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SYSTEME DE SUIVI ET DE COLLECTE DE DONNEES POUR LE PROGRAMME DE REFORME DU SOUS-SECTEUR DES ENGRAIS

RAPPORT D'ACTIVITES

JUIN 1990

SYSTEME DE SUIVI ET DE COLLECTE DE DONNEES POUR LE PROGRAMME DE REFORME DU SOUS-SECTEUR DES ENGRAIS

RAPPORT D'ACTIVITES

Présenté au:
Comité de supervision technique
Gouvernement de la République du Cameroun

et

USAID/Cameroun

Juin 1990

Anthony Johnson, Agronome
Daniel C. Moore, Pédologue

PROJET DES STRATEGIES D'AMELIORATION DU MARKETING AGRICOLE

The Postharvest Institute for Perishables, Université d'Idaho

et

Abt Associates

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Note du traducteur: la traduction française comporte les mêmes références en annexe que l'original, toutefois ces annexes n'ont pas été traduites en français.

LISTE DES SIGLES

AMIS	-	Projet des stratégies d'amélioration du marketing agricole
DEAPA	-	Direction des enquêtes agroéconomiques et de la planification agricole
IFDC	-	International Fertilizer Development Center (Centre international pour la mise au point des engrais)
IRA	-	Agronomic Research Institute (Institut de recherches agronomiques)
MIDENO		Mission de développement du Nord-Ouest
MINAGRI	-	Ministère de l'Agriculture
MINPAT	-	Ministère du Plan et de l'Aménagement du territoire
PDRPO	-	Projet de développement rural de la Province de l'Ouest
PRSSE	-	Programme de réforme du sous-secteur des engrais
SAPD	-	Sub-Activity Programming Documents (Documents de programme d'une sous-activité)
TSC	-	Conseil de soutien technique
TSU	-	Unité de soutien technique
UCD	-	Centre universitaire de Dschang
USAID	-	Agence des Etats-Unis pour le développement international

INTRODUCTION

Données générales

Le consultant d'AMIS, M. Nick Minot, spécialiste des systèmes d'information a conçu un système de collecte de données pour répondre au besoin d'information du PRSSE. Ce système est appelé le "Système de suivi du PRSSE". 1/ Dans le cadre de ce Système de suivi, Monsieur Minot a proposé quatre activités visant à recueillir et à interpréter des informations concernant l'utilisation d'engrais dans les exploitations agricoles et les questions d'utilisation-efficacité. Ces activités sont les suivantes:

1) une série d'enquêtes initiales (au niveau de l'exploitation agricole) sur l'utilisation d'engrais au Cameroun;

2) l'exploitation des données d'enquêtes et de l'infrastructure de collecte de données existantes;

3) des essais agronomiques sur les réponses des cultures aux engrais; et

4) la collecte de données existantes sur les réponses de cultures aux engrais au Cameroun.

La conception du Système de suivi prévoyait que ces activités devaient être réalisées chaque fois que possible par des organisations camerounaises ayant les compétences nécessaires. Cela pouvait se faire dans le cadre de contrats adjugés aux organisations compétentes pour les travaux requis. Cette approche répondrait ainsi à la double fonction de générer les données nécessaires pour le PRSSE et de mettre en place et/ou de renforcer les capacités locales nécessaires pour exécuter ce type d'activités.

Pour réaliser ces travaux, les consultants d'AMIS, MM. Jerry Johnson et Nick Minot 2/ se sont rendus au Cameroun en juillet/août 1989. Pour les enquêtes au niveau des exploitations agricoles, Monsieur Minot a pris des contacts avec les organisations camerounaises capables de collecter et d'interpréter des données d'enquêtes, a mis au point les cadres méthodologiques et le questionnaire de l'enquête. Ces organisations sont la Mission de développement du Nord-Ouest (MIDENO), du Centre universitaire de Dschang (UCD), et la Direction des enquêtes agroéconomiques et de la planification agricole (DEAPA) du ministère de l'Agriculture. L'on avait d'abord proposé d'effectuer ces enquêtes fin 1989. Monsieur Minot a également pris contact avec la DEAPA, organisation chargée du recensement agricole national annuel, pour l'activité No 2 mentionnée ci-dessus.

1/ "Système de suivi et de collecte de données pour le PRSSE", projet AMIS, mai 1989.

2/ "Recherche sur les pratiques d'utilisation des engrais et les réponses des cultures" Projet AMIS, octobre 1989.

En ce qui concerne les essais agronomiques, Monsieur Johnson a collaboré avec les chercheurs à l'UCD et à l'Unité de recherche adaptative de la MIDENO pour élaborer des méthodologies convenant aux essais sur les réponses aux engrais. Les essais devaient être faits pendant la première saison de culture de 1990, commençant en mars. Enfin, examinant de plus près l'activité de collecte de données sur la réponse aux engrais, Monsieur Johnson s'est rendu compte que la collecte des données existantes sur les réponses aux engrais au Cameroun demanderait un effort bien plus important que prévu au départ. Il a donc proposé la création d'une Base nationale de données sur les réponses aux engrais, définissant en gros la base de données et faisant des recommandations pour sa mise sur pied.

Activités actuelles

Les consultants d'AMIS, MM. Anthony Johnson et Daniel Moore sont arrivés au Cameroun à la mi-février 1990. La description des tâches de la consultation était 1) de continuer les activités du Système de suivi de 1990, 2) d'évaluer et de continuer à élaborer la Base nationale de données sur les réponses aux engrais et 3) de créer une capacité de coordination de recherche au sein de la nouvelle Unité de soutien technique (TSU) du Comité de Supervision technique (TSC) du PRSSE. L'Unité apporterait un soutien technique et une coordination continue aux activités du Système de suivi du PRSSE. Monsieur Johnson était au Cameroun (et Lomé, Togo) pendant environ quatre semaines en février et mars. Monsieur Moore y était pendant environ 17 semaines entre février et juin. La description des tâches de la consultation sont données en Annexe E.

Les tâches de Monsieur Johnson étaient principalement les suivantes: 1) définir les objectifs de la Base nationale de données sur les réponses aux engrais, 2) de contacter les organisations participants à la création de cette base de données, 3) de définir et d'étudier les divers aspects liés à la base de données, 4) d'avoir des discussions détaillées avec les experts de l'IFDC concernant la base de données et la possibilité de collaboration entre l'IFDC et le PRSSE et 5) de proposer une méthodologie pour la création de la base de données. Les tâches de Monsieur Moore étaient les suivantes: 1) finaliser et démarrer les enquêtes au niveau des exploitations agricoles, 2)suivre d'autres activités liées aux enquêtes, 3) suivre les propositions et activités relevant de la Base nationale de données sur les réponses aux engrais, 4) mettre en place une capacité de coordination de recherche au sein de l'Unité de soutien technique, 5) de concevoir une brochure d'informations générales sur le PRSSE, et 6) de récapituler les progrès et les recommandations de la consultation dans un rapport final. Une liste des personnes contactées par les consultants pour réaliser ces tâches est donnée en Annexe F du rapport. Une liste de la littérature consultée est incluse en Annexe G.

Le présent rapport traite de l'état d'avancement de chaque activité du Suivi auxquelles ont participé les consultants. La discussion portera: 1) sur l'état préalable de cette activité, 2) les progrès faits pendant la consultation, 3) la situation actuelle de l'activité, 4) les étapes futures nécessaires pour faire progresser ou suivre l'activité, dont les recommandations des consultants. L'ordre de la discussion est le suivant: 1) enquêtes sur l'utilisation d'engrais, 2) activités liées aux enquêtes, 3) essais agronomiques, 4) Base nationale de données sur les réponses aux engrais et 5) "autres activités".

La situation des activités de 1990 est récapitulée ci-après.

RECAPITULATIF DE LA SITUATION DES ACTIVITES DU SYSTEME DE SUIVI 1990

ACTIVITES	ORGANISATION D'EXECUTION	SITUATION
Enquêtes au niveau des exploitations agricoles		
Détaillée, Province du Nord-Ouest	MIDENO	prévue début juin
Détaillée, Province de l'Ouest	UCD	prévue début juin
Générale, sept provinces	DEAPA	prévue début juin
Sources Existantes		
Analyses de la Base de Données du Recensement	DEAPA	besoin d'approbation du SAPD
Modification du questionnaire	DEAPA	suivi nécessaire fin 1990
Essais agronomiques		
Province du Nord-Ouest	MIDENO	en attente pour 1990
Province de l'Ouest	UCD	en attente pour 1990
Collecte de Données		
Base de données sur les réponses aux engrais	collaboration	mission préliminaire commence en 9/1990

PREMIERE PARTIE: ENQUETES SUR L'UTILISATION DES ENGRAIS

Trois enquêtes sur l'utilisation des engrais dans les exploitations agricoles ont été prévues pour 1990. Au départ, elles avaient été prévues pour fin 1989 mais on les a remises à plus tard suite à la non-disponibilité de fonds pour ces activités. Au moment de l'arrivée des consultants, les négociations entre le PRSSE et les organisations qui allaient réaliser ces activités d'enquêtes en étaient à diverses étapes. Un questionnaire avait également été conçu pour l'enquête, et avait été modifié en fonction des commentaires reçus de diverses sources. Ce questionnaire est inclus dans l'Annexe B. Deux des enquêtes allaient être des enquêtes de niveau provincial "détaillées" (Provinces du Nord-Ouest et de l'Ouest) alors qu'une troisième de nature plus générale allait couvrir les sept provinces participant au PRSSE.

1.1 Enquête dans la Province du Nord-Ouest

En février, les consultants ont contacté le personnel de la MIDENO pour examiner la situation concernant "l'enquête sur l'utilisation des engrais dans la Province du Nord-Ouest". Bien que la MIDENO n'était pas au courant de la situation de l'enquête puisqu'on ne les avait pas contactés, ils étaient tout à fait prêts à participer au projet si celui-ci était remis pour 1990. La plupart de la méthodologie de recherche et des modalités financières ayant déjà été discutées entre Monsieur Minot et la MIDENO, on a pu rapidement finaliser le protocole et les budgets de recherche. Un document de programme d'une sous-activité (SAPD d'après le sigle anglais) a été préparé, traduit et soumis à la MIDENO aux fins d'approbation et pour une "lettre d'engagement". Le document a été approuvé par le TSC et l'USAID à la fin de mai. Puis, la MIDENO a transmis un numéro de compte au TSC pour faire un transfert direct des premiers fonds nécessaires à la réalisation de cette activité.

L'enquête avait été d'abord prévue mi-mai. Mais les retards pris pour créer le Fonds de suivi qui finance l'activité et le déblocage final des fonds ont retardé le démarrage des travaux de l'enquête. Il faudra tenir compte de ce retard si la MIDENO a des problèmes à présenter le rapport d'enquête final à la date spécifiée dans le protocole de recherche. Il faudrait du moins lui accorder le même nombre de jours que les retards pris pour débloquer les fonds, par rapport à la date d'achèvement prévu.

1.2 Enquête dans la Province de l'Ouest

En février, les consultants ont contacté le personnel de l'UCD pour discuter de la situation concernant "l'enquête sur l'utilisation des engrais dans la Province de l'Ouest". Comme pour la MIDENO, l'UCD n'était pas au courant de la situation concernant l'enquête puisqu'on ne les avait pas contactés. Mais, eux aussi étaient prêts à faire l'enquête en 1990. Mais contrairement au cas de la MIDENO, la méthodologie et les modalités financières n'étaient pas encore très élaborées, et il a fallu tenir d'importantes négociations. En outre, Monsieur Minot avait proposé initialement que l'UCD collabore avec le Projet de développement rural de la Province de l'Ouest (PDRPO) pour avoir accès à leur infrastructure de collecte de données. Les modalités de cette collaboration n'avaient pas encore été mises au point.

Plusieurs réunions ont été tenues entre l'UCD, le PDRPO et les consultants du PRSSE pour définir le protocole de recherche, la nature de la collaboration entre les deux organisations et le budget. En ce qui concerne la collaboration, l'on a décidé que l'UCD serait chargé de l'activité dans son ensemble et que le PDRPO serait un sous-traitant. On a préparé un document SAPD qui a été traduit et présenté à l'UCD aux fins d'approbation et d'une lettre d'engagement. Le document a été approuvé par le TSC et l'USAID à la fin de mai. L'UCD a ensuite fait parvenir un numéro de compte au TSC pour un transfert direct des fonds de démarrage pour financer l'activité.

L'enquête avait d'abord été prévue pour début mai. Mais les nombreux retards pris pour mettre sur pied le Fonds du suivi qui finance l'activité et le déblocage final des fonds a retardé le démarrage des travaux de l'enquête. Il faudra tenir compte de ce retard si l'UCD a des problèmes à présenter le rapport d'enquête final à la date spécifiée dans le protocole de recherche. On devrait au moins donner à l'UCD le même nombre de jours que le retard pris pour débloquer les fonds, par rapport à la date d'achèvement prévue initialement.

1.3 Enquête dans les sept provinces

En février, les consultants ont contacté la DEAPA pour discuter de la situation concernant "l'enquête sur l'utilisation des engrais dans les sept provinces". La DEAPA n'était pas au courant de la situation concernant l'enquête mais était tout à fait prête à réaliser cette enquête en 1990. La méthodologie de l'enquête n'avait pas encore été vraiment élaborée et il a donc fallu tenir d'importantes négociations. De plus, le budget et les autres modalités financières n'avaient pas encore été discutés.

Plusieurs réunions ont pris place entre la DEAPA et les consultants du PRSSE pour définir le protocole de recherche et établir un budget. On a préparé un document SAPD qui a été traduit et présenté à la DEAPA aux fins d'approbation et d'une lettre d'engagement. Le document devrait être approuvé par le TSC et l'USAID au début juin 1990. La Caisse autonome d'Amortissement (CAA) pourra ouvrir un compte pour l'activité au nom de la DEAPA, où l'on pourra verser la première partie des crédits du contrat.

L'activité de l'enquête devait commencer fin juin. Mais les nombreux retards pris pour la mise sur pied du fond de Suivi qui finance l'activité et le déblocage final des crédits ont retardé le démarrage des travaux de l'enquête. Vu les besoins du PRSSE, le rapport final doit quand même être remis avant le 31 décembre 1990.

