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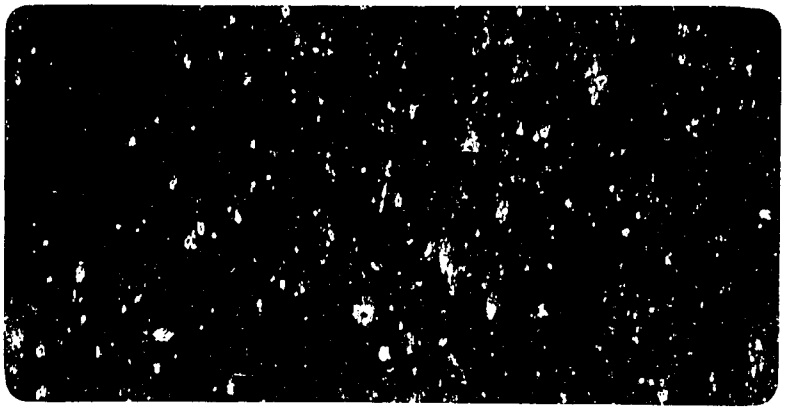

AGRICULTURAL DEVELOPMENT SUPPORT II
HAITI

University of Arkansas,
Fayetteville

A STUDY TO IMPROVE THE ACCURACY OF THE HAITIAN ANNUAL NATIONAL SURVEY FOR COFFEE PRODUCTION

ADS-II
Agricultural Development Support II Project

A STUDY TO IMPROVE THE ACCURACY OF COFFEE ESTIMATES FOR THE NATIONAL AGRICULTURAL SURVEY IN HAITI

USAID CONTRACT # 521-0092

between

The University of Arkansas, Fayetteville/Winrock International
and
The Haitian Ministry of Agriculture (MARNDR)

A Report Submitted to the ADS-II Project

by

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A STUDY TO IMPROVE THE ACCURACY OF COFFEE ESTIMATES FOR THE NATIONAL AGRICULTURAL SURVEY IN HAITI

The Purpose of This Study - Terms of Reference

The University of Arkansas/Winrock International ADS II project is working with the Haitian Ministry of Agriculture (MARNDR) to develop, test and implement a National Agricultural Survey for the annual production of select major crops and livestock in Haiti. The initial survey of several Departments has already been completed and it is planned for the survey to become operational for the entire country within the next year.

A preliminary analysis of data from four departments indicates that the national agricultural survey's open-segment area frame may be missing significant numbers of large producers of coffee. This sampling method has had some potential problems with estimates involving large farm sizes because the farm owner is often absentee and is not contacted in the field survey. It is suspected that there are few such owners of coffee lands. However, if there are, there could be a significant error in the estimates for this nationally important crop. Therefore, ADS II has requested a study to evaluate the situation and if the present open-segment area frame is potentially not giving accurate results, to recommend an improved sampling procedure such as a multiple frame sampling approach for the estimation of land area planted in coffee and the annual yield from these lands. It has already been suggested that the present open frame sample could be used for small farms and a list sample made of the large area farms.

Objectives Impedded Within the Terms of Reference and Some Related Issues

Within the terms of reference given by ADS II there are several questions presented which will be addressed along with many issues implied within them. These issues must be considered before any improved sampling design can be recommended. Among the questions specified for study are the following:

1. Is the error due to the present area frame sampling scheme significant?

2. If a list frame is to be used, what should its nature be (e.g., for large producers only)?

3. Would large producers cooperate?

4. Could lists of coffee buyers or producer organizations be substituted?

5. Would they provide the information?

6. Is their information reliable?

7. Are such lists currently available or would they have to be developed?

8. What are the expected costs of developing and maintaining such lists?

9. What additional staff requirements would be necessary?

10. What data gathering and data entry procedures are necessary to ensure that the multiple frame methodology does not produce double count estimates?

11. What other alternatives are possible, more cost effective and acceptable?

Among the issues implied in the ADS II terms of reference are:

1. Is there a need to have the field survey gather additional information beyond what it does now while doing the open frame sample?

