Chapter I
INTRODUCTION

GEOGRAPHY

1.01 The islands of Samoa in the Central South Pacific lie between latitude 13 degrees and 15 degrees south and longitude 168 degrees and 173 west, close to the international dateline. The Samoa group is located 2,600 miles Southeast of Hawaii, 1800 miles from New Zealand and 2700 miles from Sydney, Australia. The nearest neighbor is American Samoa, the capital Pago-Pago being only 80 miles away. The Independent State of Samoa consists of two main islands, Savaii and Upolu, with eight smaller islands Apolima, Manono, Fanuatapu, Namua, Nu'utele, Nu'ulua, Nu'ulopa, and Nu'usafe'e. The total land area is 1,100 sq. miles (2,830 sq. km.). Savaii is the largest island (660 sq. miles or 1,700 sq. km.). The second largest island is Upolu (430. Sq. miles or 1,100 sq. km.) where the capital Apia is located with a population of 34000 in the 1991 Census. In the same year the population of Samoa totaled 161000 persons, a population which includes the largest concentration of full blooded Polynesians in the world. The islands are of volcanic origin clearly visible in the form of several dormant volcanoes and lava fields. Beyond the narrow coastal plains, the mountain ranges rise steeply to a maximum of 6,095 feet (1,859 meters) on Savaii and 3,608 feet (1,100 meters) on Upolu intersected by fertile valleys. Lush vegetation and rain forest cover the greater part of the country.

1.02 The country, which consists of about 330 villages for administrative purposes, is divided into 41 districts. These districts are further grouped into four census regions namely Apia Urban Area, North-West Upolu, Rest of Upolu and Savaii. For census purposes, a village is divided into census blocks. There are in all 863 census blocks.

CLIMATE

1.03 The climate of Samoa is tropical with abundant rainfall. Humidity averages 80 Percent. The average monthly temperature ranges from 22^0 C to 30^0C with very little seasonal variation. There are two major distinguishable seasons. The wet season extends from November through April, the dry season from May to October during which period the climate is pleasant because of fresh trade winds. The annual rainfall averages 2,880mm, although there is great variation with latitude and location. The north west receives less than the south east. In 1990 and 1991 two strong Cyclones struck the country damaging houses and plantations and seriously affected the economy.

Chapter III
BACKGROUND, SCOPE AND METHODOLOGY

3.01 Agriculture and fisheries are the backbone of the village economy in Samoa. Although about 80% of the population is engaged in some form of agricultural activity, the contribution of agriculture to G.D.P has stagnated over years. Two cyclones one in January 1990 (OFA) and one in December 1991 (VAL) caused extensive damage to crops there was also onset of taro leaf blight in 1993.

3.02 The challenge is therefore to revive agriculture through initiatives to redevelop traditional crops as well as encouraging diversification. Efforts are also required for the development of fisheries.

3.03 To plan for the development of the agriculture sector there is an urgent need for accurate and updated information. The government of Samoa therefore decided to conduct a second Census of Agriculture, to make an inventory of the agriculture resources of the country.

3.04 In order to prepare for the Census of Agriculture, the government of Samoa in addition to providing budgetary resources from their own funds, sought assistance from the Food and Agriculture Organization of the United Nations under F.A.O. Technical Cooperation Programme (TCP/SAM/8921).

3.05 The Census activities under the TCP project during the eighteen months can roughly be divided into three stages.

(a) May to September 1999

This included the formation of Census Advisory Committee, acquisition of equipment and materials, preparation of census frames and enumeration maps development of census work plan, design of census questionnaires, conduct of data users and producers workshop, pretest of census questionnaires, start of census publicity, finalization of questionnaires and manuals, recruitment of enumerators and supervisors, training of supervisors and designing of data processing system.

During this period International (Lead) consultant in Agriculture Statistics (17th July to 13th August 1999) TCDC Expert in Agricultural Census Planning, Training and Field operations (11th July to 15th August 1999) and TCDC expert in Agriculture Census/Survey Processing (11th August to 6th) September 1999 under took their

missions and assisted the department of Statistics in the above aspects of work.

