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**FUTURE MANPOWER NEEDS FOR CAA GRADUATES AND AN
EVALUATION OF THE PRESENT TRAINING PROGRAM
BY EMPLOYEES OF CAA GRADUATES**

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I. INTRODUCTION

The Purpose of the Study

The Direction Nationale de Formation et d'Animation Rurale (DNFAR), a unit of the Ministry of Rural Development of the Republic of Mali, currently operates three training schools for junior-level agricultural officers. DNFAR, with the assistance of USAID and the World Bank is in the process of upgrading these training schools. Tuskegee Institute, with the support of a USAID-funded 211-d project and AID/Mali, has conducted a number of studies designed to provide background information useful to the process. The present study adds to this background information by supplying data concerning the future manpower needs of the various employers of the CAA graduates, as well as evaluations of the current training program by the employers.

This information should be useful in helping DNFAR to determine the degree to which the size of the program should be expanded to accommodate increased numbers of students. Furthermore, the evaluations by the various employers should prove useful to DNFAR for the task of curriculum modification.

There was a previous study which dealt with these subjects which was completed in 1976. For use in the USAID Project Paper for the Agricultural Officers Training Project, R. James Bingen conducted an extensive survey of the manpower needs in Mali for junior-level agricultural officers (moniteurs). This report served as a major appendix to the Project Paper. The present study serves as an update to the Bingen report, as well as

providing additional information. The Bingen report is now five years old and the projections made are no longer current. Much has happened to Malian agriculture in the last five years. Much of the international donor activity was either in its initial stages or non-existent at the time of Bingen's work. This new activity has had major impact on the personnel needs of many of the agricultural operations. The present study serves to extend the projections into the coming years when the USAID project will actually be implemented.

New information is added because the Bingen report did not concern itself with gaining the employers' evaluation of the strengths and weaknesses of the current CAA training program. This information is crucial to making informed changes in the curriculum.

Therefore, the present study is designed to provide DNFAR with the views of the employers of the graduates of the training school concerning both their quantitative and qualitative needs with regard to junior-level agricultural officers. How many new officers will they need in the future and what type of training should they have.

Description of the CAAs

DNFAR operates three training schools which are called Centres d'Apprentissage Agricole (CAA). They were located in three different ecological zones--there is one near Kayes, one near Bamako and the third near Koutiala. These schools were established by the French prior to Malian independence. The

curriculum has not been greatly modified since the mid-60' when some revision was made as part of a UNDP project. Previous Tuskegee studies have found that the curriculum is much too general and theoretical and not practical or specific enough to Malian agriculture.

The students spend two years at one of the schools and a third year doing practical training either at a Center of Specialization or at one of the agricultural operations. The subjects studied at the CAAs are agriculture, livestock, economics, extension and general studies. The classroom studies are combined with practical work on the school farm.

Topics Covered by this Study

Given the fact that there is a lack of homogeneity among employers of CAA graduates, a standard questionnaire was not developed. Rather, an interview guide was used. The following is a list of the major topics covered:

1. The number of moniteurs utilized by each operation or other employer of CAA graduates.
2. A description of the actual functions of the moniteurs in each of the Operations/Services. What sorts of tasks do the CAA graduates actually perform.
3. A description of the types of crops grown, equipment used, and technical packages employed in each of the Operations/Services.
4. A critique of the strong and weak points of the CAA graduates currently employed in the Operations/Services. How well do the present CAA training serve the program of the Operation/Service? What sorts of training are CAA graduates lacking which interferes with them doing their jobs well.

5. A quantitative estimation of the future needs for moniteurs for each Operation/Service. (Note! The original plan was to gain estimates for a ten year period. However, almost all of the Operations/Services limited their projections to five or fewer years. It decided to try to obtain reasonable estimates for the next five years.
6. A determination of the receptivity of the Operation/Service to the use of female agricultural officers. If the Operation/Service plans to employ them in the future, in what capacity? Will they be assigned to the same jobs as male officers.

The Collection of Data

All Operations/Services were visited during April and May of 1980. The team for the study was comprised of the following:

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The team interviewed key personnel at each of the Operations/Services. At most of the Operations/Services, the Directors and relevant members of his staff were interviewed. At some, the official in charge of extension and/or training were interviewed.

II. SUMMARIES FOR EACH OPERATION/SERVICE

This section of the report contains summaries of the findings for each of the Operations/Services.

Action Riz-Sorgho

Action Riz-Sorgho is headquartered in Gao in the Sixth Region. The region has regularly experienced a deficiency in grain production. Furthermore, it is remotely located, being more than 1,000 kilometers from Bamako and having extremely poor roads on about half of the route. At the present time most of the needed food and other supplies appear to come from Niger. There is much less commerce between Gao and other areas of Mali.

The Action Riz-Sorgho project was designed to address the problem of food deficiency. Increased production would eliminate the need to import additional stocks. The goal of the Action is sufficiency in food production for the region. In order to encourage greater commerce between the region and other areas of Mali, the Government, with the financial assistance of international donors is constructing an all-weather road between Mopti and Gao. The over-all goal of development activities in the area is increased economic, political and social integration of the region with the rest of Mali.

Action Riz-Sorgho, which is funded by USAID and the Government of Mali, has instituted a number of activities designed to address the problem of grain deficiency. AID funding started in 1976 and is scheduled to terminate in 1981. The major large scale activity is the construction of non-submersible dikes and

water gates in order to provide flood control over about 2,500 hectares of land. With this control, the Action should be able to increase rice and other grain production in the region. At the present time, about 17 kilometers of dikes have been constructed. Another important component of the project has been the establishment of a research station to determine the best technical package--seeds, fertilizer and other farming practices --to be introduced to the area. In addition, the Project is providing training for several Malian participants in the U.S.

The principal crops produced by farmers in the Action area are rice and millet/sorghum. The Action has also fostered vegetable production. The typical agricultural practice has been to plant crops as the waters recede after the river has reached flood stage. The dikes and flood gates should do much to improve on this practice.

There are currently 25 moniteurs employed by the Action. They provide the interface between the Action and the farmers. They are charged with the responsibility of promoting the program and technical packages of the Action. The Director of the Action and several of his associates were questioned concerning their evaluation of the current moniteurs, suggestions for improving CAA training and an assessment of the Action's needs for moniteurs in the coming years.

The over-all criticism of the training being given moniteurs is that it lacks practicality. The Director and his staff emphasized the point that the moniteurs had been much too theoret-

ical. Moniteurs had not been trained to cope with either village agriculture or demands of their jobs. They had not been given the skills to translate the theoretical knowledge learned in the classroom to the reality of the agriculture practiced in the region and could not address the problems of the farmers. They lack the practical experience necessary to deal with the problems confronted in the Gao area.

A related criticism was that moniteurs experienced great difficulty communicating with the farmers in the area. There were several reasons for this problem. First, many of the moniteurs do not speak the languages of the area, the primary one being Sonrhail. In addition, the cultural differences tend to pose additional barriers in communication. Finally, the moniteurs appear unable to talk about agriculture and the problems associated with it. Part of this is a status difference. The moniteurs, as government functionaries, view themselves as superior to the peasant farmers and appear unwilling to discuss problems with the farmers in a give and take situation. The officials reported that moniteurs seemed unable or unwilling to explain things to the peasants. Furthermore, the farmers cite the moniteurs as young, inexperienced city types and tend not to take their advice seriously. This problem points to the need for the CAAs to institute modules in the extension course designed to overcome these problems.

The officials at Action Riz-Sorgho reported that the moniteurs experienced great difficulty adjusting to the region. The

major reason seemed to be that the climate is much different from other areas of Mali, much dryer and much more severe. Also, its relative isolation means that goods and services are usually in short supply. It was reported that most of the moniteurs would prefer to be posted elsewhere. This is also a problem that should be addressed by the CAAs. Typically, the moniteur will be sent to a remote village or a remote area of the country. He must be taught to expect this and to be satisfied with it.

The proposed remedy to the problems of the moniteurs' difficulty adjusting to the milieu and their inability to communicate effectively with the peasant was for the CAA students to spend the third year working at Action Riz-Sorgho. It would be necessary to identify future employees of the Action. The officials noted that for the students to spend their year at another Operation is of only limited value to them if they are going to work in the Region of Gao. The ecology and farming practices are unique and both the future moniteurs and the Action would be well-served if the Third-Year was spent there.

When asked what subjects need more emphasis at the CAAs, the officials responded that economics, hydrology and topology are important to the region and the Action. Also, knowledge of pest control is important. Also, noted was that a large portion of the crop was lost after harvest and that appropriate storage techniques should be taught. Finally, it was noted that the schools should teach professionalism to the future moniteurs. The lack of professionalism was viewed as one of the major

contributors to the current low morale among moniteurs.

The officials expressed a need for increased numbers of moniteurs in the future. They noted that the lack of trained moniteurs has resulted in the use of a number of encadreurs as moniteurs. The Action projects the need for an additional 63 moniteurs by 1984. Given the level of funding from USAID, it appears reasonable that the Action could employ this number if they are available.

