

MAI Z E P R O D U C T I O N A N D M A R K E T I N G

I N T H E G O M O A A R E A

O F T H E

C E N T R A L R E G I O N O F G H A N A

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SUMMARY

1. A pilot study has been conducted into maize production and marketing in the Gomoa area in the Central Region of Ghana.
2. Production costs ranged from $\text{¢}36.00$ to $\text{¢}51.00$ per acre for those using neither fertilizer nor improved seeds and from $\text{¢}34.00$ to $\text{¢}70.00$ for the few farmers who used fertilizers and improved seeds.
3. Labour was the item of highest cost in maize cultivation in the area. Labour input ranged from 34 to 49 mandays per acre for those who used neither fertilizer nor improved seeds and from 34 to 78 for those who used these inputs.
4. Yields averaged 3 bags per acre but ranged from 1 to 8 bags. Total output by the 50 farmers was 458 bags or 47 long tons of shelled maize.
5. Most of the farmers stored part of their maize before sales. Raised rectangular bamboo sheds were the commonest storage barns. The modal storage period was eight months though some farmers stored for as long as eleven months.
6. The modal storage period coincided with May when the level of maize prices is usually at or near its peak in Ghana.
7. Storage losses encountered ranged from 0 to 44 percent of total farmer's output and averaged 12 percent.
8. Prices received by the farmers ranged from $\text{¢}6.00$ to $\text{¢}28.00$ per bag and averaged $\text{¢}18.80$.

9. The average gross revenue derived from maize was $\text{¢}114.63$ per farmer and ranged from $\text{¢}8.00$ to $\text{¢}495.00$ in the sample. This excludes the value of the maize used by the household.
10. Household use of the maize per farmer averaged 36 percent of the total output while the total marketed surplus produced by the 50 farmers was estimated to be 52 percent of their total production.
11. Most of the farmers made little or no efforts to find marketing avenues outside their own villages.
12. Small scale itinerant dealers bought the bulk of the farmers' produce but they did not have any prior arrangement with the farmers.
13. Most of the maize produced in the survey area was supplied to the Accra, Swedru, Apam and Cape Coast markets.

MAIZE PRODUCTION AND MARKETING IN THE
GOMOA AREA OF THE CENTRAL REGION
OF GHANA

A.. INTRODUCTION

1. Maize plays a very significant role in the Ghanaian economy. It is a source of food and personal incomes for a large section of the population and it also features prominently as a source of animal feed. A staff of the Agricultural Economics Division, Ministry of Agriculture (1962) estimates that between 90-95% of the total national output of maize goes into human consumption. He estimates further that maize is the principal source of food for 60-70% of the Ghanaian population (1 p.9). Evidence of the importance of this crop to the nation is shown by the concern expressed by governments in the number of policy measures taken to augment its production. The most recent of these policies have been taken under the "Operation Feed Yourself" programme where government has given the Food Production Corporation and the State Farms Corporation large production targets and financial support to achieve these targets (8). The Food Distribution Corporation and the Grains Development Board have also been recognised and funded to service maize production by way of ensuring ready marketing outlets for all the maize produced. Minimum guaranteed prices have also been announced apparently to boost production and to check violent price fluctuations.

Objectives

2. In spite of all these measures maize prices have remained persistently high in recent times (5). These high prices have been attributed to a number of reasons. It is believed by one school of thought that production has not been able to keep pace with demand; while another school believes that production is adequate but that distribution is inefficient. There is yet another school of thought which holds the view that the high maize prices is a function of both inadequate production and inefficient distribution. There is however a dearth of evidence to prove or disprove each of conjunctures. The objective of this study is therefore to highlight the conditions of traditional maize cultivation in the Gomoa area, outline the costs involved; estimate the output of maize, the marketed surplus.

farm storage period and losses and to highlight the type of marketing outlets available to the farmers in the area. It is believed the information obtained would throw light on the general maize situation in the country.

Methodology

3. The Gomoa area¹ was selected for the study because of the following reasons - The area has long been identified as one of the largest maize producing areas in the country. Evidence of this is given by a staff of the Ministry of Agriculture (1962) (1,p.4) and by data generated from 1970 Agricultural Census (see appendix Table 1). The Gomoa area is the nearest of the 4 largest maize surplus areas in Ghana to Accra. It was therefore most convenient to select this area for such a pilot study.
4. The study is also centred around the small scale (traditional) farmer because the latter has been responsible for over 95 percent of the total national output of the crop (see appendix Table 2) and it is believed that the small scale farmers shall continue to produce most of the country's maize for a very long time to come.
5. To select the farmers for the study, the Swedru-Apam Agricultural District was divided into seven blocks; three of which were randomly selected as the survey areas. A list of all the farmers occurring within the areas used by the Ministry of Agriculture in the second phase of the 1970 Agricultural Census was obtained. Using this list a total of 70 farmers were randomly selected for the study. These 70 farmers occurred within the following villages: Ekwankrom, Aboso, Abodon, Jukwa, Nduem, Wasa, Dawuramong, Koforidua, Osedze and Pinanko. The other villages were Onyadze, Mpruman, Abutia and Assen. It must be mentioned however that only 50² out of the farmers originally selected co-operated fully to the end of the survey. The rest either refused to co-operate in course of the survey or were out of their villages for the most part of the survey period and therefore could not be contacted.

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1. The Gomoa area forms the larger part of Swedru Agricultural District.
 2. The number includes 15 farmers who were not in the original list but who were substituted into list because of their agreement to co-operate to the end.

6. The actual survey was conducted in two separate phases. The first was carried out from February to May, 1972, to estimate the production costs of 12 of the selected farmers in the villages of Gomoa Wassa and Nduem. This entailed weekly visits to and interviews with these farmers about their maize cultivation activities. Questionnaires were used in the exercise. Use was also made of some field assistants from the Ministry of Agriculture who were living with some of the farmers. Questionnaires were also used in the second phase in which attempts were made to interview fortnightly all the 70 farmers in the sample. The second phase of the survey was started in early July 1972 and ended in the middle of August, 1973 when the last farmer in the sample had finished the sale of all his 1972 major season maize.

7. In the study of production costs, 12 farmers at Gomoa Wassa were used. The choice of Gomoa Wassa was made because its location was central to all the villages selected for the entire study. The vegetation was the same as in the other villages while the wage rate of ₵1.00 per manday of labour was also common to all the villages. It was also possible at Gomoa Wassa to make use of some field assistants of the Ministry of Agriculture who were making farm enumerations at the village. The twelve farmers studied comprised five who used both improved seeds (Diachol 153) and fertilizers and seven who used neither. All the farmers were asked to indicate the type and amount of labour (the number of people, number of days taken and where possible hours) used to execute the various maize cultivation activities and to give the quantities and value of the non-labour inputs used or expended.