(b) October to April 1999

Training of enumerators, organization of field work, census enumeration, field checking of the questionnaires by supervisors, collection of census materials from the field, editing and coding, data entry, manual tabulation of livestock data, training and conduct of the post-enumeration check and release of preliminary results on livestock numbers was done.

The highlights of the activities under taken during this period were

(i) Successful completion of the field work.

(ii) Release of preliminary results.

During this period, TDC expert in Agricultural Census Planning, Training and Field operations (3rd November to 17th December 1999), Senior Officer Statistics Division F.A.O Rome (7-12 November 1999 and 5-25 March 2000 undertook their missions and assisted the Department of Statistics in the above activities.

(c) April to August 2000

During this period, activities were done related to processing of data and post-enumeration results, tabulation of data, preparation of census data base, analysis and write up of census reports and their distribution and seminar on dissemination of census results.

The TCDC Experts in Agriculture Census/Survey Processing (14th May to 14th June 2000), TCDC Expert in Agriculture Census Planning, Training and Field operations (May 21st - 30th June 2000) and International (Lead) consultant in Agriculture Statistics (7June – 6th July 2000) undertook their missions and assisted their counterparts in completing their tasks.

3.06 The main achievement of the project has been to complete the work ahead of time and bring out the results within 8 months of completion of the field work.

Official Arrangements

3.07 The project document was signed towards the end of April 1999 and the project become operational in May 1999. The project was scheduled to last for 18 months with F.A.O. input of US$244,000 and Samoa contribution of ST of 249,000 F.A.O was designated as the Executing Agency and the Department of Statistics. Government of Samoa as the counter part agency responsible for project implementation.

Authority for the Agriculture Census

3.08 The Department of Statistics as a joint exercise with the Ministry of Agriculture conducted the Agriculture Census. Authority for the Census rested with the Government Statistician, who had the legal power to collect such information under Statistics Act 1971. The act provides for total confidentiality of the information collected in the census. The information can only be used for the purpose of compiling statistics and no individual information can be disclosed to any one outside the census organization.

Scope of Agriculture Census

3.09 The following table gives the scope of Censuses of Agriculture 1989 and 1999. In the 1999 Census, the scope has been expanded to cover additional crops for the sale and consumption. Additional data on livestock and details on improved varieties of crops were also included. In view of the growing importance of fisheries many more questions were asked. The table below gives the details.

Table 3.1 Items Covered for Censuses of Agriculture in 1989 AND 1999

ITEM No.	DATA ITEMS	1989	1999
Household Form			
1	Level of Agriculture Activity of the Households	✓	✓
2	Number of Holdings and Method of Operation	✓	✓
3	Total Area of the Holding	✓	✓
4	Crops Grown (two crops namely taro palagi and teuila were included and five crops, namely, sugarcane, celery, passionfruit, guava and nonu were deleted)	35 crops	32 crops
5	Sale of Major Crops (additional crops included are banana, taro, taro palagi and taamu. Coconut was subdivided into young coconut and matured coconut.)	3 major crops	8 major crops

6	Consumption of Major Crops (additional crops included are banana, taro, taro palagi and taamu. Coconut was subdivided into young and matured coconut.)	3 major crops	8 major crops
7	Livestock (additional data on number slaughtered and number of live animals sold was collected.)	1 data item	3 data items
8	Amenities at the Principal Homestead	✓	✓
9	Household Composition	✓	✓
10	Labour Inputs	✓	✓

Table 3.1 Items Covered for Censuses of Agriculture in 1989 AND 1999 (continued)

ITEM No.	DATA ITEMS	1989	1999
11	Household Agricultural Income and Credits	✓	✓
12	Use of Fertilizers, Agricultural Chemicals and Improved Varieties (this section has been expanded to get more details on improved varieties of crops)	3 data items	4 data items
13	Fisheries (this contains more information in view of growing importance of fisheries in the country)	3 data items	7 data items
14	Agriculture Equipment (one item “paopao” was deleted and two items motorized boat and non-motorized boats were included.)	13 items	14 items
15	Forestry	x	✓
Parcel Form			
16	Plot Details (giving the area and other crops method of sowing, etc.)	✓	✓
17	Crops Planted and Harvested	✓	✓

Census Advisory Committee

3.10 For the successful implementation of the Census programme, a census Advisory Committee was formed with the representatives from the following departments.