The officials did not express a need for monitrices. They noted that conditions in the Region are extremely difficult and they indicated that women would find them too demanding. As with some of the other Operations, the officials fail to note that much of the agricultural work is currently being done by women and that women are currently living in the villages. The suggestion was made that the only job that monitrices might perform would be office work.

In conclusion, Action Riz-Sorgho seems to be a growing Operation and will probably need increased numbers of moniteurs in coming years. The major problem with the current CAA program noted was that the graduates are ill-equipped to deal with the problems of farmers in the region and also have problems adjusting to the region.

Action Ble

Action Ble is located in the Sixth Region with its headquarters in Dire. It is devoted to increasing production in cereals, especially wheat, by small farmers along the Niger River

and other waterways in the Cercle of Dire. The Action was established in 1973 and is currently receiving funding from both FAC (the French Assistance program) and USAID.

The French effort has been to establish a large solar pump which is used to lift water from the Niger River to provide irrigation for approximately 300 ha. controlled by the Action. Currently 50 ha are being exploited and another 110 ha are prepared. A sizable portion of this land is used for research purposes. Trials are conducted testing various seed varieties, fertilizer application, irrigation practices and other technologies. The findings from the research station are utilized by the Action in its extension program with the traditional farmers.

The USAID effort has largely been concerned with providing credit, technical assistance and agricultural inputs such as seeds, fertilizer and small irrigation pumps as well as providing funds for buildings and participants training in extension, management and marketing. Currently, 75 pumps are operational in the area and are being utilized by small farmers on plots averaging only a few hectares. When the USAID project is completed some 500 pumps will have been installed and will be utilized by approximately 2,400 peasant farmers bringing about 5,000 hectares into irrigated production.

The Action Ble staff is relatively small with 26 permanent professional employees. Nine (9) of these are moniteurs. The moniteurs are assigned to villages and are responsible for

providing the link between Action Ble and the village farmers. The technical package which he is asked to deliver involves credit, improved seed, irrigation utilizing motor pumps, the use of various types of simple agricultural machines, planting techniques (i.e., sowing in straight lines), etc. Also, as the research station generates new technologies and/or methodologies, it is the role of the moniteur to communicate these to peasant farmers. He is also required to assist the farmers by providing technical information concerning the production of crops other than wheat. For example, a sorghum crop is routinely grown after the wheat crop is harvested.

The moniteur is supervised by the Chef de Vulgarisation and in turn supervises encadreurs. He plays the dual roles of fiscal agent and extension worker. As a fiscal agent for the Action he delivers the agricultural inputs of credit, seeds, fertilizers, equipment, etc., and facilitates the collection of payments for these items. As an extension worker, he is responsible for teaching the farmers how to utilize the technical package promoted by the Action and to deal with various individual problems encountered by the peasant.

Personnel interviewed at Action Ble indicated a number of problems with the current moniteurs employed by the Action. First of all, they noted that wheat is currently not being emphasized in the course of study at the CAAs. While it is included in the lecture course, the students receive no practical experience with the production of wheat and therefore arrive at

the Action knowing considerably less about the subject than the farmers they are suppose to advise. This causes a credibility problem for the moniteurs.

Likewise, they appear to know little about irrigation and the use of motor pumps. It would be useful to Action Ble if moniteurs had this knowledge. While wheat production is not new to the farmers in the Dire area, the use of motor pumps is. Farmers are experiencing many problems with maintaining them. If the moniteurs had been trained at the CAAs in the use, maintenance, and minor repair of motor pumps, it would have been a major service to Action Ble and would have certainly provided instant credibility for them with the farmers. Along similar lines, it was reported that the moniteurs needed more practical experience with the operation and maintenance of other agricultural equipment--the multicultivator, plow, etc. As the Action attempts to introduce improved machinery in the area they will be dependent on the moniteurs to teach the farmers how to use it. It was the judgment of the personnel at Action Ble that the graduates of the CAAs currently know little about the standard pieces of machinery commonly utilized in Mali.

A particularly strong criticism that was made of the moniteurs working in the Action was concerning their inability to communicate effectively with both the farmers and the professional staff of the Action. Both oral and written expression were judged as deficient. It was recommended that the French course be upgraded and that CAA students be required to

perform at a higher level.

Also regarding communication, it was noted that the moniteurs employed Action Ble have great difficulty communicating with the peasants. Part of this is the inability of some to speak the local language of the area, Sonrhai. This could be solved by the inclusion of functional literacy of national languages at the CAAs. However, in addition to this, it was noted that many moniteurs were unable to express ideas, explain things in terms that could be understood by the farmers.

Action Ble projects its needs for additional moniteurs to be an additional 15 over the next three years. The additional moniteurs are needed to service the additional farmers that will be brought into the Action as the additional 425 pumps are made available.

When asked about the future need for monitrices, it was reported that the Action currently has no plans to hire any. The rationale was that women were not involved in wheat production in the area. Also, it was noted that the conditions in the region are extremely difficult and that because of this women would have a difficult time functioning. (However, it should be noted that local women in the area are involved in various aspects of agriculture and consequently are already working in the same conditions as men.)

In summary, Action Ble seems to be a growing organization and while small will demand approximately 15 new moniteurs over the next few years. The basic criticism of the CAAs is that they

do not currently have a curriculum which is relevant to the Action.

Compagnie Malienne Pour Le Development Des Textiles

The Campagnie Malienne pour le Development des Textiles, known as C.M.D.T. and Operation Mali-Sud, is headquartered in Bamako and services all of the Third Region and parts of the First, Second, Fourth and Fifth Regions of the country. It was originally established by the French as a cotton production company. In recent years, C.M.D.T has expanded its concerns both to other crops--dah, corn, rice and millet/sorghum, and to non--agricultural concerns--health, adult literacy and general community development. Also, there is increasing interest in livestock production. Thus, C.M.D.T. is currently moving away from the model of a production company concerned only with a cash crop (cotton) toward the model of integrated rural development which is concerned with the production of food crops as well as cash crops, and with over--all community development rather than just the economic aspect.

In 1978, C.M.D.T. was involved in 4,327 villages and reported to service about 86 percent of the rural population in these area and 78 percent of the farms. The researcher visited a number of villages associated with C.M.D.T. and a number C.M.D.T. sub-units and it is his judgment that C.M.D.T. probably has more impact on the agriculture being practiced in its jurisdiction than the other Operations have in theirs. Part of this is due to the fact that this endeavor has had a much longer period of

existence than most of the others as well as a much firmer base of financial support. Furthermore, it has been one of the few agricultural para-statal organizations to experience consistent financial success. In 1980, C.M.D.T. reported involvement with 78,000 farmers. There were 118,000 hectares in cotton, 380,000 in millet/sorghum, 27,000 in corn, 3,300 in dah and 5,500 in rice. C.M.D.T. is currently receiving technical assistance from the French (FAC).

C.M.D.T. currently employs 82 moniteurs and 12 veterinary nurses. Typically, the moniteur serves either as a chef de ZER or a chef de base. Officials at C.M.D.T. indicated that in recent years they have experienced a major shortage of trained moniteurs. The CAAs have been unable to supply their needs. Therefore, most of the positions normally assigned to moniteurs are being given to encadreurs. Furthermore, C.M.D.T. operates a training program designed to upgrade encadreurs to the level of moniteurs. At the present time, most of the moniteur-level positions are being filled by encadreurs. This training program is also used to remediate the deficiencies that exist in the moniteurs and encadreurs.

C.M.D.T. has a well defined set of technical packages which are based both on research and experience. It is the function of the moniteur (or his encadreur replacement) to deliver these technologies to the villages and the individual farmers. An individual moniteur is assigned to between five and ten villages, depending on the sizes of the villages and the distance between

villages. He carefully monitors the agricultural campaign in these villages from the stage of soil preparation to the marketing of the crop. He arranges for the various agricultural inputs such as seed, fertilizer, equipments and the credit to pay for them. As in the other Operations, he serves as the point of contact between the Operation and the farmer. It is through him that the program of C.M.D.T. reaches the farmer. He holds public meetings and provides demonstrations.

When questioned about their criticisms of the CAA-trained moniteurs employed at C.M.D.T., the officials noted that while the theoretical training seemed sufficient, the CAA graduates lacked knowledge of practical agriculture. It was noted that the graduates do not know how to use agricultural equipment. (It should be noted that C.M.D.T. utilizes a wide range of machines from relatively simple tools and animal traction to large sophisticated motorized tractors and other equipment). The officials noted that the graduates' knowledge of general agriculture was much too theoretical and not practical enough. It was suggested that each course at the CAAs be taught as applied agriculture. Anything taught in the classroom should be demonstrated in the field. Students should learn agriculture by doing agriculture.

The officials also noted that many of the students had problems communicating with the peasants. Some cannot speak the local languages. This could be remediated by teaching the national languages at the CAAs. However, there is a more basic problem. The moniteurs seem unable to communicate with the farm-

ers on their level. The farmers have problems and need solutions. The moniteurs seem unable to apply their knowledge to the farmers' problems and unable to discuss agriculture with the farmers in terms that they can understand. It was noted that very often the encadreurs are much more successful working with the farmers than the moniteurs because most of the encadreurs are from the villages and understand the farmers and their problems. Also related to this point, the officials were insistent that all extension materials must be written and presented in the national languages. The moniteurs must be able to communicate agriculture in the national languages and not just in French.