Some problems encountered

8. The cost of cultivating an acre of maize may vary considerably depending among other things, upon vegetation type, technology of production (the use or non use of mechanized services, fertilizers etc.) and upon the efficiency of labour utilization and supervision. Costing the operations involved in traditional farming practices in Ghana presents two important problems.

The first involves the determination of adequate opportunity cost of family labour expended and the other input factors such as planting materials supplied freely from the family's resources. In this study, family labour has been awarded the opportunity cost of £1.00 per manday - the rate which was obtaining during the survey period on the local (village) labour market. The second problem encountered in costing traditional farming practices in Ghana relates to the practice of inter-cropping which prevails very widely throughout Ghana. For example data generated from the 1970 Agricultural Census (Ministry of Agriculture) indicated that 84 percent (754,000 acre) of the total land area of 900,000 acres used for the cultivation of the major season maize in 1970 was intercropped (6 p.82). In practice more than one crop is intercropped with the maize. In the Gomoa area the intercrops were usually cassava and vegetables. Apart from the fact that the effective yields of the individual crops may be reduced, it is usually difficult except arbitrarily, to apportion to the individual crops the cost of (joint) operations like land clearing and cultivation which benefit all the crops. To get around this problem only the production costs of farmers who cultivated pure stands of maize were studied and are presented in this report.

B. PRODUCERS OF MAIZE IN GHANA AND SCALE OF PRODUCTION

9. Maize production, like the production of most other crops in Ghana, is largely in the hands of the small scale traditional farmers. There are however some individuals, co-operative societies and other organisations in large scale maize production but total output of maize from these sources is insignificant vis-a-vis total output from the small scale farmers. Appendix Table 2 gives acres of maize produced (1966-1968) by type of holding (1966-1968). Corresponding figures before 1966 and after 1968 are not available. The table shows that traditional (small scale) farmers were responsible for 97, 97 and 96 percent of the maize produced in 1966, 1967 and 1968 respectively. Although more recent data are not available there is no reason to believe that the situation has changed much since 1968. On the contrary, the indications are that the traditional farmer would continue to be the major overall producer of maize for a long time to come.

Field Production

10. The sizes of maize holdings are generally small. In the 1970 Agricultural Census the average size of maize holding was estimated to be 2.2 acres in the major season and 1.8 acres in the minor season (6,p.84). The holdings found in the survey ranged from $\frac{1}{2}$ an acre to 30 acres and averaged 5.0. This means that the holdings were larger than the national average.

None of the farmers in the sample used mechanized services in the cultivation of maize. The cutlass and hoe were the only tools used. This situation contrasts with that in the Ejura area in the Northern Ashanti where many farmers rely on tractor services for land clearing (3). Most of the farmers did not use improved seeds nor fertilizers. They depended upon the previous seasons crop for their seeds. In this regard the situation in the Gomoa area was comparable to that in Ejura area where only 5 out of the 111 or less than 5 percent of the farmers randomly studied used fertilizers and improved seeds, for maize production while none of the 41 farmers studied in a similar survey in Wenchi area used these inputs (3). It must be emphasized that although maize holdings were found to be generally small the average farmer, (in the sample) was found to produce not only for subsistence but some surpluses over domestic requirements for the market.

11. Mention must be made of the fact that certain organisations exist to give institutional support to farmers (including maize producers). These organisations include the Crop Production Division of the Ministry of Agriculture which carries out extension work; the Seed Multiplication Unit of the Ministry of Agriculture which should provide improved planting materials for farmers and the Banks especially the Agricultural Development Bank and the National Investment Bank which provide institutional credit facilities to farmers in general.

Maize Production Costs

12. Table 1 gives a break down of farmers production costs. The cost of cutlass and other farm implements are excluded because of the difficulty in assessing what fraction of their cost to charge against maize production

since these implements were also used for non-maize activities as well.

13. Table 1 also gives a comparison of factor inputs and production costs between the farmers who used improved seeds and fertilizers and those who utilized neither. The most important single item of cost to the farmers was found to be labour. Labour alone accounted for between 80 to 95 percent of the total production costs of maize. Both hired and family labour were used by the farmers but hired labour was used mostly in land preparation and weeding. In all an average of 39 mandays were used per acre by the farmers who used neither fertilizers nor improved seeds. The range of labour used was 34-49 mandays per acre. Of the 39 average mandays, hired labour comprised 26 mandays per acre while the rest was made up of family labour. Farmers who used fertilizers and improved seeds required an average of 45 mandays of labour to cultivate one acre of maize. Labour used by these farmers however ranged from 34 to 78 mandays per acre (see Table 1). Wage rate was ₦1.00 per manday on the village's labour market and as such family labour has been awarded the opportunity cost of ₦1.00 per manday in the estimation of production costs. For the farmers who used neither fertilizers nor improved seeds it cost an average total ₦41.00 to cultivate one acre of maize. This comprised ₦39.00 of labour costs and ₦2.00 for planting materials. Their range of production costs however was from ₦36.00 to ₦51.00 (Table 1). However the total average value of all purchased inputs (all being hired labour) used by these farmers was ₦26.00 per acre. This would represent the total variable cost of production per acre, if family labour being unpaid for were deemed to have zero opportunity cost.

14. It cost the farmers who used improved seeds and fertilizers an average of ₦52.00 to cultivate one acre of maize - This comprised ₦36.00 of purchased inputs (hired labour, fertilizers and seeds) and ₦16.00 being the value or opportunity cost of family labour used. Estimated average yields were $4\frac{1}{2}$ bags or 1035 lbs. of shelled maize per acre for the farmers who used neither improved seeds for fertilizers and about 6 bags for those who used these inputs. This means that it cost the more progressive farmers (users of fertilizers and improved seeds) only ₦8.50 to produce a bag (230 lbs.) of shelled maize while it cost the less progressive ones ₦9.11 to produce the same quantity of maize.

Table 1

MAIZE PRODUCTION COSTS (PER ACRE) AT GOMOA WASA

Operation/ Input	Farmers Using Neither Fertilizers Nor Improved Seeds						Farmers Using Fertilizers And Improved Seeds					
	Total Av. Labour (Man- days)	Range of Total Labour (Man- days)	Total Av. Labour & Other Costs ₦	Range of Labour & Other Costs ₦	Total Av. Hired Labour Involved (Man- days)	Cost of Hired Labour & Other Purchased Inputs	Total Av. Labour Man- days	Range of Total Labour	Total Av. Labour & Other Costs ₦	Range of Labour & Other Costs ₦	Total Av. Hired Labour Involved (Man- days)	Cost of Hired Labour & Other Purchased Inputs ₦
Land Preparation	7	4-12	7.00	4.00- 12.00	6	6.00	7	4-12	7.00	4.00- 12.00	6	6.00
Planting Material			2.00			-			1.20			1.20
Planting	5	3-8	5.00	3.00- 8.00	2	2.00	5	3-8	5.00	3.00- 8.00	2	2.00
Fertilizers	-	-	-	-	-	-			5.60			5.60
Fertilizer Application	-	-	-	-	-	-	6	3-8	6.00	3.00- 8.00	3	3.00
Weeding(2x)	20	16-29	20.00	16.00 29.00	15	15.00	20	16-29	20.00	16.00- 29.00	15	15.00
Harvesting	7	2-16	7.00	2.00- 16.00	3	3.00	7	2-16	7.00	2.00- 16.00	3	3.00
TOTAL	39	34-49	41.00	36.00- 51.00	26	26.00	45	34-78	51.00	34.00- 78.00	29	35.80

Estimated output of maize: Average $4\frac{1}{2}$ bags,
Range 3.5-8 bags per acre.