DEUXIEME PARTIE: ACTIVITES LIEES AUX ENQUETES

2.1 Modifications portées au questionnaire de recensement

Pour mieux suivre les changements prévus dans le sous-secteur des engrais, on a proposé à la DEAPA de porter certaines modifications au questionnaire de recensement agricole annuel, surtout les aspects relevant de l'utilisation des engrais. Une proposition a été présentée à la personne chargée au sein de la DEAPA de formuler le questionnaire (M. René Mbappou), qui a proposé de modifier deux questions et d'en rajouter une troisième au questionnaire "type" utilisé pour les formulaires 2 et 3 des recensements de 1984 à 1989. (Le questionnaire du formulaire 1 ne comporte aucune question se référant aux engrais). Une copie de cette proposition est incluse en Annexe C.

La réponse aux modifications proposées a été positive. Mais vu que les travaux de collecte de données de 1990 seront différents des années passés et vu que la DEAPA songe actuellement à reformuler certaines de ces approches méthodologiques, il faudra veiller à ce que les modifications proposées soient bien prises en compte. Le recensement de 1990 se concentrera surtout sur les cultures vivrières. Il n'y aura pas de questions spécifiques liées à la production des cultures d'exportation. Le questionnaire de formulaire 1 (première série d'enquêtes) sera administré en août ou septembre 1990. Ce questionnaire est déjà formulé. La seconde série de l'enquête (formulaire 2) se déroulera aux environs de janvier 1991 et comportera les questions sur l'utilisation d'engrais.

La conception du questionnaire de formulaire 2 se fera après la collecte des données du formulaire 1 et le contrôle de qualité en octobre. A ce moment là, la personne chargée de formuler le questionnaire devrait être recontactée pour être sûr que l'on tienne compte des modifications proposées. Si elles sont adoptées pour le questionnaire de formulaire 2, les mêmes questions devraient être portées sur le questionnaire de formulaire 3. Puis, suivant que l'on juge ces changements utiles ou non, les questions pourraient être intégrées aux futurs recensements couvrant aussi bien les cultures vivrières que les cultures d'exportation.

En ce qui concerne "l'enquête spéciale" de 1990 qui se concentre sur les cultures vivrières, outre la collecte de données plus détaillées sur les tendances dans la production des cultures vivrières, deux questions générales pouvant fournir des informations valables seront posées sur la production des cultures d'exportation sur le questionnaire du formulaire 1. Pour les cultivateurs de chaque culture d'exportation (arabica, robusta, cacao et coton), les deux questions sont les suivantes: 1) "Selon vous, la rentabilité actuelle des cultures d'exportation comparée à celle des cultures vivrières est: (choisissez) meilleure, la même, pire" et 2) "Selon vous, la prochaine récolte des cultures d'exportation comparée à la dernière sera: (choisissez une réponse) meilleure, pareille, pire". Les données collectées grâce à ces deux questions permettront de voir s'il y a tendance vers la production de cultures alimentaires plutôt que de cultures d'exportation.

2.2 Analyse complémentaire de la base de données de recensement

Lors de la conception initiale du Système de suivi du PRSSE, M. Minot avait proposé que les données collectées dans le cadre du recensement agricole annuel soient utilisées pour répondre à certains des besoins d'informations du PRSSE. Pour cela, on pourrait faire des tableaux croisés de données provenant de la base de données du recensement. Au moment de la présente consultation, ces travaux n'avaient pas encore commencé.

M. Moore a exploité l'idée de M. Minot et est allé plus loin suggérant d'autres types de tableaux pour compléter les tableaux croisés et a aussi émis l'idée d'une proposition informelle présentée au personnel de la DEAPA chargé du traitement des données. Lors de réunions ultérieures avec ces personnes, l'on a défini le type d'analyses complémentaires qui seraient possibles et un document SAPD a été rédigé début juin. M. Moore pense que ces analyses vont dégager une quantité importante d'informations utiles et qu'il est donc très important de suivre cette activité. Si la DEAPA est très ouverte à l'idée de faire ces analyses, puisque cela fait partie de leur futur mandat, il est difficile de passer à des accords concrets vu qu'ils sont déjà débordés de travail actuellement. Mais un document a été créé pour cette activité et présenté aux fins de discussion au personnel impliqué. Une copie du protocole de recherche le plus récent et une liste des analyses suggérées sont incluses en Annexe D1 et D2.

Au titre du suivi de cette activité, le coordinateur technique du TSU pourrait notamment: 1) contacter le membre du personnel de la DEAPA, M. Agoum Anabel (Chef de la Section de traitement de données) et M. Jim Otto (Conseiller-gestion de données CAPP), et 2) prendre les étapes nécessaires pour finaliser les accords et faire un calendrier d'exécution des analyses (finaliser le document SAPD). Une demande officielle a déjà été déposée auprès du Ministre de l'Agriculture pour permettre à la DEAPA de collaborer avec le PRSSE. En ce qui concerne le soutien financier de la part du PRSSE pour cette activité, vu que le projet proposé entre dans le mandat de la DEAPA, la commission par tableau prévue au départ ne devrait pas être nécessaire. Mais le PRSSE devrait apporter un soutien financier pour les fournitures (logiciels, disques, etc.).

TROISIEME PARTIE: ESSAIS AGRONOMIQUES

Si le PRSSE apporte un soutien aux essais agronomiques comme il est prévu dans la conception du Système de suivi, cela permettrait d'une part, 1) de générer des données utiles sur les réponses des cultures aux engrais et, d'autre part, 2) de mettre en place une capacité au sein des organisations camerounaises pour qu'elles puissent réaliser des essais de réponse des engrais dans les exploitations agricoles mesurant les changements dans les conditions économiques et agronomiques. Le dernier aspect consiste notamment à acquérir plus d'expérience dans les essais de "surface de réponses" et les analyses comme celles conçues par le consultant du PRSSE, M. J. Johnson, conjointement avec la MIDENO et l'UCD. Les retards pris pour la mise en place du Fonds de suivi qui finance ces essais a valu que les travaux soient ajournés jusqu'en 1990. En outre, l'on s'est demandé si le soutien à de tels travaux revenait effectivement au PRSSE. Les consultants ont averti la MIDENO et l'UCD que les essais avaient été remis à plus tard, probablement l'année à venir.

Vu la création imminente de la Base nationale de données sur les réponses aux engrais, la réalisation de ces essais semble plus logique qu'avant pour les mêmes raisons que nous venons de mentionner. En plus, certains essais de vérification pour les recommandations concernant les engrais seraient utiles afin de tester les méthodologies employées pour interpréter les données de la Base nationale. Par conséquent, on recommande que les essais sur les réponses aux engrais qui avaient été prévus pour la campagne de 1990 (qui commence en mars) soient remise à la campagne de 1991, et exécutés par les mêmes organisations proposées au départ.

Si l'on décide de réaliser ces essais, il est impératif que les activités démarrent au plus tôt pour disposer du temps nécessaire à l'obtention des fournitures nécessaires; cela veut dire qu'en août ou septembre 1990, une décision doit être prise pour qu'on puisse prendre les arrangements nécessaires. La méthodologie et les coûts de recherche pour les essais de la MIDENO avaient été mis au point de manière assez précise par M. J. Johnson. 1/ Par ailleurs, la méthodologie de recherche envoyée par l'UCD au PRSSE se fondait sur une approche différente de celle prévue au départ. Les deux consultants s'accordent pour dire que l'autre approche est viable et vu que c'est ainsi que les chercheurs de l'UCD semblent aborder le problème, c'est une justification suffisante pour financer la proposition de recherche. Toutefois, il faut négocier un budget raisonnable.

1/ "Pratiques d'utilisation des engrais et recherche sur les réponses de cultures", Projet AMIS, octobre 1989.

QUATRIEME PARTIE: BASE NATIONALE DE DONNEES SUR LES RÉPONSES AUX ENGRAIS

Le concept originel de réunir des données sur les réponses aux engrais pour le Système de suivi a débouché sur un projet de Base de données techniques qui à présent s'est actualisé en une proposition et un plan d'action concret. Mais la direction et l'ampleur en grande partie de la Base nationale de données sur les réponses aux engrais restent à être définies pendant la "mission préliminaire" proposée et plus tard. Les consultants ont passé beaucoup de temps à contacter les institutions (MINAGRI, MINPAT, IRA, NSC, MIDENO, UCD, NCRE, et USAID), à tester les hypothèses, à explorer les possibilités et à formuler un plan d'action pour la mission préliminaire. Les résultats de ces efforts sont donnés dans les Annexes ci-jointes (Annexes A1 à A5 de l'anglais) qui donnent tous les détails du projet de la Base nationale de données sur les réponses aux engrais, y compris les données générales, les hypothèses, les divers aspects, les recommandations, les ensembles de données, et les sources de données.

Ceux appliquant les recommandations faites par les consultants devront se rappeler qu'au fur et à mesure que viennent s'ajouter de nouvelles informations, il serait judicieux de modifier le plan d'action. A ce titre, les recommandations ne sont que des directives et n'ont pas une "recette à suivre à la lettre" pour créer la Base de données.

CINQUIEME PARTIE: AUTRES TACHES

A part le Système de suivi décrit ci-dessus, deux autres tâches entraient dans le mandat des consultants. Il s'agissait de 1) la création d'une capacité de coordination de recherche au sein de l'Unité de soutien technique (TSU) du Comité de supervision technique (TSC), et 2) la conception d'une brochure d'informations sur le PRSSE aux fins de distribution générale. Plusieurs facteurs ont freiné l'avancement de ces tâches: 1) en ce qui concerne particulièrement l'Unité de soutien technique, il y a eu divers retards faisant qu'à la fin de la consultation, l'Unité de soutien technique n'existait pas encore officiellement, et 2) le fait qu'on a demandé aux consultants de fournir un soutien général au fonctionnement du PRSSE a fait qu'il ne restait pas assez de temps pour concevoir la brochure d'information.

ANNEXES

ANNEX A1

THE NATIONAL FERTILIZER RESPONSE DATABASE: CONSULTANTS' RECOMMENDATIONS FOR PROCEEDING

Introduction

A database is a collection of different categories of information related to a common experience. The NFRD for Cameroon will consist of information collected as part of crop fertilizer response trials conducted in Cameroon. The fundamental unit of such information is the trial "data set"--the set of all available data for each fertilizer response trial. Data sets are organized within the database via a series of categories, or "fields". NFRD categories would include cropping system, soil, and climatic factors, economic factors, geographic and administrative factors, and those factors related to trial results. Annex F outlines a "site-specific" data set for use in the NFRD and also defines "non site-specific" and "minimum" data sets. These terms will be used during discussion of the NFRD in this Annex.

Due to the quantity of information involved and the complexity of its manipulation, databases are usually created and managed through computers using specialized software. A database user with specific information needs may access that information by defining its desired characteristics within the database. The computer then searches the database for all information appropriate to the user's needs and provides it in a useable form, such as a printout. Databases such as the NFRD may serve many needs. For example, a researcher may require information on intercropped maize response to phosphorus on recent volcanic soils within an altitude range of 1500-1800 meters. Or, an economist may desire a list of all cost benefit analyses done on the response of arabica coffee to nitrogenous fertilizers. Or, a distributor may wish to know the most economical and commonly recommended fertilizers for all crops over a given region. The possibilities are endless--by selecting the desired information characteristics, each user may access all appropriate information contained within the database.

NFRD objectives

Reasons for the creation of the NFRD can be summarized through an enumeration of general, use-related, and long-term use objectives:

1. Centralization of all past, present, and future crop fertilizer response data generated in Cameroon,

2. Prevention of further decentralization and loss of data,

3. Provide access to database to multipurpose users with varied objectives and information needs;

a) provide extension services and agents with information appropriate for determining crop production strategies for given areas,

b) provide researchers with information useful in guiding research planning and the design of future fertilizer response trials,

c) provide economists with information appropriate to the assessment of the economic viability of fertilizer use,

d) provide planners, importers, and distributors with information useful in the forecasting supply and demand of fertilizer, and

e) provide farmers (via the above users) with the means of increasing the efficiency of their agricultural operations and thereby improve their overall welfare.

4. Long-term: Creation of a dynamic system of fertilizer "recommendation domains" by cropping system, soil, climate, etc., and

5. Long-term: Monitoring of changes in fertilizer response over time to quantify changes in soil fertility and assess the need for conservation interventions.

Assumptions

There have been several assumptions made by various people involved in the design of the FSSRP Monitoring and Data Collection System with specific bearing on the NFRD. Among these assumptions was that there is not an excess of fertilizer response data available in Cameroon, and that this data could be compiled easily and rapidly into useable forms. Our present knowledge indicates the contrary. First of all, there is an abundant amount of data on crop response to fertilization in the country. In addition, it is believed that the data are viable enough to warrant collecting and assembling into a database. Crop response data has been generated in Cameroon since the late 1940's as a result of the then growing international fertilizer industry and the economic viability of fertilizer use on commercial crops in Cameroon. However, the raw data generated from this research are not centralized and must be collected by going to the regions in which they were generated.

A second assumption made relates to the range of sources from which fertilizer response data would be present and available. Because we are interested in response data for all crops for which trials have been conducted, collection of data implicates not only agronomic research structures, past and present, but also private and parastatal companies. Additionally, fertilizer response data has been generated by bilateral and multilateral development programs and

projects, and international research institutions. The consultants have compiled a master list of Cameroonian public, parastatal, and private agencies, development programs and projects, and international research organizations that may be sources of information pertinent to the NFRD. This list is presented in Annex G.

A present, Cameroon lacks the technical capacity in the creation and management of a national database such as the NFRD. Therefore, the creation and ongoing maintenance of the NFRD will require outside technical assistance and the establishment of a cooperative link between the NFRD and an agency with able to provide ongoing technical "backstopping." Early in the planning of the NFRD, it was assumed that IFDC would be able to provide the necessary support for both its creation and backstopping needs.

Issues Raised

Issues associated with the planning for and creating of the NFRD have arisen from of the interaction between assumptions made and information gathered during pursuit of the NFRD concept. Following is a brief discussion of the status of the most important issues.

Technical Backstopping. At present, there are no functioning fertilizer response databases in Africa at a national level. National research institutions in Nigeria, Niger, and Kenya have indicated the need for the creation of such databases, but have not yet located support for doing so. IFDC-Africa is currently providing limited support in Togo for regional database construction with French technical backstopping. IFDC-Africa considers the development of such databases a priority in terms of fulfilling their mandate for the African continent but at present has no donor support to create such a capacity within their own institution. This means that technical expertise and support available for the creation, management, use, and backstopping of the NFRD is limited. As such, the success of the NFRD will depend on the identification of the required expertise and backstopping capability.