1.	Government Statistician	Chairperson
2.	Representative	Ministry of Foreign Affairs
3.	Director of Agriculture	Ministry of Agriculture
4.	Representative	Ministry of Internal Affairs
5	Representative	Ministry of Finance

6	Representative	Ministry of Women Affairs
7	Representative	FAO Sub Regional Office

This Committee met frequently and approved the workplan, scope and coverage of census methodology, questionnaires and manuals. The committee also reviewed the progress of work from time to time.

Census Methodology

3.11 The methodology for carrying out the census of Agriculture in Samoa was a combination of complete count and sample survey. Thus the census was basically two part operation. The first part involved all households (households identified as non-agriculture only being required to complete an abbreviated questionnaire. The second part of the questionnaire was designed to cover 25 percent of all agricultural holdings as identified in the first part, with selection made on systematic sample basis (every fourth holding selected). Thus while the Household Form was canvassed in respect of al households in the country, the parcel form was completed in respect of 25 percent of the agricultural holdings only.

Household list and Enumeration Area Maps

3.12 For any Census to be successfully carried out, good household lists and enumeration area maps are pre-requisites. A list of households in respect of each enumeration block in the country was prepared in 1997 for the Household Income and Expenditure Survey. This was used as a base for updating . A team of 8 officials went to the field in Upolu from February to April to update the household lists. In the light of experience of the last census of Agriculture, special care was taken to cover all the households in Apia Urban Area.

A team of 6 officials did the work of updating the household lists in Savaii from March to June. Thereafter maps were prepared for each enumeration area. In all there were 863 census blocks in Samoa for which household lists and enumeration maps were prepared.

3.13 The pretest of the tentative questionnaires was done by the staff of the Department of Statistics on 4th and 5th August 1999. Thereafter a Pilot Census was carried out in two villages, namely Solosolo and Tuanai in Upolu. The results of the pretest and pilot census were used in finalizing the questionnaires. The pilot census assisted the census staff to work out proper time schedule for the field work, helped them to clearly understand the concepts and definitions and also exposed them to some of the field problems. The pilot survey also proved very useful in preparing the training materials and in finalizing the tabulation programme of the Census.

Data Users/Producers Workshop

3.14 A two day workshop of data users and producers was held on 29-30 July 1999, where the scope of the Census and the questionnaires were discussed. It was a most interesting workshop and provided an opportunity for the interaction of data users and producers.

Organization of Census Field Work and Recruitment of Enumerators

3.15 The preparation of updated household list very much facilitated the demarcation of enumeration areas. Full time enumerators were recruited from the open market for field work. The job of recruitment of enumerators was left to the Agriculture Extension officers who acted as supervisors for the Census field work. In all 230 enumerators were recruited. In addition to these enumerators 10 officials from the Department of Statistics acted as enumerators. The Agricultural Extension officers and Senior officers of the Department of Statistics and Department of Agriculture acted as supervisors.

Printing Of Questionnaires And Instruction Manuals

3.16 In all there were three questionnaires and two instruction manuals one in Samoan and one in English. The questionnaires are given Annex 1.

The Government Printing was very helpful in printing adequate number of questionnaires and instruction manuals for the field teams well ahead of the training programme. Because of this, it was possible to distribute all the census materials to the individual training centers in advance.

Publicity

3.17 The main purpose of the census publicity is to ensure cooperation of the holders to provide requisite data Samoa being a small country word spreads through quickly. The kind of publicity that is required in a large country is not suitable here. The first opportunity provided by the fieldwork pertaining to the updating of the household lists was used to give publicity in the villages about the census Programme. The data user/producer workshop on Census of Agriculture that was held on 20-30 July 1999 was covered by T.V. The interviews held at that time provided a good opportunity to know about the census of Agriculture. Enumerators were mostly from their respective villages and this also helped in giving due publicity.

3.18 In addition throughout the training period and field enumeration there were spot-advertisements on the T.V and Radio twice daily and these became

very popular. In view of this, when the enumerators approached the households, they did not encounter any problems as the households were fully aware the census programme.