Average 6 bags, Range 3-8 bags per acre

This indicates that all things being equal it was more profitable to use improved seeds fertilizers for the cultivation of maize. It must be mentioned that the above cost do not include storage cost and where applicable marketing costs which are borne by the farmers.

C. MAIZE STORAGE

15. Storage is strictly speaking a marketing function. Properly performed, it adds time utility to a commodity and spreads its supplies evenly from one production season to another. It was found from the survey that considerable amount of maize storage occurred at the farm level or within the farm gate and that most of the farmers stored their maize. Forty-four (88 percent) of the farmers studied stored their maize for various periods before sales while only 6 (12%) sold all their produce immediately after harvest. It must be mentioned however that on the average the farmers who did not store their maize cultivated smaller acerages than those who stored their products. The latter group cultivated between 1 and 30 acres or an average of 5.8 acres of maize each while the holdings of those who did not store their products ranged from 1 to 4 or averaged to 3.3 acres per farmer.

Storage Structures and Costs

16. Raised rectangular bamboo sheds were by far the commonest maize barns in the survey area. They varied considerably in dimension and construction costs. The capacities of the barns ranged from 72 to 1296 cubic feet and they cost from ₱8.00 to ₱34.00 in both material and labour time to construct. The barns were either constructed on the farms or in the villages near the farmers' houses and in a few cases in the farmers' kitchens. Only nineteen out of the 44 farmers storing their maize treated the stuff with preservatives. This means that most of the farmers were still not treating their maize before/during storage. This may be the cause of the high storage losses incurred. The preservatives used were woodash, gammalin, Aldrin, Edib, Sevin and Idrox. Four farmers used sevin; 4 used gammalin while five of them used woodash. Woodash was normally obtained free of charge while between 50 pesewas and ₱7.20 were spent on sevin and the other chemical preservatives used.

Length of Storage Period

17. Major season harvest started in late July and ended by the end of September. Majority of the farmers 28 (56%) studied however accomplished their harvesting in August; 18 (36%) in September while only 4 (8%) completed harvesting in late July and early October. Forty-four of the farmers studied stored their maize for various periods before sales. The maize was stored in the husk. Periodic checks on the maize left in (the barn) storage provided the following information. Only one of the farmers stored part of his total harvest for up to eleven months. The rest stored for shorter periods. Table 2 gives the frequency distribution of storage periods.

Table 2 Frequency Distribution of Storage Periods

<u>Length of Storage Period (Month)</u>	<u>No. of Farmers who finished sales of all maize</u>	<u>% of total farmers in sample</u>	<u>Cummulative Percentage</u>
0	6	12	12
1	0	0	12
2	0	0	12
3	2	4	16
4	3	6	22
5	5	10	32
6	4	8	40
7	7	14	54
8	13	26	80
9	6	12	92
10	3	6	98
11	1	2	100
12	0	0	100
Total	50	100%	-

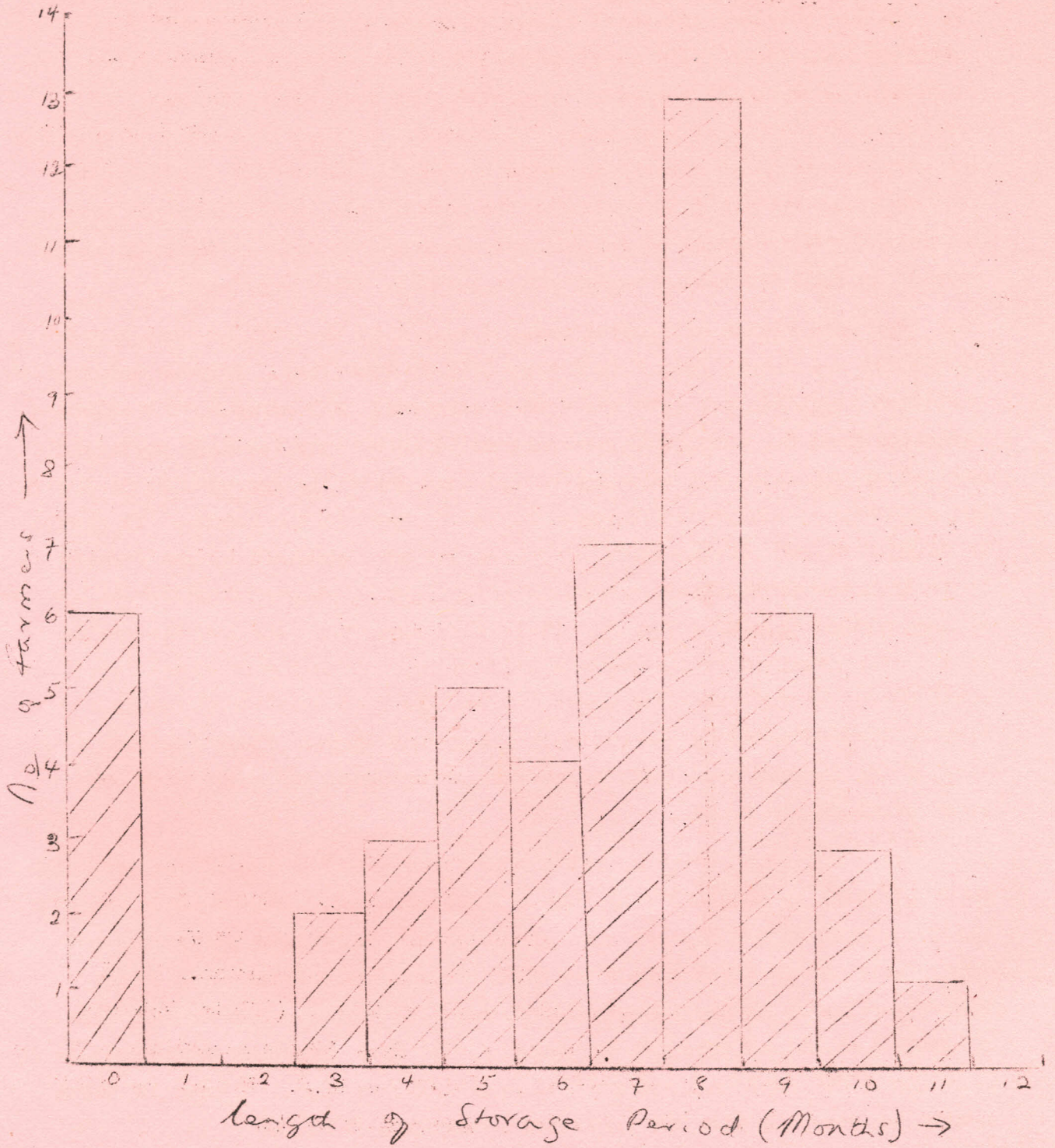
18. The farmers stored their maize for up to a modal period of 8 months (See Table 2 & Diagram 1) while the mean (arithmetic) storage period was estimated to be 6.3 months. Standard deviation was 2.9 months and percentage variation was 46. Harvesting was largely all accomplished in August and early September. This implies that from the end of April, most of the available maize on the market was held by the middlemen and not by the farmers. However after eleven months from harvest all the farmers had exhausted their stock of marketable surpluses. Sales of stored maize generally commenced from the third month after harvest, increasing steadily to a peak in the eighth month which coincided with May. This is shown by Diagram 1. After that month (May) only 10 (20%) of the farmers still had some maize in storage. The largest volume of sales were made from the seventh to the ninth month inclusive - that is April, May and June. It must be noted that maize prices are usually highest in this country during these months (10, p.29).