Data Collection. In order that the NFRD fulfill its envisioned role, it is necessary to include within individual datasets the "raw data" generated from fertilizer response research. That is, data from the smallest experimental unit of the trial must be collected. Access to this raw data may be problematic. It is relatively easy to locate documents that report "summary data" (e.g. treatment means) and conclusions, but in general it is not standard practice to report fully the raw data in such documents. Problems in accessing raw data from previous trials are an unknown at present. Factors that influence accessibility should include: 1) time elapsed since conduction of the trial, 2) administrative status of the conducting organization, 3) continuity of international research organizations, and 4) the familiarity of members of data collection teams with previous and ongoing research.

Data Sets. Minimum and site-specific data sets must developed for use by data collection teams. These sets will be used to determine whether data should be collected, and if so, which data. An explanation of data set concepts is included in Annex F. The Action Plan section recommends that a committee be formed for further defining data sets. In addition, potential sources of non-site specific data should be identified. Non-site specific data would include economic data (fertilizer prices, harvested product value), soils information (see below), climatological information, and agronomic information including management factors and crop yield form (see below).

Crop Yield Data. Crop yield data should be based on the utilized plant parts and maturation stage at harvest. Harvest form varies by cropping season, farms, agroecological zone, and plant variety. For example, in the semi-humid forest areas is often cultivated for fresh (green) consumption and sales, whereas in the highlands maize is generally consumed and marketed as dried grain. However, researchers often convert all yields to a common form as it serves the need for extrapolation of results. This issue must be addressed for several crops in addition to maize, because fertilizer response will be partly a function of maturation stage at harvest. The suggested approach would be to enter two yield forms in different database categories; 1) yield based on utilized plant part and/or maturation stage at harvest and 2) "common" yield unit. Such an approach would allow for a greater flexibility of database use.

Soils Information. Soil resource information (e.g. soil maps) exist at varying levels of detail (scale) for the entire country, using three different soil classification systems (French/CPCS, FAO/UNESCO, and USDA "Soil Taxonomy"). For the purpose of providing information for inclusion in the database and for use in helping to define fertilizer recommendation domains, soils information must be both detailed and consistent. The issue of detailedness of information cannot be specifically addressed but rather the NFRD must rely on existing soils maps and information, both published and unpublished. However, the problem of commensurating the different classification systems can be addressed by developing strategies for interpreting and exploiting information common to the three systems.

Scope of NFRD. The creation of the NFRD was originally proposed as part of the solution to the data collection needs of the FSSRP, a project whose mandate covers the seven "southern" provinces of Cameroon. The excluded provinces, the Far North, North, and Adamaoua wholly comprise two of Cameroon's five agroecological zones (the Sudano-Sahelian and Guinea Savanna zones) and account for a large portion of national fertilizer consumption. Furthermore, a large volume of agronomic research on fertilizer response is known to have been conducted in these provinces. Considering these factors, along with its foreseen role, the NFRD should be truly "national" in scope with a mandate for covering all of Cameroon's ten provinces.

Location. Facility for the creation, management, update, use, and safekeeping of the NFRD must be considered in determining the physical and administrative structure in which the database is to be housed. This issue must be well considered before any data collection is done. Several factors must be examined in determining where the database should be located and by whom it should be managed: 1) Infrastructural capacity in computer technology and ability to maintain a clean, dry and safe environment for the necessary hardware and software; 2) Institutional capability in terms of availability of trained (or trainable) personnel to manage the database; 3) Ability and willingness to work and coordinate with other implicated institutions and individuals, including the FSSRP and USAID; 4) Professional proximity to data and data sources; 5) Interest in the data and database use; 6) Convenience of access for the envisioned users; 7) Participation in the development of the NFRD; and 8) Issues relating to the sustainability of the database after the life of the FSSRP.

Options

Viable options for proceeding towards full realization of the NFRD must address the issues discussed above. It is recommended by the consultants that a "step-by-step" approach towards creation of the database be taken so that the feasibility of the NFRD can be continuously assessed and the database can evolve as is appropriate and possible. The recommended option is largely a product of discussions held between consultant Anthony Johnson and IFDC/Lomé personnel. A summary of these discussions is included as Annex D.

Preliminary Mission

The first step towards the creation of the NFRD should be to conduct a four-week preliminary "reconnaissance" mission involving a team consisting of technical assistance from IFDC and representatives of the FSSRP, USAID, and implicated domestic organizations. The mission would be conducted to assess further the feasibility of the NFRD. Overall objectives of the mission will be: 1) to assess the quantity and quality of existing data; 2) to formulate an appropriate database design; 3) to define and address necessary training components in database management and formulation of fertilizer recommendations; and 4) to define subsequent steps to be taken in creation of the NFRD. The mission should take place between September 17 and October 12, 1990.

The preliminary mission will approach these objectives through an exercise in data collection and database construction that targets specific crops and crop associations in two of Cameroon's agroecological zones; maize and maize-based associations in the Highlands zone, and millet and sorghum and associations based on millet or sorghum in the Sudano-Sahelian zone. The two zones represent major production areas in Africa, and are different enough from one another to obtain an introduction to the types of problems

that may be encountered in the remaining agroecological zones. Furthermore, it is known that significant amounts of fertilizer response data have been generated for these crops in their respective zones. The advantage of focusing on a representative, reliable subsample of Cameroon's cropping systems and agroecological zones will be to provide a easily manageable quantity of data to work with. The mission should be focussed fully on the objectives stated (see Scope of Work, below) and not become overly involved in data collection activities. Techniques and recommendations developed through the mission could then be employed across the full range of cropping systems and agroecological zones.

Recommended Preliminary Mission Team

The following persons are recommended for participation in the overall preliminary mission. Other individuals may be requested to participate in various aspects of the mission as deemed appropriate.

1. IFDC Biometrician (Julio Henao)
2. IFDC Agricultural Economist (Jacob Teboh)
3. NSC Soil Scientist (Joseph Bindzi-Tsala, head of NSC, or another representative, e.g. Jean Kotto-Same (soils research advisor), Martin Tchienkoua, or Louis Ambassa-Kiki
4. IRA Agronomist
5. NCRE Agronomist/Agricultural Economist (Tom Stilwell or another)
6. IRA, NSC, or MINAGRI representative (plant breeder or agronomist)
7. Technical Coordinator, TSU (John Molu)
8. Representative of USAID (AMIS Consultant)

Responsibility for coordination of the mission will be with the technical coordinator of the TSU and the AMIS consultant contracted by the FSSRP.

Contact persons for each agroecological zone will be useful for the team. This person will work with the preliminary mission in his or her zone to help identify data sources and contact current research and development workers. In the Highlands zone, George Yebit, agronomist with the Adaptive Research Unit of MIDENO, has indicated that he would make himself available. Mr. Yebit would be ideal because of his role in liaising between research and development programs in the North-West Province. Dr. S.N. Lyonga should be contacted for additional help in the West Province. Dr. Lyonga is head of the Agriculture Department and Research and Extension Coordinator at UCD. No contact person has been identified in the Sudano-Sahelian zone but the mission preparation should include contact with SODECOTON personnel, Dr. Boli (IRA head of the Maroua research station), and Dr. Henri Talleyrand (Garoua cereals agronomy section, NCRE). These sources should be able to indicate a suitable contact person in the Sudano-Sahelian zone to work with the preliminary mission.

Preliminary Mission Scope of Work

The preliminary mission has an agenda that includes both broad and specific items that lead towards the creation of the NFRD. The scope of work of the mission will consist of the following tasks:

1. Gather raw data from on-farm and on-station fertilizer response trials and demonstrations for the selected crops in the two zones, according to the minimum and site-specific data sets recommended. Based on the amount of data collected, estimates will be made to determine the required capacity the database.

2. Training of appropriate personnel (or arrangements made to this end) to assure continuity in the creation and ongoing management of the NFRD. Training components should include; 1) data collection, 2) data entry, 3) database design, management, and update, 4) analyses of available data for a specific objective (e.g. the formulation of fertilizer recommendations). Given the paucity of available expertise in the creation and management of such a database, it is important to look ahead to what will remain after the preliminary mission. The mission must produce tangible products in these training components if the database is to proceed and evolve.

3. Design of a database appropriate for Cameroon based on collected data. This should include the identification of necessary computer hardware and software. This task should be associated with task #2.

4. Formulation of fertilizer recommendations for selected crops and crop associations (maize, millet, sorghum). This task should be associated with task #2.

5. Evaluate potential problems in gaining access to remaining (non-collected) raw data. Make recommendations for solutions to overcome these problems.

6. Make final decision on site-specific and minimum data sets to be used in data collection efforts for the NFRD.

7. Identify data sources and methodologies for the incorporation of non-site specific data into the database. The following issues must be addressed; 1) determination of economic data for inclusion, 2) farm management factors that influence fertilizer response should be identified, along with methodologies of accounting for them, 3) "other" farming systems data not necessarily part of the raw data (including soils and climatological data).

8. The final product of the mission should be a "skeleton" of the NFRD. This skeleton should be functional so that subsequent

data collection missions can eventually incorporate remaining data on an national scale.

9. Information generated in addressing the issues raised and performing the enumerated tasks should be summarized in a final document. Based on what is learned from the mission, the team should make recommendations as to how to proceed with the NFRD, including the development of budgetary estimates for ongoing data collection and entry, database management, technical training requirements, and other costs associated with the NFRD.

Action Plan for Proceeding

The following is an enumeration of the steps necessary for the realization of the recommended option. The steps are divided into three periods; 1) preparation for preliminary mission, 2) preliminary mission, and 3) follow-up on the preliminary mission. The efficiency of the preliminary mission will depend to a large extent on the degree of preparation for the mission. It is therefore critical that the preparatory steps be addressed fully so that the preliminary mission team can operate in its intended capacity. The TSU should be responsible for ensuring that all preparatory steps are taken.

Preparation for the Preliminary Mission

1. Letters have been sent by the President of the TSC to the Directors of IFDC/Muscle Shoals and IFDC/Africa (Lomé) explaining the FSSRP, the NFRD, and the proposed preliminary mission. The letters requested the participation of biometrician Julio Henao and an agricultural economist (likely to be Jacob Teboh) from Muscle Shoals and Lomé, respectively. Henao has been contacted and his availability assured for the proposed mission period.

2. Based on the response to the letters to IFDC, the availability of the two proposed individuals must be confirmed. The nature of the collaboration between IFDC and FSSRP must also be defined, so that contracting and travel arrangements can be made.

3. A consultant to represent USAID and assist in the coordination of the mission should be located. It is imperative that the consultant have knowledge of fertilizer response research in Cameroon and be familiar with the agencies involved in such research, as well as the agencies that will be directly involved in the NFRD. Several AMIS consultants utilized by the FSSRP in the past should possess the required capacity.

4. Copies of this report should be sent to both implicated IFDC personnel and the USAID consultant for solicitation of comments as to the structure of the mission, its agenda, and the preparatory steps. Copies should also be made available to

mission participants as well as representatives of organizations to be contacted during the mission (IRA, NSC, NCRE, MIDENO, etc.). Some flexibility should be allowed in the design of the mission so that comments from IFDC or elsewhere can be incorporated.

5. Soils information, particularly mapping data, for the Highlands and Sudano-Sahelian agroecological zones should be assembled. The NSC library at Nkolbisson should be able to provide much of what exists, but other data may also be available elsewhere. Data collected for the unpublished soils map of the Nkambe quadrangle (most of the North-West Province) should be accessed and copies made of the data. The possibility of financing the publication of the data through the Monitoring Fund should also be explored.

6. Raw Data collected during the 1967-73 FAO "Programme Engrais" should be assembled and copied so as to be ready for the mission. This should be done for at least the two agroecological zones and crops to be covered. If there is sufficient time, this can be done for the entire amount of data collected. The FAO data may be found at the Direction d'Agriculture with Mme. Djoh. Data assembled should include: raw data sheets for each site and year, summary sheets for each area, soils data (not yet located), economic data (not yet located), and the instruction forms for implementing the trials and demonstrations issued annually and by crop (experimental design, materials, and methods).

7. A committee should be formed to review minimum and site-specific data sets. This committee will recommend to the preliminary mission the use of these data sets based on their collective knowledge of the raw data to be collected. Final decisions on these data sets will be made during the mission itself. Recommended personnel to contact for the data sets committee are: Dr. Ayuk-Takem (IRA Director), Dr. Bindzi-Tsala (NCS Director), Dr. René Kaiser (IRA Research Director), Dr. Kotto-Same (CNS Research Advisor), Dr. Poku (NCRE/TLU Agronomist), and the Technical Coordinator of the TSU.

8. A communication should be made to all IRA research facilities and development institutions in the two agroecological zones informing them of the mission and what types of data will be required (data sets), the timing of the mission, the objectives of the NFRD and the role of the preliminary mission in achieving these objectives. Annexes G1, G2, and G3 list possible sources of data. Other possible sources of data or information leading to data should also be consulted (e.g. FSSRP/Abt Assoc. October, 1989 Appendix D). A pre-mission contact tour should be made to each of these two zones by the technical coordinator of the TSU prior to the mission to verify that raw data is or will be in a central location and ready to be reviewed by the preliminary mission team. Contact person(s) in each of the two zone should

be identified to serve as liaison between the team and the sites where data may be found.

9. Arrange for use of IRA Unité Informatique facilities for the time period of the mission (See Mr. Partiot). Identify one or two individuals to participate in the training components of database management. It is recommended that Martin Tchienkoua of the NSC be one such participant.

10. The USAID representative for the preliminary mission, should arrive in-country two weeks prior to the start of the mission (by September 3rd). The consultant will work with the TSU and USAID to finalize the pre-mission arrangements, including confirmation that the preparatory steps have been taken, including travel arrangements for the preliminary mission team. The consultant will also accompany the technical coordinator of the TSU on the pre-mission contact tour to the sites for verification of the existence of data.

Preliminary Mission (September 17-October 12, 1990)

The following is a suggested timetable for four phases of the preliminary mission to address the scheme of work presented earlier. This should not be considered as a fixed schedule of events, but rather viewed as flexible so that comments from IFDC or other involved persons and agencies may be incorporated. The schedule will also be a function of the progress made towards fulfillment of the "Preparatory Steps" listed above.

Phase I: September 17-19 (three working days)

Initial meeting of all team participants for briefing on scope of work and schedule. Discussion of known data sources, planning for data collection exercise. Review of locally available data and samples (FAO data and other). Infrastructural arrangement will be verified (access to required hardware and software). Discussion of data sets by committee. Divide participants into two teams for Highlands and Sudano-Sahelian zones.

Phase II: September 20-September 29 (nine working days)

Nine days data collection in each agroecological zone. In addition to on-farm and on-station trial data, attention must be given to agroclimatic data (soils, cropping system, climatic data). The itinerary of the data collection tour will depend on the contact people and sites identified in each zone.