Training

3.19 One of the objectives of the project was to train the national staff on all aspects of agriculture census procedures including data collection, processing analysis, retrieval and dissemination. Extensive training programmes were organized at various levels to achieve this objective. It was a three stage training programme.

3.20 The first stage was for the master Trainers from the Department of Statistics and Department of Agriculture. About 20 officials participated in this two day training programme held on 9 – 10 August 1999. Training materials prepared included questionnaires and manuals and slides on the objectives of the census, scope, coverage, concepts and definitions and section by section explanations of the questionnaires. The overhead projector was extensively used by the two consultants and National Project Coordinator to explain fully the field procedures and the problems likely to be encountered and how to solve them. Clarifications sought were given. After the first day of the training each Master Trainer was asked to fill up the Household Form for one household and come up for discussion on the next day. On the second day the Master Trainers were divided into four groups. After discussing among themselves, they were asked to make presentations on their experiences.

3.21 The second stage training was for Agriculture Extension Officers who acted as supervisors. This was done separately for Upolu and Savaii on 13-15 October 99 respectively. The training of supervisors was entirely handled by the National Project Coordinator.

3.22 The third stage training was enumerators. This was done in batches at different centers and handled by the master trainers. Details of the training dates and number of participants can be seen in Annex II.

Census Enumeration

3.23 The Census enumeration started in the third week of October, both in Upolu and Savaii. In addition to the Supervisors, six officers of the Department of Statistics were appointed as coordinators to oversee the field work on a daily basis. Two were based in Savaii throughout period of the fieldwork.

Two other teams were in charge of the fieldwork in the North West and Rest of Upolu Regions.

The enumeration of the Apia Urban Area was conducted by officials of the department and two senior officers were appointed to co-ordinate and supervise the fieldwork.

In addition the National Project Coordinator and the counterpart officers from the Ministry of Agriculture Forests, Fisheries and Metrology visited the enumerators both in Upolu and Savaii during the fieldwork period. The fieldwork was completed in November in most parts of the country and all completed questionnaires were collected by the third week of December.

Collection of Forms

3.24 The collection of forms from the field followed an established procedure with the payment of honorarium to the enumerators being dependent on the completion of field work to an acceptable standard. The filled in forms were first required to be deposited with the supervisors. After scrutiny by them, the forms were collected by the coordinators. All the forms were stored in a systematic manner by enumeration area and by district at the Department of Statistics.

Post Enumeration Survey

3.25 Post Enumeration Survey is an integral part of Census. The main objective of post enumeration check is to evaluate the quality of the data collected. The post enumeration check in the current census was done in three parts.

a) As a part of the data collection activity, each supervisor was required to interview two households in each village to check the quality of data.

b) To check the farmers estimate of their parcel areas through the use of the objective measurement techniques (tape measure, compass and programmable calculator) some holdings were selected for this purpose.

c) An additional post census check was carried out on the livestock slaughtered and on farm labour.

The results of the post enumeration check are given separately.

Data Processing

3.26 The questionnaires for the Census of Agriculture were designed in such a way that data items were efficiently encoded and processed using IMPS (Integrated Microcomputer Processing System). The TCDC Expert on Statistical Data Processing, on his first mission, suggested some changes on the design of the questionnaire and the procedures on handling and storage of these forms during the data processing phase.

The data processing (manual and computer) was done in the Data Processing Section of the Department of Statistics. To facilitate the manual and machine processing of the forms, questionnaires from the same enumeration area were bound together in a batch/folio and assigned a batch id. This id consists of the District, Village and the enumeration area codes. These forms were subjected to manual data scrutiny and corrections.