The following were the reasons found to prompt farmers to release their maize from storage for sales: the availability of buyers, attractive prices, financial extigencies and extent and rate of deterioration of the product in storage.

Diagram 1

-11-

Distribution of the lengths of maize storage period by No. of Farmers.



D. MAIZE OUTPUT AND MARKETED SURPLUS

Yields and Total Output

19. Yields obtained and total output of maize by the 50 farmers studied were estimated from total sales made; household consumption, losses incurred. The quantities of maize harvested in the fresh form were also estimated and converted into dried shelled maize equivalent. It must be mentioned that for the purposes of these estimates, total household consumption was taken to include maize set aside as seeds for the next season, gifts (dashes) made of the maize by the farmers to friends and relatives as well as those given as payment in kind for labour and/or other services where applicable.

20. Per acre yields of shelled maize obtained by the farmers averaged 3 bags or 690 lbs and ranged from 1 to 8 bags (230 to 1840 lbs). Between the farmers, variation in yields per acre was rather marginal. For example, the standard deviation from the mean yield was calculated to be only 1.7 bags while the percentage variation was only 3 (see Appendix Table 3). Appendix Table 3 gives the analysis of the yields obtained by the farmers in the sample. It should be noted that the average yield of 3 bags per acre obtained by the farmers was lower than the national average yield of 4.3 and 4.8 bags quoted by the Ministry of Agriculture (4,p.42 & 7,p.9). It is also lower than the average yields on 4.5 bags obtained by the farmers used in the estimation of maize cultivation costs in the survey area (see pages 6 & 7). In fact only 19 of the 50 farmers studied obtained the yield of 3 bags and above. These indicate that most of the farmers especially those who interplanted the maize with other crops obtained low yields.

21. Total output of maize by all the 50 farmers in the sample was estimated to be 458 bags or about 47 long tons of shelled maize. This could be considered low on account of the low per acre yields obtained. Unlike the yields per acre, variation in total output per farmer was quite substantial. Total output per farmer in the sample ranged from 1 to 38 bags (230 to 8740 lbs) of shelled maize and averaged 9.0 bags or 2070 lbs. Standard deviation was to be 8 bags (1840 lbs) while percentage variation was 15.8. Figures of total output and analysis made are presented in Appendix Table 4.

Storage Losses and Household Consumption

22. Storage losses here denotes that fraction of total output which the farmer was unable to sell or consume as a result of physical damage by insects, rodents and other animals and losses incurred through pilfering and other causes from harvest to the time of sale. Farmers were asked on each fortnightly visit to indicate such losses as percentage of sales made thus far. Analysis of figures thus compiled gave the following results. Total storage losses averaged as high as 12 percent of total output per farmer with standard deviation of 9 percent while percentage variation was 18. The high percentage losses may be attributable to the fact that majority of the farmers did not treat their maize. The range of percentage losses was however from 0 to 44. Attempts were also made to relate percentage losses to the length of storage period. Table 3 gives the lengths of storage period, number of farmers who stored up to those periods and total average percentage losses encountered.

Table 3 Storage Period vs. Percentage Storage Losses

Storage Period	No. of Farmers	% Losses
0	6	21
1	0	-
2	0	-
3	2	18
4	3	26
5	5	13
6	4	6
7	7	9
8	13	9
9	6	8
10	3	8
11	1	16
Total	50	-

There was no relationship between the extent of storage losses and the length of storage period. For example the 6 farmers who sold their maize immediately after harvest encountered an average of 21 percent losses. This apparently represents theft and physical damage to the maize before and during harvesting and pre-harvest infestation by insects (11). Three farmers who stored their maize for up to 4 months encountered the greatest percentage losses of 26 while those who stored for up to 6 months got the least percentage losses of 6. Perhaps treatment of the product during storage was the most important single factor.

Household Use

23. Records of the use of maize by the household were taken to enable the estimation of total marketed surplus. Household use of the crop is taken here to comprise actual consumption, dashes (gifts) made of the product to members of other households and the part of the total produce set aside to be used as seeds for the next season. Figures obtained were expressed as percentage of total output/are presented and analysed in Appendix Table 5. It was estimated that on the average a household use amounted to over a third or 36 percent of its total output of maize (see Appendix Table 5). There was however a very wide variation in the percentage of output by the farmer that was used by the household. For example percentage variation was estimated to be 50 while the standard deviation from the mean of 36 percent was 22. The household use of 36 percent of the total output could be said to be very high if it is considered that the remaining output could feed even less than two similar households assuming even no storage and other losses. This indicates further that the output of maize by the farmers was generally low.

Total Marketed Surplus

24. In an open economy, an estimate of total marketed surplus of a product is more important than an estimate of the gross aggregate output. The marketed surplus gives a better picture of the effective supply position of the commodity and provides a good basis for estimating producers' cash incomes.

In this study, farmers marketed maize surpluses were obtained from all their total sales records obtained during the fortnightly visits. The sales figures were then compared with the figures for yields, household use and the losses incurred. Appendix Table 7 gives the total output of maize and the marketed surpluses by all the 50 farmers studied in the sample. Total output by the 50 farmers has been estimated to be 458 bags or 47 long tons of shelled maize. Fifty-two percent or 238 (24.4 long tons) of this became the total marketed surplus. In other words only 52 percent of the total output by the farmers entered the open market. The rest went into household use including actual consumption, dashes, seeds and losses. Total sales made per farmer ranged from 0 to 32 bags and averaged 5.7 bags. There was however a very wide percentage variation of 71 among the farmers with respect to the total marketed surplus produced. The wide variation in marketed surplus may be explained largely by variation in household use and percentage losses incurred by the farmers. In terms of acres it was estimated that an average of only 1 bag out of the mean yield of 3 bags per acre was marketed with the standard deviation of 0.9 of a bag per acre.