When discussing how the CAAs might improve their curriculum, the officials suggested that closer ties be developed between the Operations and the CAAs. It was suggested that if the CAAs were aware of what is actually going on in the Operations and if the Operations could routinely make suggestions for curriculum modifications, then the training provided by the CAAs might be more practical and responsive to the needs of the client Operations. It was noted that the CAA at M'Pessoba is close to one of the major centers of C.M.D.T. at Koutiala and that it would be helpful to both the CAAs and to C.M.D.T. if regular contact could be established. C.M.D.T. could serve as a laboratory for M'Pessoba. The students could have experience with agriculture as it is currently being practiced in Mali.

C.M.D.T. expressed a need for an additional 50 moniteurs per year over the next five years-- 250 total. Given the facts that

C.M.D.T. appears to be economically sound and growing, as well as its present deficiency in moniteurs, the estimates seem reasonable. One was given the impression that if 50 CAA-trained moniteurs were presently available they would be immediately hired by C.M.D.T.

With regard to the question of monitrices, the officials noted that they cannot be utilized in the same way moniteurs are. The moniteur's job requires him to be mobile and the officials indicated that this would be difficult for women. They said that perhaps monitrices could be employed for special projects for women, such as health and vegetable growing.

In summary, C.M.D.T. is one of the larger of the agricultural operations in the country and potentially one of the larger employers. In the past, C.M.D.T. has not been able to employ as many CAA graduates as they had positions and has had to substitute encadreurs for them. The major criticism voiced concerning CAA-trained moniteurs was that their training had not been practical enough. It was suggested that a closer working relationship between the Operations and the CAAs be developed. C.M.D.T. has evidenced a need for large numbers of additional moniteurs in the next few years.

Office du Niger

The Office du Niger, which is headquartered in Segou, was established by the French during the 1930's. It was the most ambitious of the French projects in West Africa. A large dam across the Niger was constructed at Markala and a canal from that

point to Niono to the north was also built. This allowed for the irrigation of land on both sides of the canal. The Office, under the French, was a government subsidized endeavor. The French tried many crops but for various reasons it was never commercially successful. After independence, the Government of the Republic of Mali took control of the Office.

Currently, the Office engages in both direct and tenant farming. The Office controls all of the land in its jurisdiction and has the authority to determine how the land is to be farmed and who is to farm it. Most of the land is farmed by the Office itself with paid workers. Some of the land uses individual farmers who share the crop with the Office; a contractual arrangement is made with the peasant.

The two crops currently being grown by the Office are rice and sugar. The current goal of the Office is to have about 70,000 hectares under cultivation. The Office is divided into 10 sectors, 8 of which grow rice and 2 of which produce cane. There is a refinery associated with the sugar production.

The job of the moniteur varies greatly depending on whether or not the land is being farmed by individual farmers or by the Office itself. In the latter case, the moniteur essentially becomes a crew boss or foreman. He is assigned to a particular parcel of land and supervises all of the labor on that land. Both of the cane sectors are managed this way and some of the rice sectors. In the case of tenant farmers, the moniteur represents the Office to the farmer. He is in charge of gaining the

contractual agreement and making certain that the farmer fulfills his end of the agreement. He supplies the credit and other agricultural inputs to the farmer and performs regular extension functions. There appears to be little similarity between the jobs of moniteurs in these two situations.

There is a wide range of technologies employed by the Office du Niger; from the simple daba to large tractors and other motorized implements. The systems of canals, sub-canals, ditches, etc. which supply irrigation and drainage to the various parcels are complex and require expert management. The organization of the Office is impressive and seems to be staffed with qualified and experienced people at the higher levels.

There are presently 85 moniteurs employed with the Office. The officials of the Office were very articulate when talking about the weaknesses of their moniteurs who were trained at the CAAs. It is fair to say that while almost all of the employers of the CAAs' graduates found fault with the training, the Office du Niger was the least satisfied with the quality and quantity of training. The criticism started with the point that the graduates' knowledge of rice and sugar cane was not adequate. They lacked basic knowledge from elementary plant physiology to irrigation and hydrology to general production techniques. The officials noted that knowledge in these areas are absolutely essential to the moniteurs. Without it they cannot function effectively in their jobs.

Other subject areas noted as weak were agricultural econo-

mics (including credit), surveying, farm mechanization, math, soils and composition. However, it should be noted that the emphasis was put on practical training. They pointed out that it was not enough to know about something; the students needed hands-on experience with each of the subjects. For example, they needed more than lectures about farm mechanization; they need to have the actual experience of plowing and operating the various machines.

As with other Operations, the officials at the Office du Niger noted that the moniteurs were particularly weak in extension skills. It was said that the moniteurs just do not know how to talk to the peasants; how to gain their cooperation or how to explain things to them. Since the moniteur serves as the link between the Office and the peasants, this creates a great deal of difficulty for the organization. For unless the Office is able to gain the cooperation of the peasants, and unless the peasants can successfully execute the various technical packages of the Office, the whole program is put in jeopardy.

The Office is planning major growth over the next several years with expected funding from the World Bank. With this expected growth, additional moniteurs are needed. The estimate was that an additional 68 moniteurs would be needed.

When the question of monitrices was raised, the officials indicated that they planned to employ one monitrice for every two villages in the Office's jurisdiction. There are currently about 140 villages in the project. The monitrices would be utilized in

community development type activities such as health, nutrition, adult literacy, etc. This seems to be well thought out and planned by the Office. Unlike many of the other Operations, the Office seems to have been making plans to utilize monitrices.

In summary, the officials of the Office were extremely critical of the current training program at the CAAs and suggested that the graduates needed much more information about the crops they are going to be working with and that this information should be taught in terms of practical agriculture. The Office seems to be rapidly growing and will probably continue to be a large employer of CAA graduates, both male and female.

Operation Arachide et Cultures Vivrieres

Operation Arachide is the oldest of the agricultural operations in Mali. It was started in 1967 and is headquartered in Bamako. It originally serviced primarily areas in the Second Region but has grown to include major areas in the First and Fourth Regions. In the past, Operation Arachide received funding from the French (FAC) and the World Bank. At the present time, the Operation is without outside funding but is currently negotiating with the World Bank for new support.

The legal status of the Operation is also being reviewed. It has been proposed that the Operation be changed to the category of an Office. The Operation seems to be moving more toward an integrated approach to development rather than just focusing on agriculture. In addition, it has been proposed that the headquarters be moved to Kita.

As mentioned above, the area covered by this operation is large. Approximately 2,935 villages are included and 116,000 cultivators are serviced by the Operation. The major crops produced by the farmers in the Operation are peanuts, millet and corn.

There are currently 72 moniteurs employed in the Operation. They are employed as Chefs de Sous-Sector or Chef de Base. They provide the interface between the Operation and the peasants. The Operation has developed technical packages to correspond to the agricultural calendar. It is the job of the moniteurs to promote these packages. The officials noted that because of weaknesses in their preparation, many moniteurs did not understand the psychology of the peasants nor the milieu in which the agriculture takes place. He suggested that the CAAs should devote more attention to training the students in the techniques of extension and the psychology of peasants. Unless the moniteurs can provide an effective interface between the Operation and the peasants, the Operation will face difficulty realizing its objectives.

The Director noted that while the moniteurs' knowledge of general agriculture seems sufficient, there are problem areas. For example, it was mentioned that the moniteurs lacked specific knowledge of peanut production. It was noted that a proposed Center of Specialization for this crop should solve this problem. Math and surveying techniques were also noted as weaknesses as well as written communication.

The projected need for moniteurs was stated to be 173 over the next ten years. This would be 87 over the next five years. This projection is dependent on whether or not the Operation is able to obtain the necessary financing. Given the relatively large demands stated by this Operation, it will be worth monitoring these developments. If the Operation receives funding, major demands will be made on the CAAs for students; if not, then one would expect only minor demands.

The Director also stated a need for monitrices. The projected need over the next 10 years was said to be 38. The Operation proposes to utilize monitrices to teach agricultural practices to the village women, especially vegetable gardening. The Director said that the monitrices should receive the same training as the moniteurs.

Finally, the official at this Operation volunteered that there should be a regular exchange of ideas between the Operation and DNFAR. Such a dialogue would insure improvement of the CAA program. DNFAR would be aware of the current technologies being practiced and the Operation would better understand the education program of DNFAR. Operation Arachide seems to be at a crucial point in its history. Elaborate plans have been developed for its restructuring. However, these plans are dependent on external funding for their realization. If these plans are realized, then the Operation will be making major demands on the CAAs for personnel.

Operation Baguindaeda

Operation Baguineda is a combination state farm and marketing center for farmers in the villages nearby. The principal crops are green peppers and tomatoes with some milk production. There are currently 600 hectares under production. The vegetables are primarily grown for the European market. The peppers are transported fresh regularly by airplane and the tomatoes are typically processed by a canning factory at the farm. The Operation is currently receiving funding from the French (FAC).