The data entry was implemented using CENTRY of IMPS, and CONCOR for the validation of encoded data items. To facilitate the control and monitoring of the encoded folios, a Visual Basic program was developed by the TCDC Expert on his second mission. This program enabled the implementation of the IMPS data entry system in a LAN environment utilizing the Neighborhood Network of Windows 98. Other functions such as completeness check, structural check, validation of data consistency between Holding form and corresponding Parcel form, and batch/folio status monitoring were also included in this program. A team of 13 staff (3 permanent and 7 are hired) was assigned to do the data processing. The Chief of the Data Processing Section, acted as the supervisor for both the manual and computer processing. To ensure the quality of the data, these staffs were trained on manual scrutiny and corrections of the forms, and the data encoding. 50% Key verification was also done on all the batches, and questionnaires with key verification error rate higher than the tolerance limit was subjected to 100% key verification.
To have an idea of the quality of the data from the encoded questionnaires, preliminary and marginal statistical tables were generated. Additional checks were added in the validation program. Detected errors and inconsistencies were corrected in the batch files and others were automatically corrected using the hot deck imputation technique. Final statistical tables were generated using CENTS of IMPS. From the processed data entry files, a master file was generated. The format of this master file was designed to be able to accessed and processed using IMPS 4.1, i.e., Cross Tab and Map Viewer. Users with or without knowledge in computer programming can generate statistical tables using these programs and master files together with IMPS 4.1 stored in CDs.

HISTORY

1.04 It is believed by many that Samoa is the cradle of Polynesia in which Savaii is the legendary island Hawaii, the original home of Polynesians who later explored the Pacific from Hawaii to Easter Island. New Zealand archaeological research carried out in Samoa suggests that the islands have been inhabited for at least 2,500 years.

1.05 The first European who sighted the group and made brief contact with the population of Manua (American Samoa) was the Dutchman Jacob Roggerveen in 1722 followed by De Boungainville and then La Perouse who lost twelve of his crew after a discord with the Samoans. The first 'papalagi' (white people) to settle in Samoa were sailors, whalers, Beachcombers and escaped convicts, many of whom landed by chance in Samoa.

1.06 The first notable 'agents of change' were the Missionaries. After the arrival of John Williams of the London Missionary Society in the 1830's the Samoans were rapidly converted to Christianity. Methodist and Catholic Missionaries established Missions in the following years. From the 1840's onward, Germany, the United States and Great Britain extended their influence on the island groups to develop and protect their own commercial interests, often exploiting the internal turmoil between the larger or more important traditional families. In the 1880's as rivalry amongst the largest factions intensified, the Samoans turned to the foreign powers for support. In 1889, naval ships arrived to settle the problems. A major battle was only averted by a hurricane, which wrecked six of the seven ships. The fighting ceased and an elaborate agreement was reached in Berlin by the major powers. Samoa was allowed to remain a neutral state ruled by the three nations.

1.07 But again problems arose after the death in 1898 of Malietoa Laupepa, an important figure in keeping the peace. A civil war threatened, but again was prevented, after which the three powers signed a new convention; Germany was to administer the islands west of 171 degrees and the United States of America was to administer the islands to the east (now American Samoa).

1.08 After some initial problems, the German Administration was relatively stable and Samoa prospered. In 1914 New Zealand assumed the occupation of Samoa and in 1919 was granted a 'League of Nations' mandate to administer the country. Over the years, challenges to the New Zealand authorities grew, especially from amongst the (matais) chiefs, the traditional leaders, who organized themselves in forming the only opposing force (the Mau movement). Attempts to crush the resistance failed and finally in 1936 with the Labour Party in power in New Zealand, the Mau was recognized as a 'Legitimate Political party'.

1.09 In fear of a Japanese attack, the U.S. Navy occupied the country in 1942 but the Japanese never reached the Samoa. After World War II,

Samoa became a Trust Territory administered for the United Nations by New Zealand.

1.10 In 1953 preparations started for the transition to independence, which was finally obtained in January 1962 making Samoa the first South Pacific Island Nation to attain such status.

1.11 The country has a legislative assembly of 49 members of parliament, elected by those 21 years and over. However, only matai (customary title passed on land and kinship for most parts) could be elected as a member of parliament except two seats for the individual voters. The Prime Minister is elected by Parliament and he/she in turn appoints twelve cabinet members.

THE PEOPLE

1.12 The people of Samoa are Polynesian. Nevertheless, their culture differs in many respects from that of neighbouring Polynesian nations. The population totaled more than 161000 in 1991, and though mostly Samoans, includes other Polynesian Islanders, some Chinese and Europeans mostly from New Zealand.