E. MARKETING AND DISTRIBUTION

25. This section of the report outlines the marketing outlets available for the maize produced in the survey area. It also describes briefly the types of buyers and their relationship with the farmers. Attempt is also made to trace the movement and distribution of maize produced in the area. The section then ends with a brief discussion on the prices obtained and the incomes derived from maize during the season.

Places of Sales and Types of Buyers

26. It is held by many people that farmers are usually too pre-occupied with primary production activities to get involved in the effective marketing of their products. In the absence of marketing co-operatives therefore, farmers usually leave the marketing task to be performed by their wives and middlemen.

This state of affairs, it is held is often responsible for the low proportion of the price paid by the consumer which goes to the farmer. It was found in the survey area that most of the farmers did not go outside their villages to explore and exploit available marketing opportunities. They seemed to prefer to wait in their villages for buyers. Thirty-seven or 74 percent of the farmers studied sold all their maize in their villages of residence and mostly to itinerant buyers (or middlemen). Ten (or 20%) of the farmers sold all their maize outside their villages while only two (4%) sold both outside and within their villages. It must be mentioned that the sale of the maize outside the villages of production was done largely by the farmers' wives and not the farmers themselves.

27. Itinerant dealers mostly women were responsible for the purchases of virtually all the maize produced by the farmers in the sample. Itinerant dealers here describes those traders who moved from one village to another to buy maize to resell in the urban or intermediate markets for profit. Unlike those operating in other areas e.g. North Ashanti (9) the itinerant dealers in the survey area did not have any standing arrangements with the farmers. The latter could therefore choose between the buyers. All the farmers in the sample sold their maize for spot cash. Forty-two or 84% of the farmers studied sold all their maize to itinerant dealers, three (6%) sold to both itinerant dealers as well as the Grain Development Board while the remaining 2 (4%) sold directly to kenkey producers. This meant that the itinerant dealers, the Grain Development Board and kenkey producers provided the most immediate market for the farmers' maize. Of the three, however, the itinerant dealers were the most important. They purchased 221 bags or 93 percent of the maize offered for sale by the farmers in the sample. The Grain Development Board bought only 5.6 percent of the total marketed surplus while only 1.4 percent was sold by the farmers directly to kenkey producers. It should be mentioned that none of the farmers in the sample conducted any business with the Food Distribution Corporation. Apparently the latter did not operate in the survey area.

28. Attempts were made during the survey to trace the movement and distribution of maize produced in the survey area. Efforts made in this direction included the questioning of farmers and their wives about the operations of their customers and visits to all the markets - both periodic and permanent within and around the survey area to talk to maize dealers. It must be admitted that it was not possible to trace the final destination or points of consumption of all the maize produced by the farmers studied. However information obtained gave some indications about the general pattern of the movement of maize produced in the survey area.

29. It has been mentioned above that 37 out of the fifty farmers studied sold all their maize in their villages. These villages therefore afforded the collecting points for the itinerant dealers who in other words performed the task of 'local assemblers'. Mention has also been made of the fact that some other farmers sold part or all of their maize outside their own villages. These farmers totalling twelve in number sold on six markets. The names of the markets and the number of farmers who sold on them are given in Table 6.

Table 6

Outside Markets Used by Maize Farmers

Name of Market	No. of Farmers Using Them
Kasua	4
Swedru	3
Ankamu	2
Dawurampong	1
Winneba	1
Mankesim	1

30. While Dawuramong and Ankamu could be described as "Local assembly markets" within the survey area, Winneba and Swedru could be regarded as 'terminal markets' having regard to their large population and occupational structure. For instance, according to the 1970 census reports, out of the population of 16,073 aged 15 years and above in Winneba only 2,411¹ or 15.0 percent were engaged in Agriculture (2). The same report indicated that at Swedru only 1,230 or 10.9 percent of the population were engaged in Agriculture. Unlike Winneba and Swedru, Kasua is a very tiny village which has become an important market place with the market operating on Tuesdays and Fridays. The single major factor which has made the Kasua market important in terms of patronage and volume of foodstuffs 'exchanged' is its central location between and accessibility from the food producing areas of Gomoa and Bawjiase and the large market of Accra-Tema.

31. It was only possible to obtain information from 22 maize dealers who bought maize from some of the farmers studied and/or operated in the survey area. Table 7 gives the markets on which these dealers finally sold their maize and the number of them who used these markets. It must be noted that most of the dealers sold their maize on one market only. The reason for this might be that they had fixed arrangements or facilities for disposing of their wares on the individual markets.

Table 7 Selling Points for Itinerant Dealers

<u>Market</u>	<u>No. of Dealers</u>
Apam	7
Cape Coast	3
Winneba	3
Kasua	3
Swedru	2
Accra	2
Mankessim	1
Kasua & Bawjiase	1
Total	<u>22</u>

¹ Almost all would be engaged in fishing activities.

32. The volume of maize moved onto the above markets by dealers relative to the total marketed surplus produced in the survey area could not be assessed. In the absence of such data, it has been assumed that the data given by Table 6 and 7 together would provide a picture of how maize produced in the survey area was distributed among the various markets. Table 8 therefore sums up data given in Tables 6 and 7.

Table 8 Distribution of Maize by No. of Traders and Farmers

Market	No. of Maize Traders	No. of Farmers	Total
Apam	7	0	7
Cape Coast	3	0	3
Winneba	3	1	4
Kasua	3	4	7
Swedru	2	3	5
Accra	2	0	2
Mankesim	1	0	1
Ankamu	0	2	2
Dawurampong	0	1	1
Kasua & Bawjiase	1	0	1

It gives the various markets used by the farmers who sold their maize outside their own villages as well as the markets on which the 22 maize dealers encountered sold the maize they bought from the survey area. The table suggests that a considerable proportion of the maize produced in the survey area goes to Apam, Swedru and Winneba. However if it is considered that Kasua serves the Accra market - that is, it is an intermediary market between Gomoa and Accra - then it could be said that Accra receives the largest proportion of the maize produced in the survey area, and that the large volumes of maize reaching Accra from the survey area pass through Kasua. The table also indicates that Cape Coast depends to some extent upon maize produced in the survey area.