There are currently 15 moniteurs and four veterinary nurses employed at Operation Baguineda. They serve as Chef de Sector de Base and supervise all aspects of work in their sector. Most of the moniteurs work directly on the State Farm, but a few work with the villagers involved in vegetable production. There is a contract between the Operation and the peasants. The moniteur monitors this contract making certain that the farmers are provided with seed, fertilizer, credit, etc. and that the farmer delivers his harvest to the Operation. The major extension practices are meetings and demonstration. There are 17 villages and 240 farmers participating in the program.

There are two major problems with the present moniteurs. The first is that they do not know how to operate the machines currently being used by the Operation. Secondly, their knowledge of agriculture tends not to be very practical and as a consequence, they cannot communicate effectively with the farmers

about the farmers' problems.

The Director was unable to provide an estimate of the number of new moniteurs needed by the Operation over the next few years. He said that much was dependent on financing and the growth of the Operation. It is worth noting that there are currently fewer moniteurs employed by the Operation than several years ago. The Operation does not seem to be growing and one should not expect its future needs for moniteurs to have a major effect on the over-all national situation.

The Director was receptive to the notion of using monitrices. He noted that much of the vegetable production is done by women and that monitrices would probably be more effective working with them than the moniteurs. However, he was unable to indicate the number of monitrices which might be employed in the future.

Operation Developpement Integre-Kaarta

Operation Developpement Integre-Kaarta (ODIK) is headquartered in Nioro du Sahel on the border with Mauritania in the First Region of the country. The Operation is currently receiving support from the Canadian Government. This Operation seems to be somewhat different from the others in that it is not at the present time concerned with the marketing of the agricultural products produced in its jurisdiction. Rather, it is reportedly an integrated development activity concerned with such areas as agriculture, livestock, waters and forests, adult literacy, roads and

health. Officials noted that in the future they planned to include marketing. Presently, the concern is to make the area sufficient in food production.

The Operation is broken up into 16 zones which include 464 villages. A wide range of crops are being produced and encouraged by the Operation including millet, sorghum, corn, rice and peanuts. Thus far, there seems to be little innovation or few technical packages introduced by the Operation. However, a number are planned. The Operation is just beginning to get organized and to put its program in place.

There are currently 51 moniteurs employed by the Operation. (It should be noted that the Operation also employs 21 veterinary nurses). The officials noted that they were basically satisfied with the "theoretical" training of the moniteurs and the major problem was with practical aspects. The Director indicated that the moniteurs should be able to deal with all of the major concerns of the Operation--agriculture, livestock, health, etc. The current moniteurs are not. Furthermore, they lack extension skills. They have problems communicating with the villagers. They are supposed to represent the Operation in the village. If they cannot articulate effectively the program of the Operation, then they are of only limited value.

Part of the problem in communication is, once again, the inability of the moniteurs to speak the languages of the area. Marka is spoken in much of the area and most moniteurs cannot speak it. This, once again, points to the need for a program to

train the students at the CAAs in the national languages.

It was also noted that the moniteurs' French reading and writing skills were not sufficient. This hampered their ability to read and write the necessary reports associated with their jobs.

Another problem noted was that moniteurs were not experienced with the various tools being utilized by the farmers in the region. Specifically, they were not experienced with animal traction. The Director noted that the CAAs should put increased emphasis on this subject.

The Operation projects a need for an additional 39 moniteurs over the next few years and indicated that they could absorb them at about 10 per year. Given the Canadian funding, it appears likely that the Operation will continue to grow at a relatively fast rate and that new moniteurs will be hired.

Concerning the question of monitrices, the Director indicated that the Operation had no plans to hire any. He said that the region was just too difficult for them.

In conclusion, Operation Developpement Integre-Kaarta seems to be a growing concern. It has had funding from the Canadian government for the last few years and is at the point where it is beginning to get its program together. The chief criticism of the CAAs' graduates is their lack of extension skills and knowledge of practical agriculture. It appears that the Operation will experience continued growth over the next few years and increased numbers of moniteurs will be employed.

Operation Haute Vallee

Operation Haute Vallee is headquartered in Bamako and services the area on both sides of the Niger River south of Bamako to the Guinea border. It is the area in Mali with the highest rainfall and has been slow to develop agriculturally because of poor roads and inadequate means of transportation.

Until recently, the Operation focused on tobacco production. However, the Operation received major funding from USAID in 1978 and has expanded its concern to include peanuts, millet, corn and cotton. Likewise, the poor system of transportation limited the Operation to serving only villages which were situated close to the only two roads in the area. The USAID funds provide for the development of all-weather roads and feeder roads which opens up a great deal more land and allows the Operation to serve more villages. When this occurs, one can expect increased needs for moniteurs. Currently, the area is grossly underdeveloped in terms of agriculture. If the transportation problems, which inhibit the delivery of agricultural inputs to the farmers in the area and impede the transporting of the harvest to the urban market, are corrected, the Haute Vallee could well become a major supplier of food to the Bamako market. It is close and has many more natural resources for agriculture than most other areas in Mali.

There are presently 23 moniteurs employed by Operation Haute Vallee. They serve as Chef de Sector de Base. Many of these moniteurs were interviewed two years ago, and it was discovered

that they were being provided with little in the way of supervision and that they were extending little to the farmer. Much of these problems are due to the relative inaccessability of the area. Hopefully, with funding from USAID technical packages will be developed and supervision will be supplied.

In spite of points made above, it should be noted that the officials at Operation Haute Vallee expressed general satisfaction with the CAA trained moniteurs. They indicated that the moniteurs' training was sufficient for their assignments. It was noted that the Operation is now emphasizing animal traction and that future students should be trained in this subject as well as in farm mechanization in general.

The projected needs for new moniteurs by the Operation over the next few years was put at 27. Given the USAID funding, this estimate seems reasonable. As new lands are opened up to the Operation, more moniteurs will be needed.

When questioned about the use of monitrices, the officials indicated that they might be utilized in vegetable production. There appears to be no explicit plan for this.

In summary, Operation Haute Vallee is just now beginning to establish itself. As it does, one should expect increased needs for CAA graduates. Given the rainfall, soil type, closeness to the Bamako market, one should expect this area to develop rapidly once the transportation problems are solved.

Operation Mils-Mopti

Operation Mils-Mopti headquartered in Sevare in the Fifth

Region is one of the larger of the agricultural operations and currently employs many moniteurs. The Operation is concerned with the commercialization of millet and sorgum throughout its jurisdiction and the promotion of vegetable production on the Dogon plateau. The Seno plain, which is covered by the Operation, is one of the more productive grain-growing areas in Mali. The Operation was established to provide the infrastructure necessary to commercialize the crop.

The Operation has been in existence for a number of years. However, until the Operation received financial support from USAID in 1976 it experienced little success in achieving its goals.

In 1976, USAID began major funding of Operation Mils-Mopti. The project has been multi-faceted. An all-weather road has been constructed connecting the Seno plain with the major hiway in the region. A research station has been established to test seed varieties, fertilizer applications, etc. Technical packages for extension are being developed. Training for extension workers (moniteurs) is being provided. A credit system has been developed which has enabled many peasant farmers to purchase simple machines, fertilizer, etc. Management training is being provided to officials of the Operation. A fleet of large trucks designed to haul agricultural inputs to the farmers and their crops to market have been purchased.

An indication of the growth of the Operation can be seen when the number of moniteurs is examined. When Bingham visted

the Operation in 1976, he found only 35 moniteurs working in the Operation and when assessing future needs indicated that due to the financial problems of the Operation no firm manpower projections could be made. It is important to note that as of this survey, there are 120 moniteurs employed by Operation Mils-Mopti. The USAID funding seems to have made the difference. The current distribution of moniteurs is as follows:

<u>Cercle</u>	<u>Number</u>
Mopti	16
Djenne	15
Bandiagara	21
Koro	23
Bankass	25
Douentza	14
Te'nenkou	6
TOTAL	<u>120</u>

The moniteurs serve as either Chef de Base or Chef de Sectors. The Operation has one of the more developed technical packages in Mali. It involves improved seed, tillage, fertilizer, credit, marketing, etc. The approach is to utilize pilot farmers to demonstrate the improvements and to try to convince other farmers to adopt improved technology. Since the Operation covers a number of ecological situations, the Operation has developed a different package for each situation.

When asked to comment on the weaknesses of the current moniteurs working in the Operation, the officials listed several. First of all, they indicated that many of the moniteurs lacked the ability to speak the language of the peasants. Dogon is spoken in a large portion of the villages served by the

Operation. Unfortunately, not many of the moniteurs speak Dogon. Others do not speak Peuhl, another language spoken in many of the villages. This inability to communicate in the language of the peasants, to a large degree, renders the moniteurs ineffective. The farmers cannot come to them with their problems and the moniteurs cannot teach the farmers the improved technologies. It was suggested that languages might be taught at the CAAs.

The officials indicated that the chief problems faced by the peasant farmers are insects and grain storage. They indicated that the CAAs should teach improved methods of dealing with these problems. Currently, the moniteurs are not well-versed in these subjects. It was also noted that the CAA students should be trained in topology and surveying.

The officials at Mils-Mopti also reported that the CAA graduates were weak in farm mechanization. It was noted that the moniteur needs to be familiar with tools used by the peasant from the daba to animal traction and the plow. There was no need seen for the moniteur to know about tractors.