Phase III: October 1-9 (eight working days)

Organization of data entry, and training of participants in methods to be used in determining fertilizer recommendations from collected data. Determination of database specifications, and

creation of a database of capacity to manage projected amounts of data. Design of methodologies for collection and incorporation of non site-specific data. Fertilizer recommendations for targeted crops.

Phase IV: October 10-12 (three working days)

Determination of longer-term training needs for database creation and management. Arrangements made regarding backstopping needs. Estimation of budgetary requirements for ongoing data collection and entry, database maintenance and management, and backstopping. Presentation of results and progress achieved to the FSSRP. Report writing.

Follow-up after the Preliminary Mission

1. Infrastructural and institutional arrangements made with the biometry and computer section of IRA and the NSC for long-term maintenance of the NFRD. The nature of the coordination and collaboration must be defined.

2. Continued collection of raw data for other crops and zones. Incorporation of collected data and additional non site-specific data into database.

3. Backstopping support from Julio Henao for punctual problem solving.

4. Debugging of information: information gaps or anomalies in the database (e.g. outlier or missing data) identified and either deleted or completed based on available information.

5. Adjustments/modifications of database in response to user suggestions.

6. Organization of seminar with primary objective to demonstrate to potential users the utility of the database and how to access information through the NFRD.

7. Conduct on-farm fertilizer response trials and demonstrations (e.g. through MIDENO, UCD, or other agencies) to fill information gaps, confirm/test recommendations, and add information to the NFRD.

Other Options

The recommended option described above is a way of addressing the issues that arise when a National Fertilizer Response Database is considered for Cameroon. It is not, however, the only available option. The recommended option is not all inclusive and could forseeably incorporate components of other options that will be discussed in this section.

IFDC-Africa has strongly noted the need for a biometrician/database specialist in their office in Lomé. It would be extremely useful to fertilizer information users in the whole region if IFDC-Africa were to get support for this addition to their personnel. The Special Programs for African Agricultural Research (SPAAR) should be contacted for possible medium term support. Lance Jepson would be the person in Abidjan to contact about this and a proposal already formulated would be useful for discussion. The creation and eventual management of the NFRD for Cameroon provides a unique training opportunity for this person while it would further supplement (with spinoff effect) the time and effort that Julio Henao invests in the NFRD.

Database management is becoming more important as computer hardware and software become accessible and the potential uses become more evident. There are no known national fertilizer response databases in Africa at this time. Conditions should be good for incorporating the research and training needs of one to several doctoral candidates in the creation of Cameroon's NFRD. If actual research costs for graduate students were considered for support by the FSSRP, these would probably not be significant additions to other costs involved in the recommended option. The research done by graduate students could be incorporated into the overall scheme of creating and managing the NFRD. Such an approach may provide a lower cost technical input and ensure a greater degree of continuity.

Capability of international institutions for national fertilizer response database management has not been explored at this point. ORSTOM and CIRAD may have developed an institutional capability of this type that could be used in the creation of the NFRD. The International Benchmark Soils Network for Agrotechnology Transfer (IBSNAT) may have some experience in database management needed for the NFRD. ICRISAT probably has a capability in database management although it may not be for fertilizer response databases. If ICRISAT was interested in working in the Sudano-Sahelian zone in Cameroon (the only agroecological zone in Cameroon which fits into their mandate) on creation of the NFRD, it may be possible to train Cameroonian scientists to continue the work in the rest of the country. TROPSOILS, based at Texas A&M, may also have this kind of capability. Even if the FSSRP decides to implement the recommended option described above, these international oriented institutions should be contacted for advice etc. before the implementation stage. The objective of this contact would be to get a firm handle on what is available out there in terms of information thus more clearly defining what should be done with limited resources in the creation of the NFRD in Cameroon.

ANNEX A2

SITE-SPECIFIC DATA SET (DRAFT) FOR THE NFRD

The site-specific data set gives an idea of the data to be gathered, if available, at the site where raw fertilizer response data is located. Site specific data does not indicate, as the name may imply, geographical, topographical, climatic and soils data relevant to the site. This latter is usually not recorded along with trial results because much of it is assumed and thus not repeated for each trial. This annex intends to outline the type of data that may be included in the raw data of a trial and which the preliminary mission should consider when members make the final decision on what should be included in the data set. Geographical, topographical, climatic and soils information will have to be recorded for each trial but will not be a part of this site-specific data set. These additional data, plus the site-specific data set, comprise the "minimum data set" to be used for the NFRD. Economic information (e.g. input, output commodity prices) and farming systems data (e.g. management factors) will also become important for users of the NFRD but will be not included in the site-specific data set because they can be collected independently of the trial data set. These are the "non site-specific" data. One of the tasks of the agricultural economists and agronomists on the preliminary mission will be to decide which non site-specific economic and farming systems information will be gathered and to develop methodologies for obtaining it.

Outline of Site-Specific Data Set

A. Administrative factors

1. Who conducted the trial or demonstration. What institution and which individual(s) within the institution?
2. Was there collaboration with other institutions? If so, which ones?
3. Year and cropping season experiment was conducted.
4. Province, Department, Town (Village) and Research Station or Farm where experiment was conducted.

B. Crops (and intercrops) and varieties used

1. Crop(s) for which yield data was recorded.
2. Varieties (cultivars) or populations of above crop(s).
3. Were there other crops (in association) for which no yield data was recorded in same plot? If so, identify these crop species and varieties.

C. Research or extension objectives

1. Who was the research client?
2. What was (were) the research objective(s)?
3. What research hypotheses were tested in trial?
4. What assumptions were made?

D. Methodology and design factors

1. Trial or demonstration was conducted on-station, on-farm or other.
2. Trial or demonstration was researcher, extension agent or farmer managed?
3. General and specific design used (ie. RCB in 2^3 factorial layout).
4. Indicate which variables were random, fixed, independent or nested.
5. Treatment identification, number of levels and specification (where applicable) of main plots, subplots or sub-sub plots etc.
6. Number and identification of locations where trial was conducted. This must be clear especially when data was combined over more than one location and should be indicated in A.4, above.
7. Replication number at each location.
8. Were blocks used? Identification of blocks. Were replications considered as blocks (at the same location)? Were locations considered as blocks?
9. Surface area (m^2) of the smallest plot for which yield data is recorded. Surface area by treatment, replicate, block and location and indicate if this is what was used in recording data.
10. How was randomization accomplished? What treatments were randomized? Which weren't randomized?

E. Management factors

1. Seedbed preparation, how was it accomplished and date(s)?
2. Sowing, transplant or cutting installation date(s) of crops listed in B.1-3, above. Specify which was used.
3. Plant spacing and plant density at sowing, germination and harvest for crop species listed in B.1 and B.3, above.
4. Weeding methods and dates.
5. Nematicides, insecticides or herbicides - application methods and dates, and doses used.
6. Harvest method(s) and date(s).
7. Damage assessment. Disease, insect, parasitic weeds, animals (wild or livestock) or lodging - identification, timing, methods used to estimate damage and % damage.

F. Yield

1. Units used to report plot yield for each crop.
2. Plant part(s), maturity stage and moisture content ie. dried grain at 10% moisture or fresh green cob weight.
3. Raw data (nonconverted, nontransformed and nonadjusted) from each plot or subplot and for each crop.
4. Conversion, transformation or adjustment factors or formulae.
5. Were observations recorded in E.7, above, used to alter yield data in any way? If so, how?

G. Plant tissue analyses on crop(s) in experiment*

H. Soil laboratory analyses of plot soil samples taken either before sowing, during or right after cropping season*

* All soil and plant tissue laboratory results should be reported in a uniform and systematic manner.

ANNEX A3

LIST OF STRUCTURES OF THE INSTITUT DE RECHERCHE AGRONOMIQUE

The structure of the Institute de Recherche Agronomique (IRA) consists of a headquarters, six "Research Centres," 16 research "Stations," and 29 research "Antennas." The headquarters are situated in Nkolbisson, which also serves as the location for three of the Research Centres. The following is a list of IRA structures and accompanying information on personnel, addresses, and telephone/telex numbers. A map is included showing the location of the structures. More information may be available through the IRA structures themselves. A map showing the location of the structures is also included.

Nkolbisson (Direction de Recherche Agronomique)

Directeur:	Dr. Ayuk-Takem Jacob
Directeur Adjoint:	Dr. Bakala Joseph
Address:	B.P. 2123 Yaoundé
Telephone:	23.26.44/23.31.05
Telex:	1140KN, 1141KN, 1142KN, 8512KN

Maroua (Centre de Recherche Agronomique)
Chef du Centre: 29.13.26
Bureau de Domayo: 29.11.78
Bureau Djarengol: 29.11.64

Maroua (station)
Chef de Station: Dr. Boli
Address: B.P. 33 Maroua

Antennas: Garoua (B.P. 415), Ngaoundéré, Kousseri, Guetale, Maga, Yagoua, Tchatibali, Makebi, Soucounou, Sanguere, Fignol, Tchollire, Ndock, Touboro.
Chef des Antennes: 29.12.05

Njombe (Centre de Recherche Agronomique)
Chef du Centre: M. Michel Foyet
Address: B.P. 13 Njombe

Njombe (station)
Address: B.P. 13

Antenna: Mbouroukou.

Dschang (station)
Chef de Station: Dr. Nzietchueng
Address: B.P. 44
Telephone: 45.13.02

Antenna: Santchou.

Bambui (station)
Chef de Station: M. Ngong-Nassah E. (M. Nankam Claude?)
Address: B.P. 80 Bamenda

Antennas: Babungo, Bamenda, Santa, Mbouda (B.P 15 Bamenda; 48.51.93).

Ekona (Centre de Recherche Agronomique)
Chef du Centre: Dr. Simon Lyonga (à Dschang)
Chef du Centre: Dr. Nanagah Chebesi (interim)
Address: B.P. 25 Buea

Ekona (station)
Address: B.P. 25 Buea

Antennas: Niété, Edea, Kribi (B.P. 178; 46.11.15), Kumba (M. Songwe Nicholas; 35.41.44)

La Dibamba (station)
Chef de Station: M. Kalga Kondjo

Antenna: Mondoni

Nkolbisson (Centre de Recherche Agronomique)
Chef du Centre: Dr. Ayuk-Takem Jacob
Address: B.P. 2026 Yaoundé
Telephone: 23.26.44

Nkolbisson (station)
Address: B.P. 2026 Yaoundé
Telephone: 23.26.44

Antennas: Mbalmayo, Bertoua (B.P. 203 Bertoua; 24.16.28), Abong-Mbang, Belabo

Foumbot (station)
Address: B.P. 665 Foumbot
Telephone: 44.14.76

Antennas: Foumban (48.21.18), Bangangte (48.42.54)

Barombi-Kang (station)
Address: B.P. 62 Kumba

Antennas: Eyumojock, Kumba.

Nkoemvone (station)
Chef de Station: M. Kadje Alexis (?)

Nkolbisson (Centre de Recherche Forestière)
Chef du Centre: Dr. Nsangou
Telephone: 23.35.82

Stations: Nkolbisson, Douala, Kumba, Herbier National (B.P. 1601 Yaoundé, 22.44.16).

Nkolbisson (Centre National des Sols)
Directeur: Dr. Bindzi-Tsala Joseph
Directeur Adjoint: Dr. N.G. Kuoh Moukouri
Address: B.P. 5578 Yaoundé
Telephone: 22.33.62

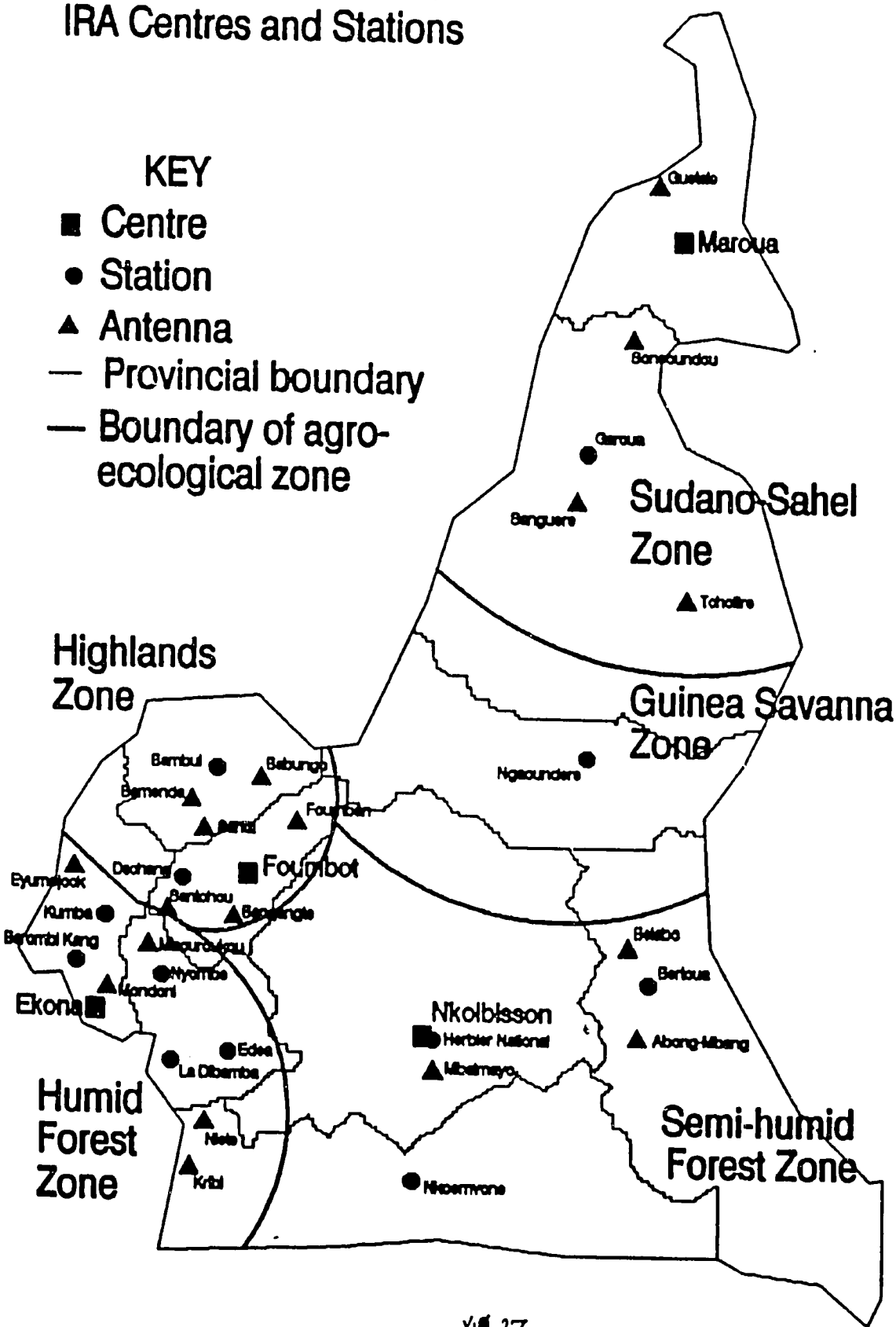
Nkolbisson (station)
Chef de Station: Dr. Bindzi-Tsala
Address: B.P. 5578 Yaoundé

Ekona (station)
Chef de Station: M. Moukam Appolinaire
Address: B.P. 51 Buea

Dschang (antenna)
Chef d'Antenne: Dr. Awah
Telephone: 45.12.82

Maroua (antenna)
Chef d'Antenne: Dr. Seiny Boukar L.