Prices Obtained by Farmers

32. It is common knowledge that prices of foodstuffs reach their down troughs during the harvesting seasons. Farmers who are therefore forced to sell their produce at the time of harvest usually obtain lower prices than those who store or postpone sales. It is possible however in some exceptional cases for a price received by a farmer at harvesting time to be higher than the post-harvest prices. Such a situation could arise, for example, where prices are fixed or agreed upon by both the farmer and the buyer before the crop is even harvested - i.e. in 'forward sales'. The place of sales has also got a bearing on the price. For example, within limitations, people would like to sell where they are likely to obtain the best prices for their commodities - where there is excess demand over supply.

33. It has been stated earlier that most of the farmers in the sample stored their maize for various periods before sales and that some of them sold their products outside their villages. The prices received by the farmers would therefore be expected to vary considerably. They actually varied from as low as ₦6.00 to as high as ₦28.00 per bag of shelled maize. The average price received was ₦18.80 while the percentage variation was as high as 90 (see Appendix Table 8). It must be noted that the lowest price of ₦6.00 was obtained during the peak of the harvesting season and that it was lower than the then operating minimum guaranteed price of ₦10.00 per bag of 220 lbs. Some interesting results were obtained when the average price obtained was related to the length of the storage period for the maize (i.e. the number of months the maize was stored before sales). Table 9 gives the number of months the maize was stored and the average price for which it was sold while Diagram II gives the relationship between the storage periods and average prices.

Table 9 Prices of Maize After Various Storage Periods

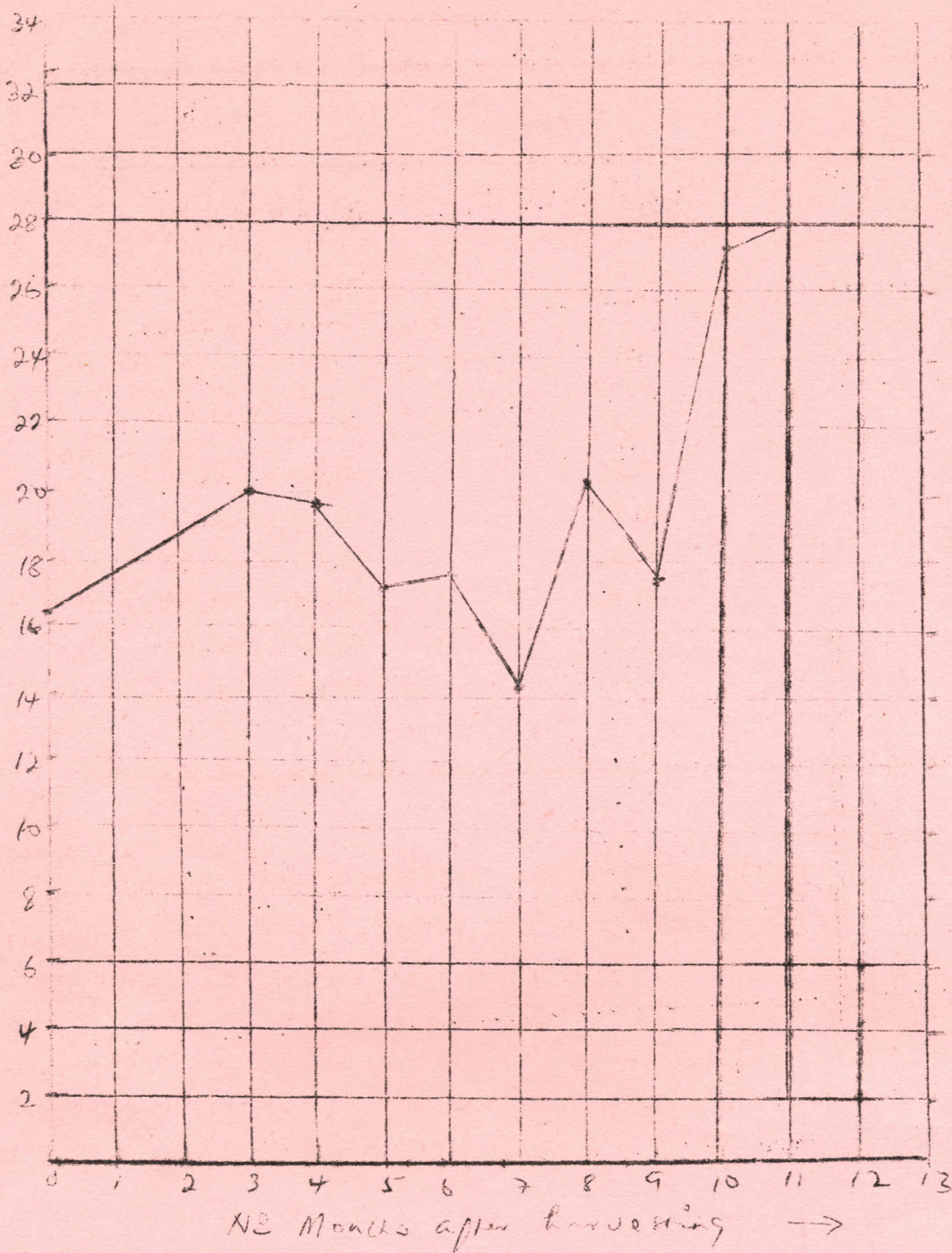
No. of Months After Harvest	Average Price/Bag	Price Range
0	₱16.33	₱6.00 - ₱20.00
1	-	- -
2	-	- -
3	20.00	-
4	19.69	16.00 - 20.70
5	16.98	15.00 - 21.00
6	17.50	16.00 - 20.00
7	14.10	15.50 - 22.00
8	20.36	14.00 - 26.60
9	17.70	15.00 - 25.00
10	27.78	27.60 - 28.00
11	28.00	28.00 -

Diagram II shows that contrary to expectation the price of maize received by the farmers did not actually increase progressively with the length of storage.

DIAGRAM II

Price / bag of Maize after Various Months of Storage

↑
Average
Price
per bag
of Maize
-φ-



In fact it shows that the average price per bag of maize dropped from ₦20.00 in the third month to ₦14.10 in the seventh month of storage - a drop of about 30%. This means that the farmers who sold their maize between the third and the seventh month received lower average prices than those who sold their maize earlier. Both Table 9 and Diagram II show that the highest prices were received by the farmers who stored the maize for the maximum periods of ten and eleven months. Unfortunately, however only 8 percent (4) of the farmers studied in the sample were able to take advantage of these high prices (see Table 2). It should be noted from Diagram II however, that the general level of maize prices was higher throughout the post-harvest (storage) period than during the harvesting time - a fact which seemed to make maize storage by the farmers a sensible venture.