It was pointed out that moniteurs who had done their third-year practicum at the Operation tended to have an easier time adjusting to their jobs the first year of employment. It was noted that moniteurs who spent their third-year elsewhere, spent the first year at the Operation learning the milieu, the organization of the Operation, etc. It was suggested that students who are going to be employed at Operation Mils-Mopti

should be assigned there for their third year.

The officials were not able to provide estimates of their moniteur manpower needs for coming years. However, it should be noted that the Operation has already experience rapid increases in the numbers of moniteurs employed and additional expansion is anticipated. As a matter of fact, there is talk of a special training program for moniteurs to be run by the Operation. This has been proposed because the CAAs have been unable to meet the demands of the Operation for trained extension personnel. Given the projected growth of the Operation it seems reasonable to project an additional 50 moniteurs over the next five years.

The officials did note a need for monitrices in the Operation. While numbers were not projected, it was noted that monitrices could play an important role in the program of the Operation. It was suggested that the monitrices could develop special programs for women such as vegetable growing and health care.

In summary, the use of moniteurs has increased rapidly in Operation Mils-Mopti. The Operation has greatly expanded in the last few years and future growth is anticipated. The major problem faced by the moniteur is communicating with the farmers.

Operation Production des Semences

The Operation Production des Semences is headquartered in Segou with production sites at several locations throughout Mali. This Operation is in charge of providing seed to all agricultural Operations in the country. Currently, they are producing seed

for rice, millet, cotton, peanuts and dah.

There are currently 12 moniteurs being employed by the Operation. They are used primarily to supervise the various aspects of seed production--planting, irrigation, harvesting, storage, treatment, etc. Thus, the moniteurs perform the function of a foreman for the various work crew associated with seed production. It is important to note that they are not involved in extension activities at all. They only supervise paid employees. Also, they seem to get close supervision from people with quite a bit of technical training.

Overall, the officials at Operation Production des Semences did not voice any strong criticisms of the current moniteurs. They indicated that they were trained well enough to perform the assigned tasks.

They indicated that an additional 12 moniteurs would be needed over the next few years as the Operation continued to expand its activities. One was unable to determine whether or not this Operation would have the funds necessary to expand.

This Operation seemed interested in using monitrices in its work. The role which was mentioned as most appropriate for monitrices was that of working in the laboratory. There was no indication of the number that might be utilized.

Operation Riz Mopti

Operation Riz-Mopti is headquartered in Sevare and services about 7,000 peasants who farm about 17,000 hectares of rice in several locations in the flood plain of the Niger and Bani

Rivers. Its plan calls for an additional 40,000 hectares and 17,000 peasants to be brought into the Operation. Unlike most of the other Operations, Operation Riz-Mopti is not attempting to improve traditional methods of peasant cultivation. The Operation has established the infrastructure necessary for the polder system of rice production. The farmers are not given the option of participating in the Operation; village peasants must grow rice, using seeds, fertilizers, and various technical packages from the Operation or lose their rights to farm the land. The systems of polders, involving inlet gates, common canals, drainage ditches, and dikes, necessitate that the land must be farmed as a unit. Farmers must share a common schedule of work. This schedule of work is determined by the Operation. The Operation provides the management for the land. The farmers provide the labor.

A wide range of technology is utilized by the Operation; from simple daba to the use of large tractors for some of the plowing. Increasingly, animal traction is being utilized in more and more of the activities of the Operation. The Operation owns much equipment--plows, harrows, harvesting machines, etc. which can be used with animal traction. This year the Operation hired tractors to do custom plowing on at least one of its polders.

The moniteurs who work for Operation Riz-Mopti are utilized in the management of the polders. They are supervised by the Chef de Casier and in turn supervise several encadreur. Each moniteur is responsible for several hundred growers which covers

500-1000 hectares of land. The moniteur with his encadreurs assure that the management plan of the Operation is followed. This management plan is expressed in terms of themes. The moniteur holds village meetings in order to explain these themes and to organize the work. The moniteurs with the encadreurs distribute the agricultural inputs and supervise all phases of production, harvesting and commercialization. The Operation operates a mill at Sevare, where all of the crop is processed.

The Operation has a Chef de Vulgarization who is responsible for in-service training of the moniteurs. During the off-season, the Operation provides training sessions for the moniteurs. The officials of the Operation maintain that these sessions are crucial, because they are remedial in terms of the deficiencies that CAA graduates have. They also serve to train the moniteurs in the specific production technologies of the Operation. Operation Riz-Mopti seems to be fairly advanced, relative to other Operations, in terms of in-service training.

There are currently 36 moniteurs employed by Operation Riz-Mopti. The officials at the Operation indicated that the training, which the moniteurs complete at the CAAs, is not sufficient. The Operation must provide training to the graduates, before they are prepared to work in the Operation. They noted that students were particularly weak in the area of farm mechanization; students do not know how to operate the various types of machines currently being used by the Operation. They said that students who spent their third year at the Center for Rice

Specialization at Dioro were better prepared than those who spent their third year elsewhere. Furthermore, they indicated that moniteurs who spent the third year at Riz-Mopti were the best prepared. The important point is that it is necessary to retrain CAA graduates before they can effectively be utilized in the Operation.

When questioned concerning the nature of the retraining, the officials said that most of it was concerned with extension techniques. They teach the moniteurs how to approach and communicate with peasants. They also teach them about the particular milieu they are going to be working in. In addition, they are taught practical agriculture; the farming techniques that are currently employed by the farmers in the region. Finally, they are taught the utilization of farm machinery. The retraining seems to be far more than just focusing their previous training to a new situation. Basics are being taught. The Operation seems to assume that they know little about agriculture when they arrive. They are taught the fundamentals, at least as they apply to rice production in the region.

When asked about major weaknesses of the current moniteurs, the officials noted that many of them have trouble communicating with the peasants. One problem is that many do not speak the languages of the region and must work through interpreters to communicate with the farmers. However, the problem is more general. The moniteurs seem to lack the ability to talk to farmers in their own terms. Because of this, the retraining

conducted by the Operation puts heavy emphasis on extension techniques.

When questioned concerning specific subject matter deficiencies, the officials reported several. First of all, they noted that the CAA graduates lacked knowledge about both hydrology and topology. Both of these subjects are extremely important to work in the Operation and should be taught in the CAAs. Secondly, it was noted that the graduates knew little about economics. The officials noted that moniteurs are asked to provide economic advice to the farmers. They are concerned about farm level economics, and the moniteurs seem unable to offer advice. Another problem noted was that the CAA graduates are unable to offer advice concerning seed selection and storage.

The officials project a need for an additional 25 moniteurs over the next 5 years. These moniteurs will be used to provide technical staff to the new lands being brought into the Operation and to reduce the moniteur/farmer ratio on existing lands. It appears that Riz-Mopti is a growing concern and that the projection of future needs for moniteurs is realistic.

When questioned concerning the need for monitrices, the officials indicated that there is a role for women at this level in the Operation. When questioned concerning the sorts of jobs they could performed several were mentioned. First, it was suggested that they could be used in community development activities. Secondly, it was felt that they could be effectively utilized in the adult literacy program; the program to teach

writing in the local languages. Finally, the officials said that monitrices could be assigned to the same types of jobs as moniteurs. When questioned concerning the number of monitrices needed, no number could be given. One had the impression that the Operation had not given a great deal of thought to this question.

In summary, Operation Riz-Mopti reported a number of problems with the current training of moniteurs by the CAAs and indicated that many of the problems could be solved, if the CAAs sent the students to the Operation for their third year of training. It appears that Operation Riz-Mopti will continue to grow and that they will expand the number of moniteurs by about 25.

Operation Riz-Segou

Operation Riz-Segou is headquartered in Segou in the Fourth Region of the country. Like Operation Riz-Mopti, it is completely concerned with rice production using the polder technique. It is divided into four production zones which are further subdivided into several casiers.

The Operation owns a large amount of equipment. Officials reported over 11,000 charrues, 6,000 charrettes and about 4,000 hurses. The Operation depends heavily on animal traction and has over 24,000 animals for this purpose. This Operation is currently receiving financing from the F.E.D. The Operation is also involved in community development, operates centers for health, adult literacy, and a number of programs for children.

Currently, there are 46 moniteurs employed by the Operation. As with Operation Riz-Mopti, the empoldered lands associated with Operation Riz-Segou are managed as a whole rather than being managed by individual farmers. The Operation has a technical package including seed, fertilizer and mechanization. Each farmer is required to conform to the technical package of the Operation. The moniteur is the person in the Operation that insures that the farmer indeed adopts the correct package and follows the prescribed schedule. Typically, the moniteur serves as the Chef de Casier or Chef de Sous-Casier and is responsible for about 300 families. One of the interesting points to note is that the Operation employs only one additional moniteur than the 45 found by Jim Bingen in 1976.

The moniteurs are required to practice standard extension techniques. The Operation utilizes the method of themes which is closely tied to the agricultural calendar. The themes emphasize topics when they are most relevant--plowing in the Spring, planting techniques when the rains start, harvesting practices at the appropriate time, etc. The moniteurs provide demonstrations and help the farmers carry out these themes. In addition, the moniteur arranges for the necessary inputs and the credit to pay for them. Also, the commercialization of the rice is carried out through him.