2. Is local consumption (not sold to a speculateur or exporter) significant?

3. Is the amount of illegal export or import coffee significant?

4. Does the national agricultural survey take into account variables such as the weight per marmite (reported in the literature or from local, but anonymous sources) as anywhere from 4.5 to 6.0 pounds), that coffee weight reported in pounds by speculateurs or exporters are in fact metric pounds (500 grams), and that coffee is usually harvested from November to February, thus requiring ADS II to decide whether to split harvests by the calendar year or to record all of a single harvest as it is by most reporting agencies on the "coffee year" (October 1 - September 31)?

<u>From Terms of Reference to Study Objectives</u>

With these questions and issues to guide this study the following objectives will be addressed:

1. Summarization of relevant past findings on coffee in Haiti.

2. Evaluation of the availability of large producer information.

3. Consideration of alternative sources of data on large coffee plantations.

4. The design of an improved multi-frame sampling scheme.

5. The design of an improved open frame sampling scheme.

All of the recommendations resulting from this study will be made in the interest of maximizing the accuracy of the national survey.

A Synopsis of Pertinent Results from Previous Studies

The USAID and UNDP Libraries in Port-au-Prince were searched for reference materials. To enlarge on this information base, a series of interviews were undertaken with Ms. Stephanie Sequino (USAID coffee expert), several speculateurs and a few exporters. Ms. Sequino provided much information and valuable insight into the present day coffee market. Her help was much appreciated and is gratefully acknowledged.

There were several pertinent articles in the libraries discussing the world and Haitian coffee markets, previous donor agency projects to stimulate more coffee production and the technical aspects of coffee growing. The references section of this report gives complete citations of these documents (including their AID or UNDP call number). Included also is a reproduction of the bibliography from a report by Sequino. (Sequino, 1980) This has been included for those who want a perse in more detail than was required for this study the history and mechanics of Haitian coffee production.

The World and Haitian Coffee Production

Haiti produces only a small percentage of the total world market supply, but its renowned flavor comes from the mixture of upland and lowland beans that are exported.

Output

The total production of coffee has been reported as relatively stable over the last thirty years (see Figure 1 from Sequino, 1985 on the next page and Table 1 from the USDA report Anon., 1980). The fluctuations are attributed primarily to weather conditions which influenced the bean production in that year. However, the proportion exported has been decreasing steadily and there is some evidence that total production may be declining now as a result of the average old age of plantations (30 years), poor cultural practices and the short term income gains to be had by growing alternative crops such as maize or beans on land converted from coffee growing (see Figure 2 from the Sequino report on the next page).

Figure 1

Coffee Production and Exports (Five-Year Averages)

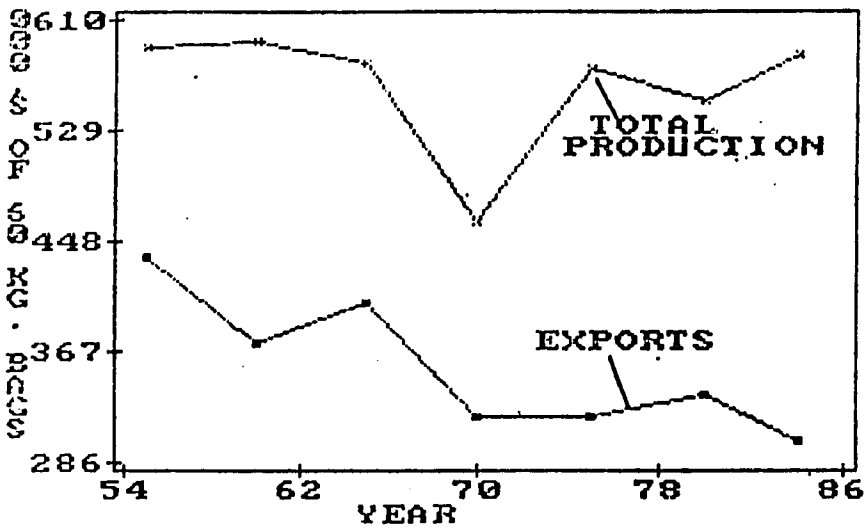
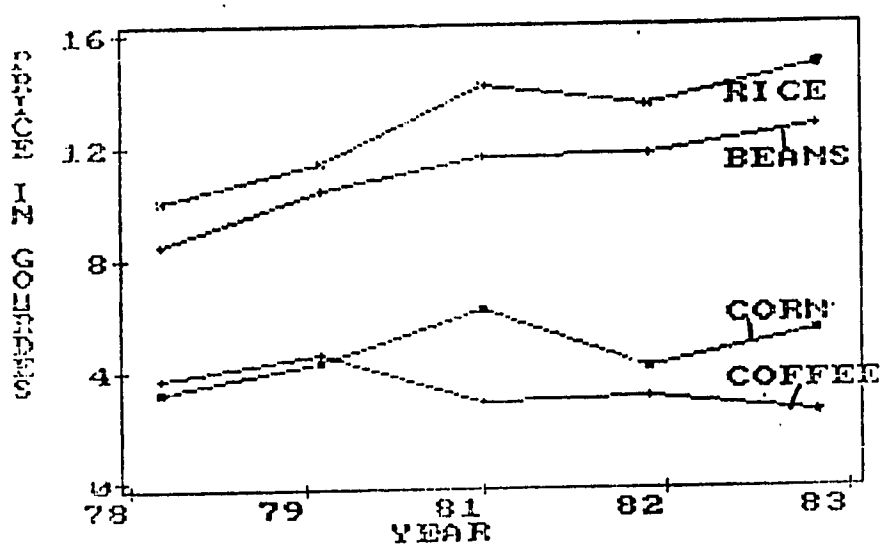


