance of a sociological analysis for each of the remaining 26 sites. An outcome of our field research has led to the recommendation for the reconsideration of nine sites as discussed in Part III, B and in Annex I.
5. Participation by the villagers in construction should be paid and construction should begin during the dry season so that the villagers would not incur harmful losses in their agricultural activities.
6. It is recommended that the hiring of laborers needed for the construction of the dams and wells be generally limited to the confines of the villages concerned. Such a consideration would have psychological implications of greater local identification with the reservoir.
7. Voluntary labor organized from within the villages by the village chief most concerned should pertain to the routine maintenance of the dam, a factor we believe would be facilitated by the already established identification with the dam.
8. To enforce regulations in relation to the use of the dam a position for a paid watchman should be created at each dam. His duties would include manual routine cleaning of the dam and its wells. In no way should his salary be a tax on the population.
9. The following projects associated with the construction of the dams should be considered as they would have an important impact on its general use.
 - a. The needed upgrading of the Génie Rural (RES) of Northern Cameroon for a more professional maintenance of the dams and wells should be an integral part of the project as a whole to make maintenance effective and meaningful.
 - b. Health campaigns should be organized to sensitize the concerned populations of the better and more efficient use of water. It is suggested that medical and nursing students, in addition to local centers, be included in these campaigns.

- c. A serious pisciculture project, linked to both health and nutritional purposes, should be considered.
- d. It is highly recommended that a continuous monitoring assessment study be undertaken during and after the completion of the construction of the first couple of dams. This is a procedure that will be followed by the IBRD Rural Development Plan and should be considered for the AID project as well. It is necessary and useful to assess repercussions in hiring procedure, labor organization, eventuality of displacement of the people and evaluate the successful enforcement of the water use regulations and effectiveness of the watchman for the reservoir. Thus, the assessment would be useful for a meaningful and up-to-date evaluation of the project.

ANNEX 1

LIST AND ITINERARY OF SITES STUDIED*

<u>No.</u>	<u>Name</u>	<u>Recommendations</u>
Site 19	Gouley (Mofu)	Dam plus wells in plain of Gouley
Site 25	Mokong	Elimination of present site. Substitute several wells in different neighboring villages. Consideration of new dam site in Southern region of Tsanaga village.
Site 14	Metcheked- Douroum (Mofu)	Readjustment of dam wall. Construction of wells in Metcheked, plain of Ngoktof, Gouambebe (midway between mission and main road).
Site 28	Wazang (Mafa)	Dam plus wells (in plain of Wazang and in mountain) plus redigging of school well.
Site 10	Gousda (Mafa)	Dam plus wells
Site 99	Dalan (Mafa)	Dam plus wells
Site 104	Mandaka (Mafa)	(Not studied) visited
Site 129	Magoumaz (Mafa)	Eliminate dam. Dig 2-3 wells at foot of mountain facing Moskota River. Redig existing wells on other side of mountain where main road stops.
Site 110	Oudahay (Mafa)	Eliminate because of GTE - Mokolo dam. Build wells within access of the population.
Site 86	Soulédé (Mafa)	Dam plus wells
Site 135	Tourgu (Hidé-Ngossi)	Dam plus wells

* Ethnic group is in parenthesis under name of site

<u>No.</u>	<u>Name</u>	<u>Recommendations</u>
Site 136	Ldingding (Mafa)	Reconsider change of site to Matsaghal village
Site 130	Moundoukwa (Mafa)	Dam plus wells
Site 47	Kassa (Podokwo)	Dam plus wells
Site 18	Molkoa (Mada)	Eliminate dam; study digging of wells in plain
Site 140	Gouassa (Kapsiki)	Eliminate present site. Instead dig well at beginning of Gouassa valley and consider new site at Oula. Otherwise redig present wells in Mogodé region (but not exclude well at Gouassa).
Site 153 137	Sirakoutou (Kapsiki)	Change of site 153 to site 137 and dig well at Roufta.
Site 156	Choua-Guili	Eliminate. Digging of wells throughout Canton of Guili.
Site 125	Ouda (Bana)	Dam plus wells
154	Ngossi	Dam plus wells

Total Sites: 21 - 7 ethnic groups

Total number of people interviewed: 160

ANNEX II

EXAMPLE OF MAP WITH THEORETICAL
PERIMETERS OF INFLUENCE
SITE 19

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1188

Douroum

Polnide

Gvél

Goudoum

Malsaly

Ganto

51040

520

Moussy

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