When questioned about the problems that the Operation has experienced with the moniteurs trained by the CAAs, the officials noted that the major problem is their inability to apply exten-

sion techniques. They specifically said that the moniteurs had major problems communicating with the peasants. It is worth noting that in the Segou area the problem is typically not the inability of the moniteurs to speak the local languages. Bambara is spoken in the area and virtually all moniteurs can speak Bambara. The problem is the inability to communicate with the farmer on his level about his problems. The moniteurs seem only able to repeat almost verbatim what they were taught in class or the training sessions conducted by the Operation. Furthermore they seem unable to understand the farmers' problems, to relate to the peasants. Also noted as a problem was the lack of training that the moniteurs had with farm equipment. This Operation has much equipment, and the moniteurs are expected to both operate and teach others how to operate the equipment.

As with some of the other Operations, Operation Riz-Segou routinely provides retraining for their moniteurs. These both serve to make the moniteurs aware of the specific programs of the Operation and to remediate weaknesses in their previous training.

When asked for suggestions to improve the CAAs, the general response was to make it much more practical: provide the students with practical experience in agriculture; teach the agricultural sciences in a practical manner, relating them specifically to the problems they will encounter as moniteurs.

While the Operation is primarily concerned with rice pro-

duction, the officials noted that their moniteurs needed basic knowledge of and experience with a wide range of crops including rice, cotton, millet and peanuts. They emphasized that this knowledge and experience should be specific to the milieu in which the moniteurs are going to be working. Also, they noted that the students should be provided with experience using the technology currently being utilized by the farmers and Operation for these crops.

The projected needs of the Operation for new moniteurs, over the next five years, is 36. Given the F.E.D. funding and apparent vitality of the Operation, one should be able to expect this increase. It is also worth noting that these figures seem to have come from some plan rather than just speculation.

When questioned about the need for monitrices in the future, the officials noted that they might be used in community development activities. They specifically noted that they could not be used in the same role as moniteurs. One official specifically said that the Operation must deal directly with the head of household, a man, and that this was an impossibility for a woman.

In summary, Operation Riz-Segou reported that the chief problem with their current moniteurs is their inability to communicate effectively with peasant farmers. The solution proposed for improving training was to make it much more practical and much more specific to the milieu in which the moniteurs will work. The Operation seems strong and growing and one should expect it to hire several dozen additional moniteurs over the next five

years.

Operation Vallee du Senegal, Terekile, Magui

This Operation is headquartered in Kayes in the First Region of the country. Currently, the only aspect of this project which appears to be functioning is Action des Perimetres Irrigues. The Operation was started in 1975 with funding from the French (FAC). Funding was terminated in 1977, and the Operation has experienced major financial problems ever since. Currently, OMVS is undertaking studies in the region and new funding for the Operation seems to be tied to the specific programs developed by OMVS. Also the proposed USAID First Region Project should impact on this Operation.

Currently, 13 perimeters are functional and a 14th is about ready. The crops grown are wheat, corn, millet/sorghum and vegetables. The farming on each perimeter appears to be rather intensive.

There are currently 14 moniteurs employed by the Operation (Action), and each moniteur is responsible for only about 25 hectares and supervises only about 50 farmers.

When questioned about the weaknesses of the current moniteurs, the officials of the Operation noted several. They indicated that the moniteurs evidenced problems communicating with the peasants. They seemed unable to explain things to them, to communicate on the level of the peasants. Examples given were that the moniteurs could not successfully explain to the peasants how to use pumps and other machines. Also mentioned as a problem

with the moniteurs was their lack of knowledge of vegetable production. Since this is one of the major crops of the Action, it seems important that the moniteurs know this subject.

In addition, the officials noted that the moniteurs had problems with writing. They are required to submit reports and these tend to be of an inferior quality. It was suggested that more attention needs to be paid to report writing and the use of statistics at the CAAs.

When questioned about the future need for moniteurs and monitrices, the officials indicated that their needs were being studied by the IER and that they had no idea what they would be. They said that the future of the Operation was already dependent on funding. If substantial funding was provided, the Operation would expand and additional moniteurs would be employed.

It seems fair to assume that both the USAID First Region Project and the over-all OMVS development activities will result in substantial development activity in the area. Either Operation Vallée du Senegal, Terekole, Magui will greatly increase its number of moniteurs or another organization will be established which will do so.

Operation The

Operation The is located near Sikasso in the Third Region of Mali. Operation The is a plantation established with the aid of the Republic of China and is concerned solely with the production and processing of tea. A new project is being funded by F.E.D. There are currently 162 permanent employees and 303 temporary

employees. While some farmers in surrounding villages grow tea, the Operation is not involved with them. The employees are used in the production, harvesting and processing of tea.

There are currently seven moniteurs employed at Operation The. A moniteur is in charge of a production sub-sector, about 100 hectares of land. He supervises all of the work associated with that block of land. His own work is closely supervised by his superiors who have scientific training in tea production.

The Director of the Operation indicated that he was basically satisfied with the performance of the moniteurs. He indicated that they were able to perform the work assigned them. It should be noted that these moniteurs do not work independently. Rather, they are highly supervised. They are given constant supervision in carrying out the various production technologies associated with the Operation. The total amount of land being farmed is relatively small so that communication is very easy and no one is ever far from the main office.

With the expected expansion of the Operation, about 15 additional moniteurs are needed. They would be utilized in the same fashion as the present moniteurs. The Operation runs two centers for adult literacy; monitrices could be involved in these.

Operation Zone Lacustre

Operation Zone Lacustre is headquartered in Goundam in the Sixth Region. It is concerned with the agricultural development of the various lands surrounding the sizable lakes in the North of Mali. The Operation has suffered from a lack of financing.

While there has been a fairly elaborate development plan for the Operation in existence since 1973 and various efforts by government officials to interest international donors in the project area, there is currently no outside funding for the development effort. Consequently, the Operation is understaffed and able only to service a relative few of the villages in its jurisdiction.

There are currently 43 persons working for the Operation. Of this number, thirteen (13) are moniteurs. The Operation currently has active programs in four (4) lake areas or zones. Each zone is further divided into sectors, sub-sectors and finally "sectors de base". It is at the lowest level that the moniteurs are employed. They are supervised by the "chef de vulgarization", i.e., the head of the extension program for the Operation. The moniteur works at the village level and is responsible for communicating the program of the operation to the village farmers.

The principal crops produced by the farmers in the Operation are rice, sorghum and corn. At the present time, there appears to be little in the way of technical packages being promoted by the Operation. One assumes that this is due to the lack of funding for the Operation. The impression that one gets is that the Operation is currently maintaining only a skeletal staff including the moniteurs in the villages and that this staff is currently providing only minimal services to the villages. There is currently no innovative technical packages being pro-

moted. Without a technical package and the resources to promote it, the moniteurs seem to be having little effect on the way that agriculture is being practiced in the villages.

Key officers of the Operation were questioned concerning their criticisms of the current training program for agricultural moniteurs. The consensus was that the current program left much to be desired--the CAA graduates were judged to be ill-equipped to function effectively in the region. Several types of deficiencies were noted.

First of all, it was pointed out that the CAA graduates lack technical knowledge which is important to agriculture in the region. Specifically mentioned was lack of knowledge about hydrology, seed treatment and preparation and grain storage. All seem to be crucial problems in the area, problems faced by many if not most of the farmers. It was reported that when farmers sought help with these problems the moniteurs were unable to provide help. The moniteur lost credibility as the village expert in agriculture.

A second type of problem noted was that many of the moniteurs hired by the Operation could not speak the language of the area, primarily Sonrhai. This resulted in the moniteurs being largely ineffective in the villages. They could not communicate directly with most of the farmers. The officials of Operation Lacustre indicated that the CAA students should receive training in national languages.

A third criticism given was that the moniteurs lacked the

necessary skills in extension. They did not know how to relate to peasant farmers or how to explain basic agricultural knowledge and techniques. It was suggested that the CAAs place much more emphasis on extension techniques, especially teaching the students the necessary psychology for dealing with farmers. It was noted that technical knowledge is of little use to the moniteur unless he can effectively communicate it to the villagers.

Finally, the third-year practicum received special criticism from the officials of Operation Lacustre. They pointed out that most of the moniteurs had done their third-year at sites other than Operation Lacustre. It was noted that the training received at other sites is little value for preparing the students to work in Operation Lacustre. It is important to learn something about the milieu in which the moniteur is going to work. It was suggested that the third-year students be placed in the same operation in which they will later be employed.

When questioned about the projected needs of the Operation for moniteurs over the next ten years, the officials of the Operation reported that about 50 additional moniteurs were needed. This projection was based on the assumption that the project would be able to obtain funding and expand the involvement of the Operation to the other lakes in the region. Currently, funding is being sought from the Federal German Republic and the World Bank. Unless, funding is found there is little chance that the Operation will expand. Likewise, without additional funding there will probably not be any need for additional moniteurs.