Figure 2

Price Evolution of Principal Food Crops and Coffee



Haiti's production is grown in all regions of the country. JWK International reported the 1972-73 harvest by districts as:

District	% Total Production	District	% Total Production
Cap Haitian	26	Port-de-Paix	7
Gonaives	5	St. Marc	0.9
Croix des Bouquets	7	Port-au-Prince	10
Petit Goave	5	Jeremie	18
Les Cayes	12	Jacmel	9

Importance of Coffee to Haiti

Coffee is one of the primary income generators in rural Haiti. Depending upon the literature source there are an estimated 180,000 to 384,000 peasants growing coffee. (Girault, 1982; JWK, 1976) The value of this crop goes beyond the immediate income received from its sale. When they are dried and stored, the coffee beans can serve as a cash reserve. Peasants are also often reported to use their future production as a credit source with speculateurs or exporters. (Note: the literature says there are more than 800 speculateurs and about 18 exporters in the country - one of the exporters interviewed said that there are now fewer than 10 of them) Coffee also serves as a hedge against the failure of other crops. Often when crops such as maize or beans fail because of drought, coffee will relatively unaffected. Further, the plantations have served well as soil stabilizers. Much coffee land is subject to substantial soil erosion or nutrient losses if it is converted into the production of annual crops.

The GOH also finds coffee as one of its principal income generators. About 7 percent of its revenue is generated from coffee related taxes and the only other producer of more foreign exchange is the money sent home by Haitians living outside the country. (Combrony et al, 1981; Heidenberger et al. 1987; Sequino, 1985)

Farm and Market Settings

Peasants growing coffee were reported by JWK International as having an average farm size of 2.7 hectares (Ha) and the 3-4 parcels which made up this farm grew coffee on about one-half of this area. Several authors reported that yields per unit area Haiti are low (200 - 250 Kg/Ha) compared with other countries. JWK International cited that all coffee is grown by peasants (small farmers) except for one large farmer in the Cap Haitian area. Sequino stated that there are also some other recently established large farmer holdings in the Thiote area. (Sequino, 1987)

Peasants can dispose of their harvest in several ways. These include self consumption, sale for local consumption and sale to a speculateur, exporter, cooperative or a washing factory. The cooperatives sell their coffee to exporters. Coffee sold to a speculateur or an exporter is usually in the form of dried beans and takes place in towns designated by GOH as buying centers. These purchases by speculateurs and exporters are monitored by OPREDEX agents. OPREDEX is a bureau within the Ministry of Commerce.

There are only a few washing factories in Haiti and the percentage sold to washing factories is small. The factories buy the fresh, ripe coffee cherries rather than their dried beans. Washed coffee produces a higher grade beverage than that which can be brewed on average from farmer dried beans .

Coffee which is to be marketed for incountry consumption is provided by the exporters. After the coffee beans are bought by the speculateur and the exporter, the beans are sorted for quality and those which do not meet export standards are delivered to factories for processing, packaging, and distribution for sale here in Haiti.