1.13 Today, as in the past, the social unit of Samoan life is the 'aiga' or extended family. The 'aiga' is headed by at least one matai, who is appointed by the consensus of the aiga. There are two distinct types of matai titles, the "Ali'i' or Chief Matai and the 'Tulafale' or Orator Chief. The matai assumes responsibility for directing the use of family land, and, other assets belonging to the aiga. He must by his behavior honor the title he bears and the people he represents. In return for his leadership, the matai is rendered services by the 'tautua' (untitled).
Local authority is also in the hands of the matai who constitute the council or 'fono' of the village. Presiding over the fono is the 'pulenu'u' (village mayor). A position appointed by Government on recommendation from the village council and usually rotated within a group of influential matai.

1.14 Rooted in this social organization is the Samoan Way or 'fa'a-Samoa', which places great importance on the dignity and achievement of the group rather than its individual members. Religion plays an important role in Samoan life where the majority of the people are strong adherents to the christian faith. This faith is symbolized in the motto of Samoa, 'Fa'avae I le Atua Samoa' (Samoa is founded on God) and is given physical expression in the impressive number of churches seen throughout the country.

POPULATION CENSUS

1.15 Very little is known about the size of the population of the Samoan Groups before the arrival of missionaries in the early 1830's. Some

estimates are available but knowledge about the islands was too limited and estimates made by early settlers were generally unreliable. The situation improved during succeeding years, particularly as a result of missionary reports, but the difficulty of collecting and verifying figures led to considerable variations in the accuracy of early estimates.

1.16 The 1853 and 1869 Missionary Censuses were perhaps the first attempt at scientific measurement of the population of Samoa. These two censuses estimated the population at about 30,000 but given the limited capability to conduct censuses, they were both probably under counts of the true population. The various estimates available in the second half of the nineteenth century showed little variation from this figure. This relative stability over time was a consequence of the balance between the high birth rate, which led to rapid growth in some years, and the high death rates in other years as epidemics of diseases spread through the country.

1.17 The population of the Samoan archipelago since or even before Western contacts has been the subject of much discussion. Figures available for periods earlier than those covered by the Missionary census, suggest that in the 1830's the population was closer to 50,000, indicating that a steep decline in the population did occur in the islands that now constitute Samoa. During the nineteenth century a similar decline had been observed in other Polynesian countries. However, all these data should be treated with caution, since their source and reliability vary considerable. Though they provided some strong evidence that population decline occurred, the extent of that decline must remain very much in doubt.

1.18 More reliable population figures are available from censuses carried out during the twentieth century. The German Authorities made population counts in 1900, 1902, 1906 and 1911. In 1917 the New Zealand administration carried out its first census of Samoa and from 1921 introduced a regular 5 yearly census. In 1905 the German authorities also instituted a system of birth and death registration. The Population as recorded at the various censuses from 1902 to 1991 is shown in Table 1.1.

Table 1.1 Population of Samoa 1902-1986

Census Year	Samoan Population	Total Population (Including Other Nationalities)
1902	32,612	n. a.
1906	33,478	37,320
1911	33,554	38,084
1917	35,404	37,331
1921	32,601	36,422
1926	36,688	40,231
1936	52,232	55,946
1945	62,422	68,197
1951	80,153	84,909
1956	91,883	97,327
1961	113,101	114,427
1966	130,110	131,377
1971	144,111	146,627
1976	150,089	151,983
1981	153,920	156,349
1986	156,000	157,408
1991	158,121	161,289

1.19 In the beginning of the twentieth century several epidemics reversed the increasing trend in population growth that had occurred in the earlier years. The 1918 epidemic was the first major set back to New Zealand prestige and consequently great emphasis was placed on the improvement of health conditions and sanitation. This proved successful as shown by the rate of population growth in the next-decades, which grew as a result of continuing high fertility and a short-drop in mortality. After 1945 mortality continued to decline, though less pronounced than in the 1920 and 1930s Fertility remained at a high level in conformity with the Samoan cultural tradition favorable to large families.

1.20 A distinctive feature of population of Samoa is emigration. Emigration in the first half of the twentieth century was of minor importance. It was only during 1960s that the trend of extensive overseas migration, especially to New Zealand began to accelerate. In 1976 it was estimated that more than 27,000 Samoan residents were enumerated there and by 1991 this figure has grown to some 85,743. The impact of overseas migration on the growth of the population has been of major importance, and has also had a profound influence on the social and economic structure of the country. In terms of its impact on the population size, the movement has been heavy in absolute terms, reducing the potentially large increase of the population that would have resulted from the combination of high birth rates and low death rates to very moderate levels.