This uncertainty makes it extremely difficult for the CAAs to plan. Therefore, the situation at Operation Lacustre should be carefully watched so that the enrollment at the CAAs can be adjusted in terms of the actual needs as they develop.

When asked about the Operation's attitudes toward monitrices, the officials reported they currently there was no places for monitrices in their organization. They indicated that farming is a male occupation in the region and that women only play the role of helper during certain periods such as planting and harvest. It was also reported that the living conditions were extremely difficult in the region and that that would preclude the use of women as monitrices. (It should be noted that this point should not be taken very seriously since women regularly live in the region and are a part of the work situation.)

In conclusion, Operation Lacustre is not currently a major employer of graduates of the CAAs. However, if major funding can be located for the Operation there will be a need for 50 additional moniteurs. The major criticism of the current training is that the graduates are not adequately equipped to deal with the problems of farmers in the region.

Institut d'Economie Rurale

The Institut d'Economie Rurale is headquartered at Sotuba and performs the major portion of agricultural research conducted in Mali. Moniteurs are employed by the agronomic section of the Institut. The Institut has received and receives funding from a number of sources including the World Bank, USAID and the F.E.D.

Research is carried out on a number of crops including grains, vegetables, cotton, tobacco, fruits, tea and dah. There is no concern with production for extension purposes. It is solely a research endeavor.

Currently, 52 moniteurs are employed by IER. They typically serve as Chef de Culture and supervise the field operations associated with a particular crop. The officials at IER indicated that they were satisfied with the performance of the moniteurs. They noted that most moniteurs had spent their third year practicum at IER and had received training in a speciality during that year. The third year served to orient the CAA student to the IER and prepare him to function effectively in the organization. It was emphasized that much of the students' learning took place during that third year.

The projected need for moniteurs over the next five years was projected to be 6 or 7 per year or about 33 for the total period. It was noted that actual needs were largely dependent on funding for research projects.

The officials also indicated that about 15 monitrices could be employed over the next five years. They would be utilized in research dealing with vegetable production.

Genie Rural--Division du Machinisme Agricole

This division has the responsibility for the mechanization of agriculture in Mali. It services each of the Operations. Currently it employs only four moniteurs and indicates that at most, it could utilize only two additional moniteurs per year

over the next five years--ten total. However, it has potential to be extremely important in the training of future moniteurs at the CAAs. It operates a training center in farm mechanization at Samanko. Given the expressed need of almost all of the agricultural Operations for increased training in farm mechanization for future moniteurs, perhaps this training center could be utilized for a short course in farm mechanization during the second year at the CAA.

The Director of this division indicated that very often peasants are anxious to use various pieces of farm equipment, but the moniteurs cannot teach them, because they themselves do not know how to operate them.

Direction Nationale des Eaux et Forets

The Direction Nationale des Eaux et Forets has jurisdiction over water and forest resources in the country. It has concern for a wide range of activities including forestry research, fisheries(Operation Peche), a National Park and a training school. Most of the Direction's work is done through regional offices. The researcher visited both the National Direction and the regional offices, as well as the training center at Tabakoro and the headquarters for the National Park.

The Direction currently employs 173 agents, known as pre-poses des eaux et forets.. These agents have two years of training at a CAA and then a year at the Centre de Specialisation Forestier at Tabakoro. The agents provide primarily a police

function, protecting the natural resources from abuse. Secondly, the agents engage in extension activities, teaching the villagers both the reasons for and the methods of conservation. It should be noted that the functions of the forestry agents seem quite different from those of the the moniteurs. Also, the types of knowledge needed varies significantly from that needed in most of the agricultural operations.

The major criticism voiced by the regional offices concerning the training of the agents was that it was not specific enough to forestry or to the region where the agents work. It was suggested that the future agents be given a curriculum which has more forestry and less general agriculture. Students should be trained in the milieu in which they are going to be assigned. Mali is a large country with several different ecological zones. It was suggested that the third-year practicum might be spent working in the region where the student will later be assigned.

A number of the regional officials noted that the agents lack skills in communicating with the peasants. They noted that much of the job of conservation is persuading the peasants that it is in their interest to practice conservation of the forests and waters. These skills are apparently weak in a number of the present agents.

The Third-Year training center at Tabakoro provides practical training to the students in forestry. The subjects taught are denology, topology, soil conservation and police and extension techniques. The training is very practical; the students spend a

lot of time working in the field. The training center can handle 20 to 25 students per year.

The National Direction indicated that they needed from 30 to 55 new agents each year over the next five years, a total of 220. While these needs seem to grow out of some master plan and are consistent with the needs stated in the regional offices, it should be noted that the Direction has been fairly stable over the last few years in terms of the number of agents employed. Bingen, in the Project Paper for the Agricultural Officers Training Project, reported that the Direction employed 190 agents in 1976 and projected the employment of an additional 54 by 1979. The Direction currently employs 173 agents, a fewer number than in 1976. Furthermore, the Center at Tabakoro can only accommodate 20-25 students per year or a maximum of 125 over the five year period. Given the relatively large projected need and the past growth experience it will be wise to closely monitor this Direction.

There was little support for the use of women as agents. It was noted that the work is difficult and not suited to women. The only possibility noted was for office work.

The Direction is a major employer of CAA graduates. More needs to be done to insure a better interface between the training the students receive at the CAA and the training at Tabakoro.

Centres d'Animation Rural (CARs)

The Centres d'Amnimation Rural (CARs) are training centers for farmers which are operated by the Direction Nationale de la

Formation et de l'Animation Rurales (DNFAR). The Centers are para-military in nature. Young men from the villages are sent to a center near his home to learn improved farming practices and military discipline.

During their entire history, these centers have been troubled with financial problems and therefore lack equipment and are unstaffed. Many of the centers are currently closed because of funding problems. Most of the regional offices, as well as the National Direction, indicated that there are plans to reopen the centers when funds can be found and the centers properly staffed.

The level of agricultural training provided at the centers appears to be rather minimal. Traditional farming techniques seem to be practiced. There seemed to be little cooperation with the agricultural operations concerning current technologies, etc.

Forty-eight moniteurs are presently employed at the CARs. They are used primarily as teachers. They also supervise the agricultural production at the schools. The officials interviewed indicated that the moniteurs appeared to have adequate training for the job.

There is a projected need of an additional 137 moniteurs. Once again, this is based on the number of vacant positions now existing, the reopening of closed centers and the opening of additional centers. Given the past financial problems of the CARs, it is doubtful that this number could actually be employed by the CARs even if they were available. Nevertheless, one should

carefully monitor this program in the future. Should it gain major funding, it could become a major source of demand for CAA graduates.

One aspect of the CARs which has recently received funding is that of mixed centers, centers where both young men and young women are trained. The funding is from the Federal German Republic and provides for the establishment of five mixed centers. Two monitrices will be employed at each of the centers. If this program is expanded it could serve to increase the demand for both monitrices and moniteurs in the CARs.

III. FINDINGS AND RECOMMENDATIONS

The officials, who were interviewed at the various Operations and Services where CAA graduates are employed, provided important information concerning their future needs, both quantitatively and qualitatively, for extension agents. They provided estimates of the number of CAA graduates they hope to employ in the next few years. Furthermore, in discussing the ways in which current employees are being utilized, they pointed to possible weaknesses in the current training system and offered suggestions for its improvement. A number of important findings can be summarized from the previous section. In turn, these findings suggest recommendations.

Manpower Needs for Moniteurs for the Next Five Years

The following table provides a summary of the projections of the number CAA graduates each Operation/Service plans to employ over the next few years. The table also contains data

PROJECTED MANPOWER NEEDS FOR MONITEURS D'AGRICULTURE

Employer	1976	Projected 1979	Actual 1979	Additional Projected 1984	Projected Total 1984
Action Ble	3	6	9	24	33
Action Riz-Sorgho	7	37	25	63	88
C.M.D.T	39	45	82	250	332
Office du Niger	45	90	85	68	153
O.A.C.V	64	73	72	38	110
Op. Baguineda	22	28	15	--	15
Op. D.I. Kaarta	4	10	51	39	90
Op. Haute Vallee	22	31	23	27	50
Op. Mils-Mopti	35	50	120	50	170
Op.Pro. Semances	--	--	12	7	19
Op. Riz-Mopti	22	38	36	25	61
Op. Riz-Segou	45	69	46	36	82
Op. V. Senegal	6	6	14	--	14
Op. The	--	--	7	15	22
Op. Lacustre	12	12	13	50	63
I.E.R	39	42	52	15	67
Genie Rural	2	20	4	10	14
Eaux et Forets	190	248	173	220	393
C.A.R.	<u>50</u>	<u>56</u>	<u>48</u>	<u>137</u>	<u>185</u>
TOTALS	607	857	887	1,074	1,961

NOTE! The 1976 and Projected 1979 figures were taken from R. James Bingen, "Report of a Study on Agricultural Manpower, Training and Extension in the Republic of Mali", USAID Contract No. 688-000-4, 1976, pages 13-14. The remaining figures are data reported to this researcher.

showing levels of employment in 1976 and projected 1979 levels (these data are from the Bingen report). Comparing the projected 1979 figures with actual employment in 1979 provides an indication of how realistic projections have been in the past and serves to help determine how much credence should be given to the projections for the future.