Previous Projects to Stimulate Production

There have been several projects funded by various donor agencies (primarily USAID and UNDP) directed at improving coffee production. They have been concentrated on:

1. Stimulating credit.

2. Improving agricultural technology (cultivation techniques).

3. Coffee center establishment (demonstration of 2 above).

4. Formation of cooperatives.

5. Road construction.

These projects have had little visible, beneficial effect, other than those involved with road construction and the establishment of some cooperatives. (Anon., 1976; Ester, 1975, 1977, 1977; Olson, 1984)

Technical Aspects of Coffee Culture

Only a few of the articles reviewed discussed in detail the technical, cultural aspects of growing coffee. The JWC International report, however, did have a good bibliography (pp. 123-127) on coffee in general, including its culture. Ester also had some photos illustrating various aspects of growing this crop and discussed the UNDP efforts to establish a training center and extension program to improve coffee growing by peasants.

Results from My Further Study to Identify Large Producers

The terms of reference and many of this study's objectives involve identification of whether large owners exist, and if so, how can they sampled properly using a list or other sampling scheme. Over the past two weeks, two exporters, several speculateurs and many coffee growers have been contacted by telephone or visited in the field. The general concensus from this has been that there may well be more large farmers than previously thought, but an exact number can not be given.

It is also concluded that any sampling scheme involving speculateurs or exporters will have serious implementation problems. Identifying and locating the speculateurs would be excessively time consuming as there are more than 800, many of which change from year to year. However, if this were vital it could be done through contact with the OPREDEX agents in the official buying centers. There are relatively few exporters, but at least one of those interviewed stated that for various reasons it might not be possible to obtain the cooperation of all of them.

Potential Ways of Improving the ADS II Estimate of Coffee Production Area and Yield

The first question to resolve is whether the present open frame sample is giving a representative sample of production or are there significant areas being left unsampled. As stated in the previous section, there is a possibility that there are large plantations, while the literature and the present survey results generally indicate that there are not. Thus, the question can not be resolved at this time and this dictates that it must be answered if the reliability of the survey is to be confirmed or improved through the implementation of an improved sampling scheme. Also implicit in this question is the development of a methodology to estimate the area and amount of coffee used for local production and for illegal export.

Using the above background and my previous sugar cane study, there appear to be two potentially feasible methods of inventorying large farmers. These are remote sensing techniques and list sampling.

Remote sensing

My previous report on sugar cane indicated the potential available remote sensing techniques including aerial observer transects, air photo interpretation (transects or area measurement on the photos) and satellite image interpretation (visual or automated interpretation of SPOT or LANDSAT TM imagery). One can eliminate immediately the use of aerial observer transects and the use of satellite imagery. The cost of

rental aircraft flight time would be prohibitive and the use of "free" GOH aircraft is not possible under present circumstances because of the difficulties in requisitioning one. Available satellite imagery (TM) does not have the resolution and the purchase and analysis of new TM or Spot imagery would be several thousands of dollars, even if it did have the resolution. As will be shown below, it is unlikely that even the 10 meter SPOT resolution would be adequate.

Aerial photos have been used to study coffee in other countries such as Costa Rica. There is good quality 1978 country wide coverage available and some coverage of a coffee area near Beaumont was examined to find if the larger coffee groves there could be detected. Three stereo pairs each of black and white panchromatic (BW) and color infrared (CIR) 1:40,000 scale photos were examined in Port-au-Prince with a non-magnifying mirror stereoscope and the interpretation field checked the next day while I was in the area interviewing some speculateurs and coffee growers.

The interpretation was not satisfactory. A positive correlation between office interpretation and the field check was not found. The scale appears too small, even if the photos were viewed with magnification. Note that this is said from previous experience, not from an actual test of these photos. The mixture of secondary forest and coffee plantations, both of which are often intermixed with various agricultural crop associations would probably require photos at a scale of 1:10,000 or larger to allow an interpreter to successfully differentiate the coffee production areas. The cost of obtaining this photography would probably exceed 50,000 dollars. At this time the use of remote sensing probably is not feasible.