Figure : Map of Cameroon Showing Agro-Ecological Zones, and IRA Centres and Stations



ANNEX A4

RESEARCH, EXTENSION, AND DEVELOPMENT INSTITUTIONS/PROJECTS IN CAMEROON THAT MAY HAVE FERTILIZER RESPONSE DATA OR OTHER RELEVANT INFORMATION FOR THE NFRD

Name of the Institution/Project	Activities	Legal Status	Super-Vision	Years	Address, Telephone and Telex	Agro-Ecol. Zone*
Centre Universitaire de Dschang (CUDS)	Agricultural Ed., Research, and Extension	Parastatal	MESIRES	1977-pres.	B.P. 96/110 Dschang 45.12.67/45.11.34 7013 KN	1,3,5
Mission de Développement de la Province du Nord-Ouest (MIDENO)	Development, Research, and Extension	Parastatal	MINAGRI	1981-pres.	B.P. 442 Bamenda 36.13.78/36.13.79 5842 KN	3
Societé de Développement de la Haut Vallée du Noun	Agric. Devel. of Upper Noun Valley	Development Society	MINAGRI	1970-pres.	Ndop and Mezam	3
Mission d'Etude pour l'Amenagement du Littoral (MEAL)	Development of Littoral Prov.	Parastatal	MINPAT	1972-pres.	B.P. 6102 Yaoundé B.P. 5400 Douala 23.23.13/42.52.38	4
Mission d'Etudes pour l'Amenagement de la Vallée Superieur de la Benoué (MEAVSB)	Development of Greater Benoue Valley	Parastatal	MINPAT	1972-pres.	B.P. 11 Garoua 27.14.35 7672 KN	1
Mission de Développement d'Ombessa (MIDO)	Agric. Devel. and Extension	Parastatal	MINPAT	1973-pres.	B.P. 33 Ombessa 28.53.18/23.53.07	5
Mission de Développment Integré des Monts Mandara (MIDIMA)	Development of Mandara Mountainn area	Parastatal	MINPAT	1982-pres.	Mokolo	1
Societé de Développment du Nkam (SODENKAM)	Devel. of Yabassi-Bafang area	Development Society	MINPAT	1970-pres.	B.P. 2 Nkondjock	4
Societé Regionale de Développement des Zones d'Actions Prioritaires Integrées de l'Est (ZAPI-EST)	Development of East Province	Development Society	MINPAT	1972-pres.	B.P. 132 Bertoua 24.13.35 8522 KN	5
Wum Area Development Authority (WADA)	Development of Wum area	Parastatal	MINAGRI	1973-pres.	B.P. 12 Wum 37.30.26	3
Projet de Développement Rural de la Province de l'Ouest (PDRPO)	Development and Extension	Development Society w/in Cooperative	MINAGRI	?-present	B.P. 1002 Bafoussam 44.18.45/44.14.39 7005 KN/7051 KN	3
Fonds National de Developpent Rural (FONADER)	Agricultural and Rural Development	Parastatal	MINAGRI	1973-1989	B.P. 1548 Yaoundé 23.10.25/22.09.45 8365 KN	1,2,3 4,5
Mission de Développement des Semences et des Cultures Vivrieres, Marachieres, et Fruit. (MIDEVIV)	Seed production, Distribution, Agric. Devel.	Parastatal	MINAGRI	1973-pres.	B.P. 1682 Yaoundé 23.06.68/23.38.09	1,2,3 4,5

Name of the Institution/Project	Activities	Legal Status	Super-Vision	Years	Telephone and Telex	Ecol. Zone*
Societé de Developpement de la Riziculture dans la Plaine de Mbo (SODERIM)	Agric. Devel. (rice)	Development Society	MINAGRI	1977-pres.	B.P. 12 Santchou 49.15.58 5344 KN	3
Societé d'Expansion et Modernisation de la Riziculture de Yagoua (SEMRY)	Agric. Devel. (rice)	Development Society	MINAGRI	1971-pres.	B.P. 46 Yagoua 29.62.13 7566 KN	1
Cameroon Development Corporation (CDC)	Exploitation of large plantations	Perastatal	MINDIC MINAGRI	1946-pres.	B.P. 23 Limbe 33.22.51/5242 KN	4
Societé Camerounaise de Palmeraies (SOCAPALM)	Oil Palm Devel., Processing	Development Society	MINDIC	1968-pres.	B.P. 691 Tiko 42.31.28/42.81.38 5576 KN	4
Plantations Pamol du Cameroun, Ltd.	Oil palm and Rubber plantations	Private	MINDIC	1967-pres.	B.P. 55 Limbe	4
Societé de Palmeraies de la Ferme Suisse (SPFS)	Oil Palm plantation	Private	MINDIC	1976-pres.	B.P. 6 Edea-Ongue 23 Rue de l'Admiral d'Estaing 75116 Paris 30.06.84	4
Societé Camerounaise d'Hevea (HEVECAM)	Promotion of Rubber	Development Society	MINAGRI	1975-pres.	B.P. 174 Kribi B.P. 1298 Douala 42.75.64/5880 KN	4
Societé Africaine Forestiere et Agricole du Cameroun (SAFACAM)	Forestry, Rubber and Oil palm plantations	Private	MINDIC	1962-pres.	B.P. 100 Dizngue 42.75.12	4
Organisation Camerounaise de la Banane (OCB)	Banana Marketing Advertising	Parastatal	MINDIC	1968-pres.	B.P. 221 Douala 42.31.21/42.30.93 5694 KN	4
Societé des Nouvelles Plantations de Nyombe-Penja (SNPNP)	Banana plantations	Private	MINDIC	1919-pres.	B.P. 3 Nyombe	4
Mukete Plantations	Cacao, rubber, oil palm, and coffee plantations	Private	MINDIC	???	B.P. 1 Kumba 35.45.35 5242 KN	4
Societé de Développement du Blé (SODEBLE)	Wheat marketing and production	Development Society	MINAGRI	1975-pres.	B.P. 41 Ngaoundere 25.11.56/7642 KN	1,2
Societé de Developpement du Coton (SODECOTON)	Production, Proc., Marketing of Cotton	Development Society	MINDIC	1974-pres.	B.P. 302 Garoua Immeuble SNI Y'dé 27.10.30/7617 KN	1,2
Societé Camerounaise de Coton et de Compresses Bandes (CAOCAM)	Processing hydro-philic Cotton	Private	MINDIC FOGAPE	???	B.P. 343 Yaoundé	1,2
Cameroon Sugar Company (CAMSUCO)	Prod., Proc. of Cane Sugar	Private	MINDIC	1975-pres.	B.P. 1462 Mbandjock 23.39.26/8309 KN	5

Name of the Institution/Project	Activities	Legal Status	Super-Vision	Years	Telephone and Telex	Ecol. Zone*
Societé Sucrerie du Cameroun (SOSUCAM)	Prod., Proc. of Cane Sugar	Private	MINDIC	1967-pres.	B.P. 857 Nanga Eboko 22.39.26/8323 KN	5
?? Ananas Camerounaise? (ANACAM)	Pineapple	Private?	MINDIC	???	???	4,5
Societé Camerounaise des Tabacs (SCT)	Prod., Proc. of Tobacco	Private	MINDIC	1964-pres.	B.P. 29 Y'dé/8567 KN 22.14.88/22.50.60	3,5
Societé Agricole et de Collecte de Tabacs (SACTA)	Prod., Proc. of Tobacco	Private	MINDIC	1958-pres.	B.P. 1032 Y'dé 22.04.00/22.16.64 8212 KN	3,5
Societé de Développement du Cacao	Tech. Assist. in Cacao production	Parastatal	MINAGRI	1974-pres.	B.P. 1651 Yaoundé 22.45.44/22.09.91	4,5
Union Centrale des Coop-eratives Agricoles de l'Ouest (UCCAO)	Coordination of Cooperatives	Cooperative Union	MINAGRI	1958-pres.	B.P. 1002 Bafoussam 44.14.39/44.18.45 7005 KN/7051 KN	3
Societé Agricole de Foumbot (SAF)	Agric. Production, Extension	Private	MINAGRI	1950-pres.	B.P. 9 Foumbot	3
Societé Africaine de Fruits et Legume (SAFEL)	Fruit, Vegetable prod., marketing	Private	MINDIC	1976-pres.	B.P. 1184 D'la/5225 KN B.P. 688 Bafoussam 42.15.02/44.15.66	3,4
Office Natoinal de Regeneration de Forets (ONAREF)	Reforestation	Parastatal	MINAGRI	1982-pres.	B.P. 1341 Yaoundé 22.42.81/22.40.88	1,2,3 4,5
Centre National de Développement des Forets (CENADEFOR)	Forestry Devel., Extension	Parastatal	Sec'y State for AGRIC	1981-pres.	B.P. 360 Yaoundé 22.51.93 8561 KN	1,2,3 4,5

* See ANNEX for agroecological zones in Cameroon: 1=Sudano-Sahelian; 2=Guinea Savanna; 3=Highlands; 4=Humid Forest; 5=Semi-Humid Forest.

ANNEX A5

INTERNATIONAL AGRICULTURAL DEVELOPMENT INSTITUTIONS/PROJECTS IN CAMEROON THAT MAY HAVE FERTILIZER RESPONSE DATA OR OTHER RELEVANT INFORMATION FOR THE NFRD

Acronym	Nom	Interets de Recherche	Province d'Intervention	Zones Agro-Ecologique*
ADRAO	Amelioration et Dével-oppement du Riz en Afrique de l-Ouest	Recherche systeme et l'amelioration du riz	Extreme Nord, Nord, Adamaoua, Nord-Ouest	1,2,3
Banque Mondiale	Banque Mondiale	Développement et vulgarisation		4,5
CARE/Cameroun	CARE/Cameroun	Forestrie et agroforestrie		
CIAT	Centre International d'Agriculture Tropicale	Amelioration des haricots, recherche systemes		
CIMMYT	Centre International de Mejorimento de Maize y Trigo	Amelioration du Mais et blé, recherche systemes		
CIP	Centro International Papas	Amelioration des pomme de terre	Ouest, Nord-Ouest, Sud-Ouest	3
CIRAD/IRAT	l'Institut de Recherche Agronomique Tropicale	Cultures vivrieres tropicales	Extreme Nord, Nord, Ouest, Nord-Ouest, Centre	1,2,3,5
CIRAD/IRCT	l'Institut de Recherche du Coton et Textiles Exotique	Cultures et industries de textiles	Extreme Nord, Nord, Adamaoua	
CIRAD/IRHO	l'Institut de Recherche pour les huiles et oleagineuse	Principalement palmier a huile	Sud-Ouest, Littoral	4
CIRAD/CTFT	Centre Technique Forestiere Tropicale	Especes, tehcniques, et gestion forestier		1,2,3,4,5
CRDI	Centre de Recherche pour le Développement International	Recherche systemes, tubercules, et cultures racines	Sud-Ouest, Sud, Littoral, Centre, Est	4,5
CRSP	Collaborative Research Support Program	Amelioration niebe	Extreme Nord, Nord	1
FAO	Organisation Nations Unies pour l'Alimentation et Agriculture	Pedologie et reponse des cultures aux engrais	Extreme Nord, Nord, Nord-Ouest, Ouest, Sud-Ouest, Littoral, Sud, Centre	1,3,4,5
FAVP		Reforestion	Extreme Nord	1
Gatsby	Gatsby Foundation of the United Kingdom	Tubercules	Sud-Ouest, Sud, Littoral, Sud, Ouest, Adamaoua	2,3,4,5
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit	Mechanisation, devel-oppement, et ferms d'experimentation	Nation (FONADER), Nord, Nord-Ouest	1,3

Acronym	Nom	Interets de Recherche	Province d'Intervention	Zones Agro-Ecologique*
IBSRAM	International Board for Soil Research and Management	Pedologie et sols	Centre	5
ICRAF	International Centre for Research and Agroforestry	Agroforestire recherche et gestion		
IFAC	l'Institut Français des Agrumes Coloniaux	Cultures et industries fruitieres	Sud-Ouest, Sud, Littoral	4
IFCC	l'Institut Français sur Café et Cacao	Plantes stimulantes café, cacac, thé	Ouest, Nord-Ouest, Sud	3,5
IFDC	International Fertilizer Development Center	Engrais et reponse aux engrais	National	1,2,3,4,5
IITA/NCRE	International Institute of Tropical Agriculture/ National Cereals Research and Extension Project	Recherche systemes et cultures vivrieres (Cerealieres)	Extreme Nord, Nord Nord-Ouest, Ouest, Sud-Ouest, Centre	1,4,5
IMPHOS	Institut Mondial de Phosphore	Gisement de phosphate		
INTSORMIL	International Sorghum and Millet Program	Amelioration du Sorgho et mil et systemes culturales		
INTSOY	International Soybean Program	Amelioration de la Soja et systemes culturales		
IRRI	International Rice Research Institute	Germplasm du riz et systemes culturales	Extreme Nord, Nord, Adamaoua	1,2
Israel		Agroforestire	Extreme Nord	1
ORSTOM	Institut Français de Recherche Scientifique pour le Développement en Cooperation	Pedologie et autres etudes	National	1,2,3,4,5
ROTRED	Roots and Tuber Research and Extension Project	Cultures de racines et tubercules	Sud-Ouest	4
SAFGRAD	Semi-Arid Food Grain Research and Development	Niebe, cereales, et prevulgarisation	Extreme Nord, Nord	1
TSBF	Tropical Soil Biology and Fertility	Matiere organiique et son evolution dans le sol	Centre	5
TROPSOILS	Tropical Soils Collaborative Research Support Program			

* See ANNEX for agroecological zones in Cameroon: 1=Sudano-Sahelian; 2=Guinea Savanna; 3=Highlands; 4=Humid Forest; 5=Semi-Humid Forest.