Further, since the migrants are mostly people in the early reproductive ages, many ethnic Samoan children are born overseas. The greater part of the slowing growth rate at least up to the late 1980s, must consequently be explained by the large out flow of persons from Samoa. There is however some evidence that the pace of emigration has slowed down in the part few years.

THE ECONOMY

1.21 The economy of Samoa is dominated by village based Agriculture, remittances from family members working overseas and external aid. The social and cultural institutions of Samoa Society (fa'a-Samoa) are strong and more intact than in most parts of Polynesia.

The country's system of village government is particularly well organized and coherent and is the focal point of a network of social relationships that provide honor and prestige to its members. However, Samoa is no longer a society of largely self sufficient local units. Imported food and other items are now established as basic household necessities.

Statement of Economic Strategy 2000 – 20001

"The contribution of agriculture has continued to decline since 1995 and continued throughout 1998 and the first half of 1999. In 1998 agriculture contributed 12.2% of the GDP. This had fallen to 11.9 % in the first half of 1999. More generally the subsistence sector of the economy contributed 16.8% in 1998 and 16.3% in 1999. By contrast fisheries have been increasing its contribution to GDP rising from 4.4% in 1994 to 6.1% and 6.9% in 1998 and first half of 1999 respectively."

The decline in the relative importance of the sector can be attributed to two 'one hundred' year cyclones in 1990 and 1991 and the devastation of Taro Leaf Blight in mid 1990's.

The challenge is therefore to revive village agriculture through initiatives to redevelop agricultural traditional crops as well as encouraging diversification. The revitalization of the village economy has therefore been accorded a high priority in the 2000-2001 SES (Statement of Economic Strategy) period.

Chapter IV
CONCEPTS AND DEFINITIONS

4.01 Household

One or more persons who live together and have their meals together.

Note that:

- Just one person, living on his own and looking after himself/herself is considered a household.
- Usually a household occupies one building but in a few cases two or even more households may share one building. For example, four households living in an apartment building containing four apartments.
- Alternatively, one household can occupy more than one building, for example, one household using a living fale, sleeping fale, kitchen fale and three small fales.
- An Aiga is normally composed of several households.

4.02 Head of Household

The person who is considered to be the head by the members of a household, that is, all persons living in the household.

4.03 Level of Agricultural Activity

Non-Agricultural - This means that the household does not engage in any crop production. Such households may own or look after land NOT IN USE and also own or look after livestock.

4.04 Minor Agricultural Activity

The household has only very few crops defined as less than 625 sq. yards (25 x 25 yds.) of land under garden crops or less than 20 coconut trees or less than 20 Banana plants or less than 20 other tree crops.

4.05 Subsistence Only

The household produces crops but does not sell.

4.06 Subsistence and Cash Cropping

The household's main purpose of agricultural productions is to feed itself (subsistence) but some crops or surplus crops are sold.

4.07 Commercial

The households in this category differ from those in category 4 by the fact that their main purpose of production is to sell their produce either locally or for export.

4.08 Holding

An agricultural holding is an economic unit of agricultural production under single management comprising of all livestock kept and all land used wholly or partly for agricultural production purposes, without regard to title, legal form or size. Single management may be exercised by an individual or household, jointly by two or more individuals or households by a clan, or tribe or by a juridical person such as corporation, cooperative or government agency.

The holding's land may consist of one or more parcels, located in one or more separate areas or in one or more enumeration areas, provided the parcels share the same production means utilized by the holding such as labor, farm buildings or machinery.

4.09 Individual Household on Own Account

This refers to the holding operated by member(s) of a single household.

4.10 In Partnership

The holding is operated in association with one or more partners who may be related or not related *but who live in different households* and thus have different principal homesteads.

4.11 Village Association

The holding is operated by an association or committee, an example of this is the Women's Committee, that could either be crop or livestock or poultry production or any combination of them.