List and Open Frame Sampling Combined

List sampling could be combined with the existing open frame sample to achieve a more representative estimate of total coffee production areas. It is assumed that the list would be of farmers having coffee groves over some specified amount of area.

The Sampling Scheme

The procedure for using this scheme would be as follows:

1. Form a list of farmers. The possible ways of forming this list are discussed below.

2. Select at random a specified proportion or number of farmers for each Department or other sampling unit. Replace any farmers whom have already been interviewed.

3. Locate the farmers selected above and perform the interviews.

4. Work-up the area and yield estimates and their associated errors.

5. Combine the estimates for the list and open frame samples. The total area and yield estimate would be obtained by summing the areas and the yields from each sample. The "per unit" (area, farm, etc.) would be computed as weighted averages (i.e., the basic data must be used in making the calculations. It can not be done by simple averaging of the averages obtained from the open frame and list samples).

The combined error estimate in terms of a standard deviation or standard error would be obtained in the same way. This will give the best approximation available.

Obtaining The List

As outlined above, the first step is to obtain a farmer listing. There are several possible sources of listings which would give the names of the large coffee producers. These include project listings of the farmers themselves, the speculateurs who would know the farmers, OPREDEX agents who would know the speculateurs and probably the farmers in their zones, and the exporters. The possible of the sources are each discussed in turn below.

Listings from projects such as ADS II and any other project I know of would not be satisfactory. They are all incomplete in some way. For example, such compilations often do not list the entire population or are biased towards some part of it (such as ADS II towards small farmers).

If all or some select portion of the speculateurs were contacted, they could be requested to provide the names and locations of the large coffee farmers. This would be difficult as there are more than 800 of them and they change from year to year. A partial list of speculateurs can be obtained from Stephanie Sequino and from my notes accompanying this report, but these are incomplete. However, if a list of speculateurs is needed it could be obtained by contacting each of the OPREDEX field agents. However, there is a more efficient way of obtaining the farmer list as will be discussed below.

The exporters could also provide listings of speculateurs. Again, for reasons of efficiency this will not be considered further. However, if for some reason the exporters need to be contacted, they are listed in the table provided by Ms. Sequino on the next page.

Probably the most efficient way to obtain the needed list will be from the OPREDEX field representatives in the official buying towns. It is reported that they are very familiar with the coffee growers in their areas and would certainly know the

EXPORTER SHARE OF COFFEE MARKET — 1985-86

(in 60 kg. bags)

EXPORTER	VOLUME EXPORTED	PERCENTAGE
Wiener	45,617	16.52 %
USMAN	44,310	16.05 %
Madsen	37,110	13.44 %
Kersaint	27,363	9.91 %
Leon Baptiste	24,065	8.71 %
Novella	22,438	8.12 %
Dufort	21,840	7.91 %
Bennett	19,245	6.98 %
Vital	8,580	3.11 %
CCH	8,527	3.09 %
J.B. Charles	5,305	1.92 %
Max Vieux	4,475	1.62 %
Lespinasse	2,335	.84 %
Edmond Pierre	1,925	.70 %
Fred Eyssalene	1,475	.53 %
Luc Paultre	1,020	.37 %
Copexim	500	.18 %

46.01%

55.92%

*Note: In 1984-85, the percentage of the market controlled by the top three exporters was 45.11% and by the top four was 57.52%.

names of any large farmers. The regional OPNEDEX districts and the names of the towns where they have agents is as follows:

Cap-Haitian
- Acul-du-Nord
- Bahon
- Borgne
- Cap-Haitian
- Carice
- Dondon
- Grande Riviere
- Limbe & Cam-Coq
- Limonade
- Milot
- Mont-Organise
- Pilate
- Plaisance
- Plaine-du-Nord
- Port Margot
- St. Raphael
- Ste. Suzanne

Croix-des-Bouquets
- Croix-des-Bouquets
- Arcahaie
- Thomazeau
- Grand Bois
- Mirebalais
- Maissade

Port-au-Prince
- Thiotte
- Fond Verrettes
- Belle-Anse
- Riv. Froide
- Kenscoff
- Bodarie
- Mapou
- Beloc
- Trouin