Incomes Derived from Maize

34. Farming was the full-time occupation of all the people studied in the sample and maize constituted their principal cash crop. The cassava and vegetables produced were largely for subsistence purposes although most farmers usually obtained surpluses especially of the cassava, for the market. Gross earnings from the major season sales ranged widely from ₦6.00 to ₦495.00 and averaged ₦114.63 per farmer in the sample (see Appendix Table 10). The above figures do not include the value of the maize used by the household. It has been estimated earlier (pp.14 & 15) that a household consumed an average of 36 percent and sold 52 percent of its total output. Assuming that the 52 percent of total output sold fetched the farmer an average sum of ₦114.63 then his total output - less the losses incurred would fetch an average of ₦194.00. Assuming further, an average acreage of 5 per farmer (see Appendix Table 9) and the estimated total production cost of ₦41.00 per acre (see p.7, Table 1) then it can be concluded that the average farmer in the sample obtained just enough money to pay himself.

In other words, he obtained just enough money to cover his production costs after satisfying his household needs for the produce. This situation shows an essential departure from subsistence production.

F. CONCLUSION

35. Although the Gomoa area is claimed to be one of the largest maize producing areas in Ghana, the evidence is that maize production in the area is plagued by low yields, low per capita output and in fact low total output. Should similar conditions obtain in the other major producing areas then the situation of high maize prices in the country could be ascribed at least partially to low total output. In view of the enormous potential in the area it is suggested that the Ministry of Agriculture intensify its extension services in the area. The Ministry could work in concert with the Agricultural Development Bank in this direction.

36. It was evident that it was more profitable to use improved seeds and fertilizers in the cultivation of maize in the area yet most farmers used neither of these inputs. To increase maize production in the area, the reasons for the situation must be ascertained the proper remedy applied.

37. The market outlets available to the farmers in the area do not auger well for increased production. In the absence of any effective alternative there was evidence of heavy reliance by farmers on small scale private itinerant dealers who dictated the prices to the farmers. This tended to narrow the farmers' opportunities to obtain remunerative prices. It is suggested that the Food Distribution Corporation and the Grains Development Board establish buying depots in the area and send buying teams to the area especially from April to June to offer alternative marketing outlets to the farmers. It is believed that the competition generated by such efforts could enable farmers to get better prices and thus encouraged them to augment their outputs.

38. In view of the high storage losses incurred by the farmers and the preponderance of farmers who did not treat maize doing storages over those who did, the Ministry of Agriculture could consider embarking upon a storage campaign to educate the farmers to treat their stored maize.

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APPENDIX TABLE I

GHANA AREA OF MAIZE - MAIN SEASON 1970
BY DISTRICT*

Agricultural District	Pure	Area Under Maize (Acres)		Total
		Mixed - Maize Predominant	Mixed - Maize Subsidiary	
Takoradi	1,000	13,000	9,000	23,000
Tarkwa	1,000	7,000	3,000	11,000
Cape Coast	1,000	20,000	11,000	32,000
Swedru	27,000	17,000	2,000	46,000
Esiam	1,000	9,000	2,000	12,000
Asamankese, Kibi, Tafo	3,000	21,000	5,000	29,000
Koforidua	1,000	6,000	1,000	8,000
Akosombo, Somanya	14,000	26,000	1,000	41,000
Greater Accra	16,000	36,000	1,000	53,000
Ho, Sogakope	9,000	6,000	5,000	20,000
Denu	12,000	29,000	1,000	42,000
Western Kumasi	6,000	24,000	8,000	38,000
Eastern Kumasi	1,000	18,000	5,000	24,000
Mampong	2,000	15,000	2,000	19,000
Bekwai	-	15,000	9,000	24,000
Kumasi City	7,000	4,000	-	11,000
Goaso, Sunyani	11,000	26,000	6,000	43,000
Yendi	-	17,000	12,000	29,000
Tamale	2,000	30,000	6,000	38,000
Navrongo, Bolgatanga	-	-	-	-
Bawku	-	-	-	-
Total Ghana	146,000	568,000	186,000	900,000

* Culled from Ghana Sample Census of Agriculture 1970
Vol.1 (p.82).

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APPENDIX TABLE 2*

ACRES OF MAIZE PRODUCED BY TYPE OF HOLDING 1966-68

Year	Type of Holding			
	Small Scale	Co-operative	Large Scale/ Specialized	Total Ghana
1966	764,000	1,317	19,620	785,000
1967	709,000	319	18,952	728,00
1968	655,000	180	15,649	671,000

*Source: Current Agricultural Statistics 1966-68 pp.31-33
Economics & Marketing Division - Ministry of Agriculture.

APPENDIX TABLE 3

MAIZE YIELDS PER ACRE (BAG OF 230 LBS.)

1.	5	26.	1
2.	4	27.	2
3.	3	28.	1
4.	4	29.	3
5.	8	30.	1
6.	2	31.	1
7.	2	32.	2
8.	3	33.	4
9.	4	34.	1
10.	2	35.	2
11.	5	36.	5
12.	1	37.	4
13.	5	38.	5
14.	2	39.	1
15.	5	40.	1
16.	4	41.	2
17.	1	42.	2
18.	5	43.	2
19.	1	44.	2
20.	3	45.	1
21.	1	46.	1
22.	1	47.	2
23.	2	48.	1
24.	4	49.	1
25.	1	50.	1

$$\bar{X} = 3$$

$$s^2 = 2.90$$

$$s = 1.70$$

$$\text{Coefficient of variation} = 0.034$$

$$\text{Percentage variation} = 3.4$$

APPENDIX TABLE 4

TOTAL OUTPUT OF MAIZE PER FARMER (BAGS OF 230LBS.)

1.	5	26.	6
2.	4	27.	5
3.	3	28.	11
4.	4	29.	8
5.	8	30.	7
6.	5	31.	9
7.	6	32.	8
8.	23	33.	9
9.	20	34.	8
10.	2	35.	4
11.	2	36.	4
12.	1	37.	14
13.	5	38.	13
14.	7	39.	17
15.	4	40.	3
16.	27	41.	4
17.	20	42.	5
18.	23	43.	2
19.	9	44.	17
20.	8	45.	4
21.	20	46.	21
22.	38	47.	6
23.	4	48.	4
24.	3	49.	5
25.	18	50.	1

$$\bar{X} = 9$$

$$\sigma^2 = 61.24$$

$$\sigma = 7.82$$

$$\text{Coefficient of variation} = .156$$

$$\text{Percentage variation} = 15.6\%$$

APPENDIX TABLE 5

HOUSEHOLD CONSUMPTION AS PERCENTAGE
OF TOTAL OUTPUT*

1.	11	23.	40
2.	25	24.	78
3.	27	25.	19
4.	63	26.	45
5.	68	27.	37
6.	31	28.	41
7.	25	29.	38
8.	31	30.	15
9.	45	31.	37
10.	90	32.	29
11.	57	33.	34
12.	43	34.	52
13.	38	35.	1
14.	81	36.	15
15.	71	37.	1
16.	35	38.	27
17.	54	39.	19
18.	7	40.	12
19.	38	41.	15
20.	58	42.	1
21.	23	43.	29
22.	11	44.*	67

$$\bar{X} = 36$$

$$\sum = 486$$

$$\sigma = 22.04$$

$$\text{Coefficient of variation} = 0.50$$

$$\text{Percentage variation} = 50\%$$

*No meaningful results were obtained from 6 of the farmers.