ANNEX B

FERTILIZER SUB-SECTOR REFORM PROGRAM

1990 FERTILIZER USE SURVEY

Survey Information:

Background Information. In 1987, the government of the Republic of Cameroon signed an agreement with the United States Agency for International Development (USAID) creating the Fertilizer Sub-Sector Reform Program (FSSRP). The goals of the FSSRP are as follows:

1) Improve importation and distribution of fertilizer;

2) Increase the responsiveness of fertilizer supply to demand;

3) Improve the effectiveness of on-farm fertilizer use; and

4) Create an adaptable and sustainable fertilizer sub-sector.

Survey Objectives. The purpose of the Fertilizer Use Survey is to provide information on fertilizer use at the farm-level. This will be done by gathering information from individual households throughout the province using a questionnaire. Information collected through the survey will be tabulated on a province-wide basis. Interpretation of this (and other) information will help guide planners in meeting FSSRP goals.

Confidentiality. Farming households are selected for interview at random, based on the sampling units defined by the National Directorate of the Agricultural Census within the Ministry of Agriculture. Information collected on individual survey questionnaires will be held on a strictly confidential basis, and will not be used for other than the above-stated survey objectives.

QUESTIONNAIRE

No:_____

Enumerator:_____ Date:_____

Farmer(s) name:_____ Sex: M___ F___

Location:_____

Household Characteristics

1) How many people live in your household? _____ people

2) How much area does your farm cover? _____ hectares

3) How much of that area is currently cultivated? _____ %

What crops did you harvest last year?
Was it for home consumption, for sale, or for both?

	Do not produce	Do produce for: Home cons.	Sale	Both
4) Coffee	0		2	
5) Cacao	0		2	
6) Maize	0	1	2	3
7) Beans	0	1	2	3
8) Yams/Cocoyams/Taro	0	1	2	3
9) Irish Potatoes	0	1	2	3
10) Plantain/Bananas	0	1	2	3
11) Cassava	0	1	2	3
12) Oil Palm	0	1	2	3
13) Sugar Cane	0	1	2	3
Others (specify):				
14) _____	0	1	2	3
15) _____	0	1	2	3
16) _____	0	1	2	3

Do you keep any of the following animals?

17) Cattle	0-No	1-Yes
18) Goats/Sheep	0-No	1-Yes
19) Pigs	0-No	1-Yes
20) Fowl	0-No	1-Yes

Does your household work in any of the following professions?

21) Trading (buying and reselling)	0-No	1-Yes
22) Artisanry (tailoring, repair, etc.)	0-No	1-Yes
23) Agricultural wage-labor	0-No	1-Yes
24) Other wage-labor	0-No	1-Yes
25) Other (specify)_____		

Do you own any of the following items?

26) Radio	0-No	1-Yes
27) Bicycle	0-No	1-Yes
28) Motorcycle	0-No	1-Yes

How many years of schooling do you have?

29) Husband ____ years
30) Wife ____ years

31) Are you a member of a coffee cooperative? 0-No 1-Yes

Coffee Production

32) Did you harvest coffee last year? 0-No 1-Yes
(if No, skip to Maize Production; if Yes, continue)

33) What kind of coffee trees do you have?
1-Arabica
2-Robusta
3-Both

34) How many trees do you have? _____ trees

35) What is the distance between trees? _____ meters

36) What is the distance between rows? _____ meters

37) Did you intercrop other crops with the coffee? 0-No 1-Yes
(if No, skip next question)

Which crops did you intercrop with the coffee? (check those that apply)

38)	Maize	0-No	1-Yes
39)	Beans	0-No	1-Yes
40)	Plantains/Bananas	0-No	1-Yes
41)	Irish Potatoes	0-No	1-Yes
42)	Yams/Cocoyams/Taro	0-No	1-Yes

43) Other (specify) _____
44) Other _____

45) How many sacks did you harvest last year? _____ sacks

46) Who did you sell the coffee to/
1-Cooperative
2-Coffee Processor
3-Merchant
4-Other (specify) _____

47) What month did you deliver the coffee harvest? _____

48) When did you receive the first payment for the coffee?
1-Immediately
2-Within one week of delivery
3-Between one and four weeks
4-Between one and three months
5-Longer than three months
6-Not yet

49) When did you receive the final payment for your coffee?
1-Within one week of delivery
2-Between one and four weeks
3-Between one and three months
4-Longer than three months
5-Not yet

Maize Production

50) Did you produce maize last year? 0-No 1-Yes
(if No, skip to Fertilizer Use; if Yes, continue)

51) What kind of maize seed did you use?
1-Improved
2-Traditional
3-Both

52) Where did you obtain the maize seed?
1-Cooperative
2-Credit Program
3-Ministry of Agriculture
4-Merchant
5-Another farmer
6-Saved from own harvest

53) Did you intercrop other crops with the maize? 0-No 1-Yes
(if No, skip next question)

Which crops did you intercrop with the maize? (check those that apply)

54) Beans	0-No	1-Yes
55) Irish Potatoes	0-No	1-Yes
56) Yams/Cocoyams/Taro	0-No	1-Yes
57) Cassava	0-No	1-Yes
58) Groundnuts	0-No	1-Yes
59) Other (specify) _____		
60) Other _____		

61) How much maize did you harvest? _____ _____
quantity unit

62) Did you sell any of the maize? 0-No 1-Yes
(if No, skip to question #66; if Yes, continue)

63) What proportion of the harvest was sold?
1-Only a little
2-About half
3-Over half

64) How was the maize sold?
1-Through a cooperative
2-At a market place
3-To a merchant
4-To another farmer
5-Other (specify) _____

65) What price did you receive for the maize sold? _____ _____
value unit

66) Did you buy maize this year? 0-No 1-Yes
(if No, skip to Fertilizer Use; if Yes, continue)

67) Did you buy more maize than you sold? 0-No 1-Yes

68) What price did you pay for the maize bought? _____ _____
price unit

Chemical Fertilizer Use

69) Have you used chemical fertilizers in the past five years?
0-No 1-Yes
(if No, skip to Non-User of Fertilizer; if Yes, continue)

70) How often do you use fertilizer?
1-Every Year
2-About every two years
3-Rarely

71) How far do you have to go to buy fertilizer? _____ kilometers

72) Did you use fertilizer last year? 0-No 1-Yes
(if No, skip to Recent Fertilizer User; if Yes, continue)

Current Fertilizer User

73) What is the best type of fertilizer for your farm?
1-Ammonium sulfate
2-Urea
3-NPK 20-10-10
4-NPK 12-06-20
5-NPK 10-30-10
6-Other (specify) _____
7-No preference

74) What is the second best type of fertilizer for your farm?
1-Ammonium sulfate
2-Urea
3-NPK 20-10-10
4-NPK 12-06-20
5-NPK 10-30-10
6-Other (specify) _____
7-No preference

For each type of fertilizer, answer the following questions:

	Ammonium sulfate	Urea	20-10-10	12-06-20	10-30-10	_____
How many bags did you use?	75	76	77	78	79	80
What was the price per bag?	81	82	83	84	85	86
What month did you buy it?	87	88	89	90	91	92
What month did you apply it?	93	94	95	96	97	98

On which crop(s) did you use fertilizer? (mark with an "X")

	Ammonium sulfate	Urea	20-10-10	12-06-20	10-30-10	_____
Arabica	99	100	101	102	103	104
Robusta	105	106	107	108	109	110
Maize	111	112	113	114	115	116
Irish Potatoes	117	118	119	120	121	122
Other_____	123	124	125	126	127	128
Other_____	129	130	131	132	133	134

How did you put fertilizer on the fields? (check those that apply)

135)	Scattered	0-No	1-Yes
136)	Along line	0-No	1-Yes
137)	Around each plant	0-No	1-Yes
138)	Between plants	0-No	1-Yes

139) Was the fertilizer mixed into the soil? 0-No 1-Yes

140) Where did you buy your fertilizer?
1-Through a cooperative
2-From a merchant
3-From a project
4-From another farmer
5-Other (specify)_____
6-More than one source

141) How did you buy the fertilizer?
1-In cash
2-On credit
3-Part cash, part credit

142) Were you allowed to buy as much fertilizer as you wanted at the going price? 0-No 1-Yes
(If Yes, skip next question)

143) If not, why not?
1-Limitation on the quantity of fertilizer available
2-Limitation based on amount of coffee sold
3-Limitation of the amount of credit available

144) Was the fertilizer available on time? 0-No 1-Yes
(if Yes, skip next question)

145) If not, what month would you like it available? _____

146) Were the types of fertilizers you wanted to buy available? 0-No 1-Yes
(if Yes, skip next question)

147) If not, what types of fertilizer did you want but were not available?
1-Ammonium sulfate
2-Urea
3-NPK 20-10-10
4-NPK 10-30-10
5-Other (specify)_____
6-Other (specify)_____

148) Was the quality of the fertilizer good? 0-No 1-Yes
(if Yes, skip next question)

149) If not, what was the problem?
1-Bags were ripped
2-Fertilizer was clumped together
3-Other (specify)_____

Recent Fertilizer User

150) Do you use more or less fertilizer than you used before 1989?
1-More
2-Less
3-About the same
(if More, continue to next question; if Less, skip next question; if About the same, skip to question #166)

Why have you increased fertilizer use since 1989? (check those that apply)

151)	Increased personal buying power	0-No	1-Yes
152)	More credit available	0-No	1-Yes
153)	Wish to further increase yields	0-No	1-Yes
154)	Crop prices higher	0-No	1-Yes
155)	Fertilizer easier to obtain	0-No	1-Yes
156)	Fertilizer prices lower	0-No	1-Yes
157)	Other (specify)_____		

(skip to question #166)

Why have you decreased fertilizer use since 1989 (check those that apply)

158)	Decreased personal buying power	0-No	1-Yes
159)	Less credit available	0-No	1-Yes
160)	Found that it does not increase yields	0-No	1-Yes
161)	Crop prices lower	0-No	1-Yes
162)	Payment for crop not certain	0-No	1-Yes
163)	Fertilizer more difficult to obtain	0-No	1-Yes
164)	Fertilizer prices higher	0-No	1-Yes
165)	Other (specify)_____		

166) What do you think about fertilizer distribution now compared to before 1989?
1-Much better now
2-Somewhat better now
3-About the same as before
4-Somewhat worse now
5-Much worse now

In what way has fertilizer distribution gotten better? (check those that apply)

167)	You are allowed to buy more fertilizer now	0-No	1-Yes
168)	The fertilizer arrives more on time now	0-No	1-Yes
169)	More types of fertilizer are available now	0-No	1-Yes
170)	The fertilizer is less expensive now	0-No	1-Yes
171)	The quality of the fertilizer is better now	0-No	1-Yes
172)	Credit for fertilizer is more available now	0-No	1-Yes
173)	Fertilizer is now sold closer to your farm	0-No	1-Yes
174)	Other_____		
175)	It has not gotten better in any way	0-No	1-Yes

In what way has fertilizer distribution gotten worse? (check those that apply)

176)	You are not allowed to buy as much as before	0-No	1-Yes
177)	The fertilizer arrives later than it used to	0-No	1-Yes
178)	Fewer types of fertilizer are available now	0-No	1-Yes
179)	The fertilizer is more expensive now	0-No	1-Yes
180)	Credit for fertilizer is less available now	0-No	1-Yes
181)	The quality of the fertilizer is worse now	0-No	1-Yes
182)	You must now go further to buy fertilizer	0-No	1-Yes
183)	Other_____		
184)	It has not gotten worse in any way	0-No	1-Yes

Non-User of Chemical Fertilizer

How do you maintain adequate crop yields on your farm without chemical fertilizer? (check those that apply)

185)	You allow periods of fallow (let land rest)	0-No	1-Yes
186)	You apply manure (or compost)	0-No	1-Yes
187)	You use crop residues	0-No	1-Yes
188)	You rotate crops	0-No	1-Yes
189)	You use improved varieties	0-No	1-Yes
190)	Soils are good, no fertilizer is necessary	0-No	1-Yes
191)	Other (specify)_____	0-No	1-Yes

192) Do you believe fertilizer will increase yields on your farm? 0-No 1-Yes
(if Yes, skip next question)

193) If fertilizer does not increase yields, why not?
1-Fertilizer has little effect due to good soils
2-Fertilizer has little effect due to poor soils
3-Crops/varieties grown do not respond to fertilizer
4-Other (specify)_____
(skip to question #197)

194) Do you believe fertilizer is worth the cost and risk? 0-No 1-Yes
If Yes, skip next question)

195) If it is not worth it, why not? (check those that apply)
1-Crop prices are too low
2-Payment for crop is not certain
3-Fertilizer price is too high
4-Risk of crop failure is too high
5-Possible damage to crops
6-Possible damage to soil/land
7-Other (specify)_____
(skip to question #197)

196) If fertilizer increases yield and is worth the risk, then why do you not buy fertilizer?
1-No money
2-Can not buy on credit
3-Can buy on credit, but do not want to borrow
4-Fertilizer arrives too late to use
5-Fertilizer is not sold nearby
6-Correct type of fertilizer is not available
7-Other (specify)_____
(if answer is "lack of resources," give choice of first three)

197) Do you know where you can buy fertilizer? 0-No 1-Yes
(if No, skip to Fertilizer Knowledge)

198) If so, how far away is it? _____ kilometers

Fertilizer Knowledge

199) What is the most important source of information on the correct use of fertilizer?
1-Cooperative
2-Extension agent
3-Other farmers
4-Merchant
5-Radio
6-Own experience with fertilizer
7-Other (specify)_____
8-No sources of information are available

200) Have you been visited by an extension agent in the last 12 months? 0-No 1-Yes
(if No, skip next question)

201) If so, how many times? _____ times in 12 months

202) Which fertilizer contains the most nitrogen?
1-Ammonium sulfate
2-Urea
3-NPK 20-10-10
4-NPK 10-30-10
5-No difference
6-Do not know

203) Which fertilizer works better if it is covered by soil?
1-Ammonium sulfate
2-Urea
3-NPK 20-10-10
4-NPK 10-30-10
5-They should all be covered
6-Do not know

204) Which fertilizer can make the soil most acidic?
1-Ammonium sulfate
2-Urea
3-NPK 20-10-10
4-NPK 10-30-10
5-Do not know

205) Do you believe that land/crops can become dependent on chemical fertilizers after a few years of fertilizer use, so that if you stop using fertilizer, crop yields will go way down?
0-No 1-Yes

206) Do you use any agricultural chemicals to kill weeds, insects, or diseases? 0-No 1-Yes
(if No, skip to Pesticide/Herbicide Non-User, if Yes, continue)

Pesticide/Herbicide User

What kinds of chemicals do you use?