Comparing actual numbers of moniteurs employed in 1979 with the projected number shows that the projections were by and large on target. The Bingen report projected that the number of moniteurs employed by the Operations/Services would increase from 607 in 1976 to 857 in 1979. The actual level of employment of moniteurs in 1979/80 was 887, or 30 more than projected. Examining the data for the various Operations/Services, one should note that for several of them the actual employment figure deviated significantly from the projected one. It was projected that C.M.D.T. would be employing 45 moniteurs by 1979; the actual figure is 82. Operation Development Integre --Kaarta is employing 51 moniteurs rather than the 10 predicted. Also, Operation Mils-Mopti has employed substantially more moniteurs than projected, 120 rather than 50. On the other hand, Direction Nationale des Eaux et Forets actually decreased by 17 in the number of preposes employed rather than gaining an additional 54. Nevertheless, the projections in the Bingen report were, by and large, on target and suggests that one can give credence to the projections made for the next five years.

The Operations/Services indicate that an additional 1,074

moniteurs will be needed over the next five years. This, of course, is about two and a half times the number of graduates the three CAAs can produce during the period. Therefore, one should expect that there will remain a shortage of moniteurs in Mali in the near future. In the past, various Operations/Services have developed and operated training programs designed to upgrade encadreurs to the level of moniteur. Given the likelihood that demand for moniteurs in the near future will far exceed supply, one should expect this practice to continue.

A word of caution about the projections. A number of the stated needs were predicted on the assumption that the particular Operation/Service would obtain major funding from an international donor. If the funding does not occur, the demand for additional moniteurs will probably not exist. Therefore, officials at DNFAR should periodically monitor the financial situations of these Operations/Services and adjust their projected needs accordingly.

Given the rather fluid situation with regard to the funding of a number of Operations/Services, it is probably prudent for DNFAR to be prepared to adjust its admission in terms of anticipated demands for its graduates. If a number of the Operations retain funding and others obtain it, then DNFAR should probably consider increasing the number of students admitted to the CAAs. On the other hand, if the demand for its graduates begins to decrease, then the number of admissions should be lowered.

FINDING 1. The demand for CAA graduates over the next five year far exceeds the number of graduates which will actually be produced by about two and a half to one.

RECOMMENDATION 1. DNFAR should carefully and periodically monitor the demands of employers and adjust admission practices accordingly.

Job Assignments of CAA Graduates

A review of the various Operations/Services indicates that there is a diversity of jobs to which the CAA graduates are assigned. The most common job is that of extension agent, moniteur. This is the role given by most of the production Operations to the moniteur. In this type of employment, the moniteur serves as the interface between the Operation and the village farmers. He arranges for the agricultural inputs, delivers the technical packages of the operation and arranges for the commercialization of the crop. He uses standard extension techniques such as demonstrations and pilot farms and villages.

A second type of employment of CAA graduates is in jobs which are essentially police functions such as the job of prepose in the Division Nationale des Eaux et Forets. In this situation, the CAA graduate is not an extension agent. Rather, he enforces the rules and regulations designed to protect the natural resources. Any extension activities are secondary.

A third use of CAA graduates is in research jobs. The I.E.R. employs moniteurs in this capacity. The moniteurs, working with research scientists, carries out research activities on a given plot. He conducts trials, takes measurements, etc.

A fourth type of employment is that of supervisor of a

production unit in one of the Operations. Operation The uses moniteurs to supervise the labor on production units. A moniteur is in charge of the production on a given piece of land and supervises all of the labor associated with it. The moniteur plays a similar role in the Office du Niger with the production of sugar cane.

The fifth way that moniteurs are used is as teachers. The CARs use moniteurs to teach the basics of agriculture to young farmers. Moniteurs are also used in some teaching functions at the CAAs.

The curriculum and training at the CAAs should reflect the fact that the graduates will be employed in a number of different types of jobs. The third-year practicum is used to provide some specialization in terms of the types of job assignments the graduates will take. For example, the students who will work for the Direction Nationale des Eaux et Forets are sent to the Centre de Specialisation--Tabakoro to study forestry. Additional care should be taken in third-year assignments to insure that the students receive the types of experiences which conform to their future jobs.

FINDING 2. CAA graduates are employed in a variety of different types of jobs after graduation--extension, research, policing, supervision and teaching.

RECOMMENDATION 2. The educational and practical experiences provided the students at the CAAs should correspond to the type of job they will receive after graduation.

The Lack of Pratical Training

The almost unanimous choice of the major weakness in the

present CAA training program is that the education is not practical enough. Time after time, officials of the Operations/Services noted that the CAA training was too theoretical, the students lacked practical experience in agriculture. As a consequence, the moniteurs experienced difficulty performing their jobs. They were unable to demonstrate techniques, etc. to the farmers.

The suggestion was made by many of the officials that the students receive practical training in all aspects of agriculture and that the practical training be in terms of the types of agriculture. This practical experience should be with the various crops, various technologies, various extension techniques, etc. currently being practiced in Mali.

FINDING 3. CAA graduates lack practical experience in all aspects of Malian agriculture. The training is too theoretical.

RECOMMENDATION 3. The curriculum at the CAAs should be revised so that students receive practical experience in all aspects of Malian agriculture and that the experience be in terms of the crops, technologies and techniques currently practiced in Mali.

Training is not Specific Enough in Terms of Mileau or Crops

A number of respondents indicated that the training should be more specific in terms both of region and crops. It was noted that Mali varies significantly in ecological terms from the guinea zone in the South to the desert in the North. The type of agriculture practiced varies greatly in terms to the zones. It is not uncommon for a CAA graduate to be assigned to an Operation

in an ecological zone in which he has no experience and little knowledge. This hampers his effectiveness.

Likewise, very often the CAA graduate lacks experience with the particular crop being grown in the operation where he is assigned. If this is the case, he can hardly serve as an expert on the crop when dealing with the farmer.

The officials recognized that it is not economically feasible to operate a different CAA for each region and/or crop. The suggestion was made by a number of officials that the third-year could be utilized to provide the needed specificity.

FINDING 4. The training currently provided at the CAAs is not specific enough to the region or the crops to which the CAA graduates are assigned.

RECOMMENDATION 4. Using the third-year practicum, students be given experience in the ecological mileau and the crops to which they will be assigned. This could be accomplished by assigning him to the same Operation/Service where he will be employed after graduation.

Extension Techniques

Another criticism on which there was a great deal of agreement was that the CAA graduates lacked extension skills. Typically, it was said that they do not know how to communicate with the peasant. The moniteurs are unable to address agricultural problems in terms that the villagers can understand. It was suggested that the students should be taught have to translate scientific agriculture into terms that can both be undertook by the farmer and which address his problems.

Related to this point, it was noted that the CAA graduate

do not understand the psychology of the peasant. Therefore, he is unable to understand what motivates the peasant to adopt change, etc.

FINDING 5. CAA graduates currently employed in the Operations/ Services tends to perform poorly in extension activities.

RECOMMENDATION 5. The CAA's should provide the students with more training in extension techniques, including practice extending technologies currently employed by the Operations/ Services.

Training in Farm Mechanization

Another weakness in training which was mentioned by the officials was training in farm mechanization. A common complaint was that the CAA graduates did not know how to operate the range of farm equipment used in Mali. Not being able to use it themselves, they are unable to teach the farmers how to use it. It was suggested that special emphasis be placed on assuring that the graduates know how to operate and repair standard equipment. Emphasis was placed on machines used in animal traction and small pumps used in irrigation.

A possible solution would be to provide the students with a short course in farm equipments at the Farm Mechanization Training Center at Samanko which is operated by Genie Rural. This could be done sometime during the second year of study.

FINDING 6. CAA graduates lack proper training in farm mechanization. They are unable to teach farmers how to use and repair common farm equipment.

RECOMMENDATION 6. The CAA should modify its farm mechanization curriculum to include the operation and repair of all standard farm equipment in Mali. A possible solution is to establish a short course to be taught by personnel

from Genie Rural.

Communication Skills

A common problem mentioned, especially in the Fifth, Sixth and Seventh Regions, was that many of the moniteurs did not speak the languages of the area. Most of the moniteurs speak Bambara. Few speak Dogon, Peuhl, or Sonrhai. This makes it extremely difficult for them to function effectively in the villages. They are unable to do extension, to explain the program of Operation to the farmers, or to deal effectively with the problems of the farmers. A solution would be for the CAA to teach the national languages. If it could be determine where the student would be assigned after leaving the CAA, he could be taught the language of the area.

FINDING 7. Many CAA graduates do not speak the languages spoken in the areas where they are assigned.

RECOMMENDATION 7. Instruction in the key national languages of Mali should be added to the curriculum of the CAAs. Students should receive training in the language of the region to which they are going to be assigned after graduation.

Role of Monitrices in the Operations/Services

Most of the Operations/Services indicated an unwillingness to utilize monitrices. They indicated that the job and/or the mileau was too difficult for women. Most of those who indicated that they might hire monitrices said that they would be assigned to tasks that were different from those of moniteurs such as office work and community development projects.

Given the fact that the DNFAR is committed to the training of monitrices, some effort should be made to better define how