APPENDIX TABLE 6

LOSSES AS PERCENTAGE OF TOTAL OUTPUT

1.	44	26.	11
2.	25	27.	23
3.	27	28.	19
4.	13	29.	8
5.	7	30.	11
6.	7	31.	19
7.	16	32.	20
8.	4	33.	3
9.	10	34.	1
10.	21	35.	2
11.	15	36.	21
12.	24	37.	5
13.	19	38.	6
14.	29	39.	3
15.	12	40.	14
16.	10	41.	14
17.	6	42.	0
18.	8	43.	8
19.	6	44.	14
20.	15	45.	2
21.	5	46.	5
22.	7	47.	14
23.	22	48.	3
24.	5	49.	0
25.	27	50.	8

$$\bar{x} = 12$$

$$\sigma^2 = 81.8$$

$$\sigma = 9.04$$

$$\text{Coefficient of variation} = .1808$$

$$\text{Percentage variation} = 18.0\%$$

APPENDIX TABLE 7

TOTAL MAIZE OUTPUT & MARKETED SURPLUS PER FARMER

	Total Output (Bags)	Total Sales (Bags)	Percent of Total Output		Total Output (Bags)	Total Sales (Bags)	Percent of Total Output
1.	5.0	2.0	40	24.	18.0	14.0	78
2.	4.0	2.0	50	25.	6.0	1.5	25
3.	3.0	1.2	40	26.	5.0	2.5	50
4.	4.0	1.0	25	27.	11.0	4.0	36
5.	8.0	2.0	16	28.	8.0	3.5	44
6.	5.0	3.0	60	29.	7.0	5.0	71
7.	6.0	4.0	68	30.	9.0	4.5	50
8.	23.0	12.0	52	31.	8.0	4.0	50
9.	20.0	10.0	50	32.	9.0	4.0	44
10.	2.0	0.0	0	33.	8.0	3.5	44
11.	2.0	0.5	25	34.	4.0	3.5	88
12.	1.0	0.5	50	35.	14.0	9.0	62
13.	5.0	1.8	36	36.	17.0	11.5	68
14.	4.0	0.0	0	37.	3.0	2.0	67
15.	27.0	14.5	54	38.	4.0	3.0	75
16.	20.0	7.0	35	39.	5.0	4.5	90
17.	23.0	20.0	87	40.	17.0	12.8	75
18.	9.0	5.0	56	41.	4.0	3.0	75
19.	8.0	3.0	37	42.	21.0	20.0	95
20.	20.0	12.5	59	43.	4.0	3.0	75
21.	38.0	32.0	84	44.	5.0	3.5	70
22.	4.0	0.0	0	45.	1.0	0.3	33
23.	3.0	2.0	67				

Average percentage of Total Output Sold (Marketed)
by farmer = 52.3.

APPENDIX TABLE 8

AVERAGE PRICE PER BAG OF MAIZE
RECEIVED BY FARMERS

1.	₱20.00	26.	₱18.00
2.	18.00	27.	18.00
3.	20.70	28.	19.00
4.	18.40	29.	16.00
5.	15.00	30.	15.10
6.	20.00	31.	15.10
7.	20.00	32.	20.00
8.	28.00	33.	10.00
9.	28.00	34.	15.60
10.	16.00	35.	16.20
11.	16.00	36.	20.70
12.	6.00	37.	20.00
13.	21.00	38.	15.00
14.	16.90	39.	26.00
15.	22.00	40.	24.00
16.	22.00	41.	19.60
17.	18.00	42.	24.00
18.	16.00	43.	25.00
19.	14.00	44.	19.00
20.	15.50	45.	16.00
21.	16.00	46.	15.00
22.	28.00	47.	18.00
23.	20.00	48.	27.40
24.	16.00	49.	22.00
25.	16.00		

$$\bar{X} = \text{₱}18.80$$

$$\sigma = \text{₱}19.65$$

$$\sigma = \text{₱}4.43$$

$$\text{Coefficient of variation} = 0.90$$

$$\text{Percentage variation.} = 90$$

APPENDIX TABLE 9

SIZES OF MAIZE HOLDING OF FARMERS
IN THE SAMPLE - (ACRES)

1.	1	26.	4
2.	1	27.	6
3.	1	28.	6
4.	1	29.	8
5.	1	30.	2
6.	2	31.	18
7.	4	32.	8
8.	$7\frac{1}{2}$	33.	4
9.	5	34.	2
10.	1	35.	3
11.	$\frac{1}{2}$	36.	2
12.	1	37.	3
13.	1	38.	3
14.	5	39.	$3\frac{1}{2}$
15.	$1\frac{1}{2}$	40.	3
16.	6	41.	4
17.	5	42.	$3\frac{1}{2}$
18.	18	43.	1
19.	2	44.	8
20.	6	45.	$1\frac{1}{2}$
21.	6	46.	20
22.	30	47.	8
23.	8	48.	2
24.	$1\frac{1}{3}$	49.	4
25.	$4\frac{1}{4}$	50.	$\frac{1}{2}$

$$\begin{aligned} \bar{X} &= 5.0 \\ \sigma^2 &= 30.8 \\ \sigma &= 5.58 \end{aligned}$$

$$\begin{aligned} \text{Coefficient of variation} &= 0.11 \\ \text{Percentage variation} &= 11 \end{aligned}$$

APPENDIX TABLE 10

INCOMES DERIVED FROM THE SALES OF MAIZE

1.	ø40.00	26.	ø90.00
2.	36.00	27.	86.00
3.	26.50	28.	64.00
4.	21.20	29.	60.00
5.	30.00	30.	112.00
6.	60.00	31.	50.00
7.	80.00	32.	40.00
8.	340.00	33.	40.00
9.	280.00	34.	140.00
10.	8.00	35.	210.00
11.	12.00	36.	238.00
12.	42.00	37.	40.00
13.	245.00	38.	45.00
14.	154.00	39.	120.00
15.	436.00	40.	48.00
16.	90.00	41.	249.00
17.	48.00	42.	82.00
18.	175.00	43.	480.00
19.	495.00	44.	66.00
20.	32.00	45.	150.00
21.	392.00	46.	23.00
22.	30.00	47.	48.00
23.	40.00	48.	90.00
24.	64.00	49.	6.00
25.	63.00		

$$\begin{aligned}\bar{X} &= \text{ø}114.63 \\ \sigma^2 &= \text{ø}13724.43 \\ \sigma &= \text{ø}117.14\end{aligned}$$

$$\begin{aligned}\text{Coefficient of variation} &= 23.91 \\ \text{Percentage variation} &= 2391\end{aligned}$$