207)	Chemicals to kill insects and other pests	0-No	1-Yes
208)	Chemicals to kill weeds	0-No	1-Yes
209)	Do you know the name(s) of the chemicals? (if No, skip next question)	0-No	1-Yes

What are the names of the chemicals?
210) _____
211) _____

Are there any problems in getting these chemicals? (check those that apply)

212)	Not enough is available for sale	0-No	1-Yes
213)	The chemicals arrive late	0-No	1-Yes
214)	Sometimes the chemicals are not available	0-No	1-Yes
215)	Chemical you need is not now available	0-No	1-Yes
216)	There is no credit available	0-No	1-Yes
217)	The chemicals are sold too far away	0-No	1-Yes
218)	Other (specify)_____	0-No	1-Yes

END OF SURVEY

Pesticide/Herbicide Non-User

Why do you not use these products? (check those that apply)

219)	The crops you grow do not need them	0-No	1-Yes
220)	They are not worth the cost	0-No	1-Yes
221)	They arrive too late to use	0-No	1-Yes
222)	They are rarely or never available	0-No	1-Yes
223)	There is no credit available for them	0-No	1-Yes
224)	They are sold too far away	0-No	1-Yes
225)	Other (specify)_____	0-No	1-Yes

END OF SURVEY

ANNEX C

PROPOSED MODIFICATIONS OF AGRICULTURAL CENSUS QUESTIONNAIRE

Background:

Until 1987, approximately 60% of the fertilizer used in Cameroon was imported by FONADER and sold at subsidized prices to coffee growers. The price was uniform throughout the country and for all types of fertilizer imported. In 1988, the government of Cameroon with the support of USAID launched the Fertilizer Sub-Sector Reform Program (FSSRP). The objectives of this program are to privatize the distribution of fertilizer and to progressively reduce and eventually eliminate the subsidy. Given these changes in the fertilizer sub-sector, it is important to monitor more closely the distribution and use of fertilizer. With this objective in mind, the FSSRP would like to propose some minor modifications of the survey questionnaire. This includes modification of two questions and the addition of one question.

NOTE: These modifications were proposed initially by USAID consultant Nick Minot, an Information Systems Specialist, and submitted to the Director of Statistics and MINAGRI/DEAPA. Mr. Minot reported that there was a "favorable response" to the initial submission of these proposed modifications, no final decisions were reached. Given the recent changes at DEAPA in survey methodology, including the current revision of the 1990 questionnaire, the original proposal has been updated and resubmitted for consideration.

Question Modification #1:

Given the liberalization of fertilizer prices, it would be useful to know the prices paid for various fertilizers. In addition, it would be useful to change the list of the types of fertilizer to better reflect the most frequently purchased types.

Original version:
What quantities of chemical fertilizer did you use this year (indicate the type)?

	Quantity
a. Ammonium sulfate	_____ bags
b. Urea	_____ bags
c. Composite fertilizers	_____ bags
d. Others	_____ bags

Proposed version:
What quantities of chemical fertilizer did you use this year and at what price did you purchase them (indicate by type)?

	Quantity	Price
a. NPK 20-10-10	_____ bags	_____ FCFA/bag
b. NPK 12-06-20	_____ bags	_____ FCFA/bag
c. Urea	_____ bags	_____ FCFA/bag
d. Ammonium sulfate	_____ bags	_____ FCFA/bag
e. Other	_____ bags	_____ FCFA/bag

Question Modification #2:

In order to better understand demand for chemical fertilizers, it would be helpful to separate manure from chemical fertilizer use among crops fertilized. It may also be advisable break chemical fertilizer broken down into individual types (NPK 10-10, NPK 12-06-20, Urea, Ammonium sulfate, and Others).

Original version:
On which crops did you use fertilizer?

List:

_____
_____
_____
_____

Proposed version:
On which crops did you use fertilizer (indicate fertilizer type(s))?

List:	Manure	Chemical	Both
_____	0	1	2
_____	0	1	2
_____	0	1	2
_____	0	1	2

Question Addition:

With the privatization of fertilizer marketing, a diversification of the channels of distribution is expected. It would be useful to identify such channels of distribution for the rural areas.

New question:
Where did you purchase your fertilizer this year?

a. Cooperative
b. Store
c. Market
d. Other_____

ANNEX D1

RESEARCH PROTOCOL FOR FURTHER ANALYSES OF CENSUS DATABASE

Summary Information

Name of survey:	Further Analyses of Census Database
Contracting institution:	Fertilizer Sub-Sector Reform Program
Contracted institution:	Direction des Enquêtes Agro-Economique et de la Planification Agricole (DEAPA) Ministry of Agriculture
Principal Investigator:	Jim Otto
Title/position:	Technical Advisor, CAPP Project MINAGRI/DEAPA
Other Investigators:	Agoum Anabel Takou Pierre

Background

The Agricultural Census provides a large amount of data on the patterns of fertilizer use in Cameroon and its ten provinces. However, the possible analyses of the Census database concerning fertilizer use have not been exhausted--there is still valuable information to be gained through further analyses. Appropriately selected analyses may be useful in meeting some of the FSSRP's information needs regarding farm-level fertilizer use. The FSSRP will commission additional analyses of the Census database, for the years 1984-1989. These additional analyses will result in the production of three types of "supplementary tables."

Supplementary Tables

1) tables produced through disaggregation of existing provincial-level fertilizer-use tables to the divisional level,
2) two-variable tables to be produced through cross-tabulations (at the national level), and
3) tables as mentioned under 1) and 2), with data grouped according to "agroecological zones" (as opposed to administrative divisions).

A complete listing and description of the tables to be produced is included as Annex C.

Timetable (yet to be determined)

Reporting Requirements

The TSU and USAID will periodically review of the tables as they are produced. This review should be part of an ongoing dialogue between the FSSRP and DEAPA to ensure that the activity is meeting its stated objectives.

The final reporting requirement to the FSSRP will be a final document delivered to the TSU, with a copy for USAID. The document will consist of a title page, an index to the tables, and the tables themselves. All tables should be presented in a form similar to that used for the 1984 Agricultural Census publication, including title and footnotes as appropriate. Some information on sample size should be included as relates to the statistical reliability of the tables. There will be no qualitative interpretation of the table.

ANNEX D2

TABLES TO BE PRODUCED THROUGH FURTHER ANALYSES

The following is a list a list of tables suggested by the FSSRP for production through further analyses of the agricultural census database. These tables should be viewed as representing the information needs of the FSSRP as opposed to an enumeration of tasks to be performed for the activity. It may not be appropriate nor possible to produce all of the suggested tables. It may however be possible to produce useful tables other than those that have been suggested. As such, the direction and final product of this activity should be flexible, and defined over the period of implementation of the activity though dialogue between the FSSRP and DEAPA. This Annex summarizes and enumerates the initial ideas on the direction and final products of the activity.

Divisional-Level Analyses

Divisional-level data are desired to provide greater resolution of the existing information on fertilizer use. In addition, the separation of data into smaller sets will make subsequent analyses using different groupings more accessible.

The following is a list of tables to be produced by further breaking down the level at which data are summarized. Provincial totals should be given along with their representative divisional results. There are five types of tables, one each for six years ('84 through '89), and a six-year aggregate, giving a total of 35 tables.

List of Tables:

1. Total crop farms and farms using fertilizer (number and proportion) by kind of fertilizer (manure, chemical, both), season (Form 2, Form 3, and total) and division, for '84 through '89 plus six-year aggregate.
2. Farms using fertilizer (manure or chemical) by crops fertilized (cocoa, coffee, cotton, rice, tobacco, foodcrops), season (Form 2, Form 3, and total) and division, for '84 through '89 plus six-year aggregate.
3. Total crop farms and farms using chemical fertilizer (number and proportion) by type of chemical fertilizer (ammonium sulfate/urea, compound, other), season (Form 2, Form 3, and total) and division, for '84 through '89 plus six-year aggregate.
4. Farms using chemical fertilizer, total quantities of chemical fertilizer used by type (ammonium sulfate/urea, compound, other) and average quantity used per farm (using, total), season (Form 2, Form 3, and total) and division, for '84 through '89 plus six-year aggregate.
5. Farms with crops, cocoa farms, arabica farms, robusta farms, cotton farms, farms with foodcrops (and

proportions for all) and division, for '84 through '89 plus six-year aggregate.

Cross-Tabulations

Cross-tabulations are intended to provide information by illustrating relationships between two or more variables. Cross-tabulation should be possible through manipulation of the Census database. Ranges of the categories should be defined based on the distributions observed. The list below are tables to be produced through cross-tabulation. These tables will show data at the provincial level only, with national totals given as well. Tables #1-3 and #13 are to be produced for the six-year aggregate only. The remaining nine tables are to be produced for each of the five years ('84 through '89) plus for the six-year aggregate. This gives a total of 67 tables.

List of Tables:

Farm Operator Characteristics:

1. Percentage of farms using chemical fertilizer by sex of farm operator, for six-year aggregate sample.

2. Percentage of farms using chemical fertilizer by age of farm operator, for six-year aggregate sample.

3. Percentage of farms using chemical fertilizer by education of farm operator, for six-year aggregate sample.

Farm Characteristics:

4. Percentage of farms using chemical fertilizer by farm size (total area planted and average per farm area for export, food, and total crops), for '84 through '89 plus six-year aggregate.

5. Percentage of farms using chemical fertilizer by value of agricultural sales (export, food, and total), for '84 through '89 plus six-year aggregate.

6. Average quantity of chemical fertilizer used (kg) by farm size (total area planted and average per farm area for all crops), for '84 through '89 plus six-year aggregate.

7. Average quantity of chemical fertilizer used (kg) by farm size (total area planted and average per farm area for export crops), for '84 through '89 plus six-year aggregate.

8. Average quantity of chemical fertilizer used (kg) by farm size (total area planted and average per farm area for food crops), for '84 through '89 plus six-year aggregate.

9. Quantity of chemical fertilizer used by value of total agricultural sales, for '84 through '89 plus six-year aggregate.

10. Quantity of chemical fertilizer used by value of export crop sales, for '84 through '89 plus six-year aggregate.

11. Quantity of chemical fertilizer used by value of food crop sales, for '84 through '89 plus six-year aggregate.

Coffee Production

12. Quantity of fertilizer used and the percentage of farms using it among farmers using fertilizer only on coffee (arabica, robusta), for '84 through '89 plus six-year aggregate.

13. Coffee yield by quantity of fertilizer applied per hectare of coffee (arabica, robusta) among farmers using fertilizer only on coffee, for six-year aggregate sample.

Agroecological Framework

Analyses of Census data beyond the national level have thus far been based (for good reason) on administrative boundaries (provinces and divisions). Unfortunately, such divisions are somewhat arbitrary with respect to the distribution of Cameroon's major agricultural production zones. Analyses based on such divisions may be of limited usefulness to those who desire information focused with an agricultural perspective. For programs such as the FSSRP, an agriculturally-based framework for analysis may provide more appropriate information. Numerous types of such groupings are possible. The FSSRP proposes to try one such grouping, with the idea that if it is useful, additional groupings may be employed, depending on information objectives.

It is suggested that certain data be regrouped using the framework of five "agroecological zones" defined for Cameroon. In theory, these zones more effectively group broad areas of similar agricultural practices. Boundaries of these zones may be approximated using provincial and divisional administrative lines. It is also possible to further subdivide divisions using "segments," although substantially more effort would be involved.

For the purposes of this exercise, administrative boundaries will be employed. The five agroecological zones and their administrative components (provinces and divisions) are given below.

Sudano-Sahelian Zone:
- Far North Province (all divisions)
- North Province (all divisions)

Guinea Savanna Zone:
- Adamaoua Province (all divisions)

Highlands Zone:
- West Province (all divisions)
- North-West Province (all divisions)

Semi-humid Forest Zone:
- Centre Province (Mbam, Haute Sanaga, Nyong et Mfoumou, Mefou, Nyong et Soo Divisions)
- East Province (all divisions)
- South Province (Ntem, Dja-et-Lobo Divisions)

Humid Forest Zone:
- South-West Province (all divisions)
- Littoral Province (all divisions)
- South Province (Ocean Division)
- Centre Province (Lekie Division)

Analyses performed using the agroecological zone framework will be for the production of tables #1-5 listed under Divisional-Level Analyses as well as for tables #4, 5, 6, and 9 listed under Cross-Tabulations. These tables will be produced for the six-year aggregate sample only, giving a total of nine tables.

ANNEX E

SCOPE OF WORK: CONTINUATION OF SUPPORT TO ONGOING INFORMATION GENERATION AND MONITORING FERTILIZER SUB-SECTOR REFORM PROGRAM

Background

The scope of work for "Support to Ongoing Information Generation and Monitoring" (PIO/T 631-0510-3-90016) contained three phases. The second phase, "Research Design" called for "working with identified collaborating projects or organizations on developing and finalizing the research designs for the surveys and agronomic trials" planned for 1989/90. This work was undertaken by two AMIS Project consultants during a TDY in July and August 1989. The two consultants made significant progress toward achieving the specified objectives, but, through no fault of their own, were unable to complete the specified activities.

The principal obstacle the consultants faced was that at the time of their mission, USAID and the GRC had not signed the documents necessary to use program funds in the Special Local Currency Account to finance monitoring activities. As a result, it was not possible to formalize the research designs, budgets, and timetables the two consultants negotiated.

In the time since the consultants left, the necessary documents identifying uses of program funds have been signed. Moreover, establishment of the GRC's Technical Support Unit (TSU) is imminent. Therefore, the time is ripe for completing the work necessary for establishing the monitoring network and permitting the collaborating organizations to carry out their tasks.

Activities to Be Performed

The AMIS Project will provide a team of two monitoring system consultants in early February 1990. The senior member of the team will be in-country for three weeks, with the other member remaining for another eight weeks or until the work is completed, whichever comes first. The team has two major responsibilities. The first is to establish a research coordination capacity within the FSSRP's Technical Support Unit. The second is to complete the work started in the previous consultancy by finalizing the arrangements for 1990 monitoring activities with those institutions participating in the FSSRP monitoring network.