Petit-Goave
- Petit-Goave
- Grand-Goave
- Anse-a-Veau
- Pte. Riviere de Nippes
- Pt. Trou de Nippes
- Miragoane
- Fonds-des-Negres
- L'Asile
- Baradares
- Aquin

Port-de-Paix
- Port-de-Paix
- Saint Louis du Nord
- Anse-a-Foleur
- Jean Rabel
- Chansolme

Gonaives
- Marmelade
- St. Michel
- Gros Morne
- Gonaives

St. Marc
- St. Marc
- Pte Riv. Artibonite
- Verrettes
- Dessalines

Loscanobas
Savonette
Belladere
Baptiste
Hinche

Jacmel
- Jacmel
- Cayes-Jacmel
- Marigot
- Marbial
- Bainet

Les Cayes
- Camp-Perrin
- Maniche
- Chantal Canon
- Cavaillon
- St. Louis du Sud
- Coteaux
- Damassin
- Port-a-Piment
- Chardonnieres
- Les Anglais
- Tiburon

Jeremie

Jeremie	Desormeaux
Dame Marie	Leon
Chambellan	Castillon
Duchity	Lobino
Martrand	Roseaux
Moron	Bois Sec
Pestel	Anse d'Hainault
Corail	Les Irois
Abricots	

These agents could be contacted in each of the buying centers listed above at the "Bureau Cafe" and the lists of large farmers compiled. It is suggested that this be done by ADS II survey staff that were involved with the open frame survey of the Department where the particular agent is contacted. This should increase the efficiency of compiling the lists as these staff will have geographic familiarity and knowledge if a particular grower given by the OPREDEX agent has already been interviewed. Once these lists have been compiled, the list sample and combined estimate can be carried out as described above.

Other Sampling Issues To Consider

There are some other factors which will influence the acceptability and accuracy of the suggested combined sampling scheme. These include the additional cost and staffing requirements to do it, the significance of local sales and self consumption, and the influence of illegal export/imports on the sample estimates.

Additional Costs and Staffing

The additional cost of this sampling scheme would primarily come from the additional time required for existing staff to do the field and office work, plus the expenses involved with the field travel (lodging, gas, etc.). Of course, if existing staff are fully committed, other staff will have to be recruited. Assuming that there will not be many large growers reported by each OPREDEX agent and that there will not be that many in total, I would estimate that on average the field work for each Department could be completed by one person in less than two weeks the first time this process is done. It would probably take only half to three quarters of this time in subsequent years.

Local Sales and Self Consumption

The combined open frame and list sampling scheme should reflect all of the coffee produced by all farmers. The ADS II field interview questions must be designed to assure that the farmers give them yield data that reflects their total harvest, not just what they sold to a speculateur or exporter. This could be easily neglected, particularly when coffee is consumed by the farmer's household.

Illegal Export/Imports

Much the same thing can be said here for Haitian grown coffee which is being illegally exported. There is no guarantee that a farmer will report his production if he sells it illegally. However, it seems likely that farmers will give a proper response if they are not asked where they sold their production.

The illegal import presents no problem to the survey's accuracy unless farmers are buyers of these imports and are then reselling them as their own production. It has been suggested in my interviews that this is not the case as the buyers are speculateurs or Haitian exporters. One other concern that the Survey might have is that the Ministry of Commerce figures will reflect these amounts and the survey data will not. This might produce some discrepancy between the two when one would assume that they would be fairly close.

There are several sources from which estimates of this illegal trafficing can be obtained. These include the OPREDEX agents and the Agricultural Attache at the United States Embassy in St. Domingo, DR.

Recommendations

There may be a significant number of large coffee growers that are not being sampled in the present open frame sampling scheme. It is recommended that a combined open frame and list sample as detailed in this report be undertaken to find if there are large growers. If there are, the procedure should be followed each year. If not, then ADS II has to decide whether to interview all of these producers and add their data to that of the open frame survey or to just ignore them, assuming their contribution is insignificant.

References

As mentioned earlier, the references have two sections. The first will be for the documents which I cited in this report. This will be followed by a copy of bibliography from the report cited below by Stephanie Sequino.

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References for Further Background

The bibliography from the Seguino report is reproduced on the next three pages. It is included to give further references for those interested in more detail and background on coffee than was required by the terms of reference for this report.

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