Establish a Research Coordination Capacity Within the TSU

Under the terms of the amended FSSRP project description, the Ministry of Agriculture is to provide a suitable individual to serve as research coordinator within the FSSRP's Technical Support Unit. This research coordinator is charged with monitoring the implementation of the studies and surveys commissioned by the FSSRP and liaising with agricultural research organizations on issues related to fertilizer response and soil fertility. Once the research coordinator has been selected, the consulting team, along with USAID as necessary, will:

1. Thoroughly brief the research coordinator on the design of the FSSRP monitoring system and the organizations to be involved in implementation,

2. Accompany the research coordinator on an initial contact tour to the sites of the collaborating organizations,

3. Assist the research coordinator to prepare a year-long work program, which includes oversight of the activities envisioned for 1990 under the FSSRP monitoring system.

Finalize 1990 Monitoring Activities

The consulting team and research coordinator will work together to finalize the following 1990 FSSRP monitoring activities:

Annual National Survey. The consulting team will discuss with the Direction of Surveys (DS) in MINAGRI how best to incorporate more detailed questions on fertilizer use into the annual national agricultural survey. To the extent that new questions are needed, the consulting team will prepare draft questions and submit them to MINAGRI/DS.

Other Surveys. The consulting team will prepare complete Sub-Activity Programming Documents (SAPD) for the following surveys: (1) the seven province survey to be undertaken by MINAGRI/DS, (2) the North West Province detailed survey to be conducted by MIDENO/PEM, and (3) the West Province detailed survey to be conducted by UCD/Dept. of Rural Economics with possible collaboration with UCCAO/PDPRO. Each SAPD will contain, as annexes: a budget and timetable, the survey instrument and research protocol, and a signed letter committing the organization to performing the work.

In the case of the two detailed surveys, the survey instrument will need to be modified slightly to take into consideration recent comments.

National Fertilizer Response Data Base. The consulting team will follow-up on the proposal to establish, with the assistance of IFDC/Africa, a national fertilizer response data base within the National Soils Research Center. The first step is to arrange a formal GRC invitation to IFDC/Africa to send a representative to Cameroon for discussions and preparation of a work program. Subsequent steps, including consultation with IFDC in Lome, will be taken as appropriate and with the agreement of USAID/Cameroon.

Liaison with IRA/NCRE on Fertilizer Response Research. The consulting team will follow-up on discussion with IRA and NCRE about better incorporating fertilizer response into the ongoing research program.

Qualifications of the Consultants

The consultants should both have an M.S. or higher degree in agronomy, soil science, agricultural economics or a related degree. Between the two, they should have previous experience in survey design and computerized analysis of survey data and experience in the design, implementation, and analysis of agronomic trials in Africa. Both consultants must have a working knowledge of French and previous work experience in Africa. The senior team member should have at least three years of relevant African work experience.

Given the length of the consultancy, hiring the junior member of the team locally should be considered -- assuming a suitable candidate can be found.

AMENDMENT TO:
CONTINUATION OF SUPPORT TO ONGOING INFORMATION GENERATION AND MONITORING
FERTILIZER SUB-SECTOR REFORM PROGRAM
SCOPE OF WORK

Background

The scope of work for "Continuation of Support to Ongoing Information Generation and Monitoring" (PIO/T 631-0063-3-70113) contained two primary tasks. The first was to establish a research coordination capacity within the Technical Support Unit (TSU) of the Technical Supervisory Committee (TSC), and the second was to finalize the 1990 Monitoring Activities. This work was undertaken by two AMIS project consultants during a TDY which began in early February 1990 and is scheduled to end on April 19. The two consultants made significant progress towards the defined objectives, but through no fault of their own were unable to complete all specified activities.

Two obstacles faced by the consultants at the time of their mission prevented the completion of the defined objectives. The first was that TSU had not yet been created, so that "establishment of a research coordination capacity" within the TSU was not possible. The second limitation was that the Monitoring Fund Account to finance the information generation and monitoring activities had not yet been opened so that none of the 1990 monitoring activities could be officially finalized.

However, the document creating the Monitoring Fund is about to be approved, meaning that funding for the monitoring activities will soon be available. As such, activities can now be officially finalized and set in motion. Moreover, establishment of the GRC's Technical Support Unit (TSU) is imminent. Therefore, the next several weeks will be a critical period for completing the work necessary for establishing the monitoring network and permitting the collaborating organizations to carry out the activities. Additionally, two further tasks that relate to the Information Generation and Monitoring System have been identified that will be added to the previously mentioned tasks.

Activities to Be Performed

The AMIS Project will extend the present contract of the monitoring system consultant remaining in Cameroon by a period of six weeks. The activities to be performed, in order of priority, are as follows: 1) Finalization of 1990 Monitoring Activities; 2) Design of an FSSRP information brochure; 3) Establishment of a research coordination capacity within the FSSRP's Technical Support Unit; and 4) Interpretation of data generated under proposed Monitoring activity involving the production of supplementary tables from the Agricultural Census database.

Finalize 1990 Monitoring Activities

The consultant will finalize the following 1990 FSSRP monitoring activities:

Fertilizer Use Surveys. The consultant will complete the steps necessary to finalize Sub-Activity Programming Documents (SAPD) in order to set in motion the following surveys: (1) the seven-province survey to be undertaken by MINAGRI/DEAPA, (2) the North West Province detailed survey to be conducted by MIDENO/PEM, and (3) the West Province detailed survey to be conducted by UCD/Dept. of Rural Economics in collaboration with UCCAO/PDRPO.

National Fertilizer Response Data Base (NFRD). The consultant will follow-up on the steps necessary to prepare for the proposed NFRD preliminary "reconnaissance" mission. These steps are outlined in the final report of AMIS consultant Anthony Johnson.

The first step is to arrange a formal GRC request to IFDC/Africa to release or provide personnel for the preliminary mission in Cameroon.

Annual National Survey. The consultant will follow up on the proposal submitted to MINAGRI/DEAPA suggesting modifications of the Agricultural Census questionnaire related to the generation of more appropriate data on fertilizer use.

Further Analyses of Agricultural Census Database. The consultant will follow up on the proposal submitted to MINAGRI/DEAPA requesting that "supplementary tables" be produced from the census database. To the extent that production of the tables is possible, the consultant will prepare a SAPD for the activity, including a research protocol defining the types of tables to be produced and a budget.

FSSRP Information Brochure(s)

The consultant will design the format and contents of an FSSRP "information brochure" intended to disseminate information about the program to the general public as well as to those interested in direct participation in the fertilizer sub-sector. The informational content of the brochure(s) will be discussed with the FSSRP program manager and deputy program manager as to appropriateness. The design of the brochure will take into consideration the capabilities and limitations of local printing facilities. The brochure will be produced locally through a purchase order.

Establish a Research Coordination Capacity Within the TSU

Under the terms of the amended FSSRP project description, the Ministry of Agriculture is to provide a suitable individual to serve as research coordinator within the FSSRP's Technical Support Unit. This research coordinator is charged with monitoring the implementation of the studies and surveys commissioned by the FSSRP and liaising with agricultural research organizations on issues related to fertilizer response and soil fertility. Once the research coordinator has been selected, the consultant, along with USAID as necessary, will:

1. Thoroughly brief the research coordinator on the design of the FSSRP monitoring system and the organizations to be involved in implementation,

2. Accompany the technical coordinator on an initial contact tour to the sites of the collaborating organizations,

3. Assist the technical coordinator in the preparation of a year-long work program that includes oversight of the activities envisioned for 1990 under the FSSRP monitoring system.

Interpretation of Agricultural Census Data:

The consultant will interpret the data generated by DEAPA under the proposed activity "Further Analyses of the Agricultural Census Database." Interpretation and discussion of the data will be presented in a report that will includes supplementary tables produced by DEAPA.

Reporting

A final report will be produced by the consultant for the TSC. The report will contain the following; a background on the Monitoring System design and status of activities prior to the start of the consultancy; a description of the relationships established between the FSSRP and the various organizations involved in the Monitoring System; the status of all Monitoring System Activities, including an enumeration of follow-up steps for the activities; a status report on the NFRD including progress made, recommended options for proceeding, and information sources; a description of the status of the TSU and the progress made in establishing a research coordination capacity therein; a status report on the FSSRP information brochure; annexes including the final SAPDs created for the various activities, copies of proposals submitted to collaborating organizations, a references list, and a list of people contacted. Interpretation and discussion of further analyses of Agricultural Census data will be contained in a separate report.

Qualifications of the Consultant

The consultant should have an M.S. or higher degree in agronomy, soil science, agricultural economics, or a related degree. The consultant should have previous experience in survey design and computerized analysis of survey data and experience in the design, implementation, and analysis of agronomic trials. The consultant must have a working knowledge of French and previous work experience in Africa.

ANNEX F

LIST OF PEOPLE CONTACTED

Institut de Recherche Agricole (IRA)

Jacob Ayuk-Takem,	IRA Director, IRA/Nkolbisson
René Kaiser	Chief of Service for Research/IRCT Agronomist, Nkolbisson
Tooya Ngoubeyou	Librarian, IRA/Nkolbisson
Phillipe Nault	Unité Informatique, IRA/Nkolbisson
Claude Nankam	Station Chief/Plant Pathologist, IRA/Bambui
Ambe Tumenteh	Agronomist, IRA/Ekona

Centre National des Sols (CNS)

Joseph Bindzi-Tsala	Head of CNS, Nkolbisson
Louis Ambassa-Kiki	Soil Scientist, CNS, Nkolbisson
Jean Kotto-Samé	Soil Scientist, CNS, Nkolbisson
Martin Tchienkoua	Soil Scientist, CNS, Nkolbisson
Rosaline Njomgang	Soils Laboratory Supervisor, Nkolbisson
Joseph Bondje	Lab Technician (micromorphology)
Lucien Zeh	Lab Technician (particle size analysis)
Robert Tatou	Lab Technician (exchangeable Aluminum, soluble Phosphorus)
Stephane Mboning	Lab Technician (exchangeable bases)
Robert Moussa Ndinga	Lab Technician (free iron, moisture retention, and oxygen)
Jean Baptiste Fodjo	Lab Technician (total carbon and organic nitrogen)
Mr. Thongo	Lab Technician (total iron)
Boniface Nboma	Lab Worker (soil sample preparation)
Simon Lappe	Lab Worker (soil sample preparation)
Laurent Mbanga	Librarian, CNS, Nkolbisson

National Cereals Research and Extension Project (NCRE)

Emmanuel Atayi	Chief of Party, NCRE/Nkolbisson
Thomas Stilwell	Deputy Chief of Party, NCRE/Nkolbisson
Doyle Baker	Agricultural Economist, NCRE/TLU/Nkolbisson
J.A. Poku	Agronomist, NCRE/TLU/Nkolbisson
François Meppe	Agronomist, NCRE/TLU/Bambui
Dermot McHugh	Agricultural Economist, NCRE/TLU/Bambui
J. Kikafundi-Twine	Agronomist, NCRE/Bambui
Les Everett	Maize breeder, NCRE/Bambui

Ministry of Plan and Regional Development (MINPAT)

Mohamadou Talba	Secretary General, MINPAT, Yaoundé/President, TSC
Gabriel Ebayeh	Charge des Etudes, MINPAT, Yaoundé/Member, TSC.

Ministry of Agriculture (MINAGRI)

Felix Nkonabang	Direction of Agriculture, Secretary, TSC
Madame Djoh	Direction of Agriculture

Clobert Tchatat	Chef de la Division des Programmes Agricoles (DPA)
Niel Parker	Advisor to DPA, MINAGRI, Yaoundé
E. Njock	Librarian, Centre de Documentation. MINAGRI, Yaoundé
Lucien Bieko	Cellule de Gestion des Projets de Production, DPA

Ministry of Finance

Augustin Fongang	Member, TSC

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Paul-Pierre Pouansi	Deputy Director, DEAPA
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Agoum Anabel	Chief of Data Processing Section, DEAPA
Pierre Takou	Data processing section, DEAPA
Vincent Tchomte	Survey operations, DEAPA
Jules Mebou	Survey operations, DEAPA
Augustin Tchuinte	Ingineur Travaux Agricole, DEAPA

Cameroon Agricultural Policy and Planning Project (CAPP)

Jim Otto	CAPP Advisor, Data Management, DEAPA
Montie Wallace	CAPP Advisor, Statistics, DEAPA
Peter Wyeth	CAPP Advisor, Agricultural Economics

University Centre of Dschang (UCD)

René Owona	Director General, UCD
Simon Lyonga	UCD Chief of Research and Extension
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J. Tchoumboue	UCD Research Coordinator, Department of Animal Science
B. Lawane	UCD Professor, Agronomist, Department of Agriculture
François Kamajou	UCD Professor, Head, Department of Rural Economics
Jean Nyemba	UCD Professor, Department of Rural Education

Agricultural Education Project (AEP)

Peter Hartman	Chief of Party, AEP/UCD
William French	Research and Extension Advisor, AEP/UCD

Mission de Développement du Nord-Ouest (MIDENO)

Andrew Ndonyi	Project Manager, MIDENO, Bamenda
Fidelis Niba	PEM Coordinator, MIDENO, Bamenda
James Munang	PEM Officer, MIDENO, Bamenda
Mike Sabum	PEM Officer, MIDENO, Bamenda
George Yebit	Agronomist, Adaptive Research Unit/MIDENO, Bamenda

Projet de Développement Rural de la Province de l'Ouest (PDRPO)

Gilbert Soffo	Agronomist, Cellule de Suivi, UCCAO/PDPRO, Bafoussam
Emmanuel Djieya	Deputy Director, UCCAO/PDRPO

International Fertilizer Development Center (IFDC)

J.P. Vlek	Director, IFDC/Africa, Lomé, Togo
Joseph Nagy	IFPRI fellow, Agricultural Economist, IFDC/Africa
Jacob Teboh	Associate IFPRI fellow, IFDC/Africa
A. Uzo Mokwunye	Agronomic Research Coordinator, IFDC/Africa
Dr. Parberey	Managing Director, IFDC/Muscle Shoals, Alabama
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United States Agency for International Development

Tham Truong	Chief Mission Economist, USAID/Yaoundé
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Butch Amundson	Deputy Director, USAID/Yaoundé
John Balis	Agricultural Development Officer, USAID/Yaoundé
Norm Olsen	Program Officer, USAID/Yaoundé
Robert Shoemaker	Program Development Officer, USAID/Yaoundé
Gerald Hensley	Chief Controller, USAID/Yaoundé
Carlton Bennett	Regional Contracts Officer, USAID/Yaoundé
John Dorman	CAPP Project Manager, USAID/Yaoundé
Brian Steinwand	NCRE Project Manager, USAID/Yaoundé

ANNEX G

LITERATURE CONSULTED

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