4.12 Institution

The holding is operated by a religious institution or organization through a hired manager. An institution is an organization providing a specific service or performing some general public function for a group of individuals such a prison, hospital, hotel, church boarding school etc.

4.13 Operator

An operator of agricultural holding is the person who exercises management control over the operation of the agricultural holding. Where a single household is operating the holding, the head of the household in most cases

is the operator. A holding can have more than one operator especially in cases where the holding is being operated as partnership or some other form of joint operation. In some cases the operator is not necessarily the head of the household, or the owner of the place or the matai of an aiga, he/she may be a member of the owner's household, a hired manager, a tenant or a renter, a person who operates customary land as assigned to him/her by his matai or a person who operates the land under government permit.

4.14 Crops Not Grown in 1999

The crops were grown before the year 1999 but still producing or yielding agricultural produce as of the time of visit.

4.15 Crops Currently growing in 1999

The crops were planted before 1999 but still growing at the time of visit or day of enumeration.

4.16 Crops Grown in 1999

The crops were planted anytime within the year 1999.

4.17 Parcel

A holding parcel is any piece of land entirely surrounded by other land, water, road, forest etc., not forming part of this holding. A parcel may consists of one or more fields adjacent to each other. In other words a parcel is a contiguous piece of land in a holding. The entire land of the holding may consist of one or more than one parcel.

Illustration 1: A holding with one parcel with four plots

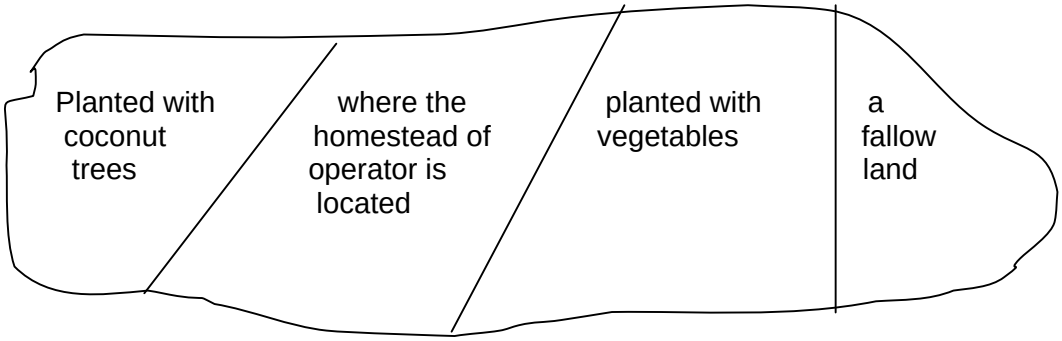


Illustration 2: A holding with two parcels in which one has two plots and the

other has one plot.

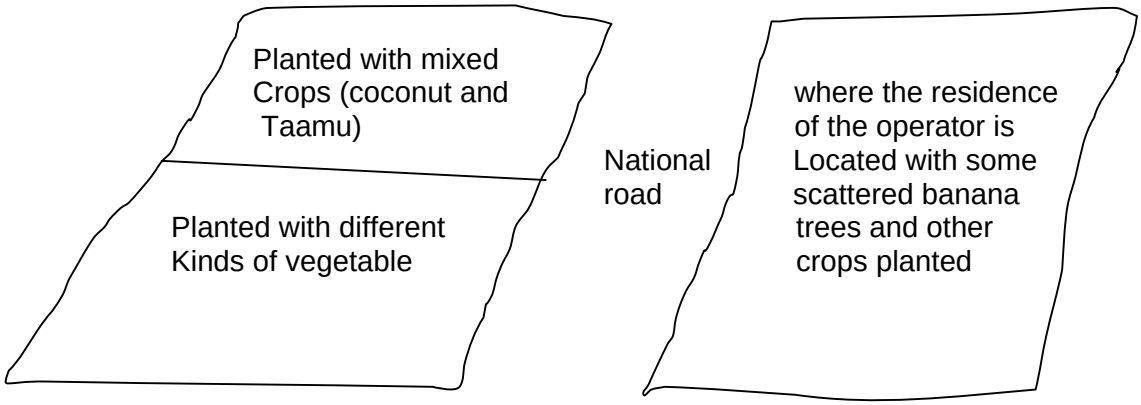
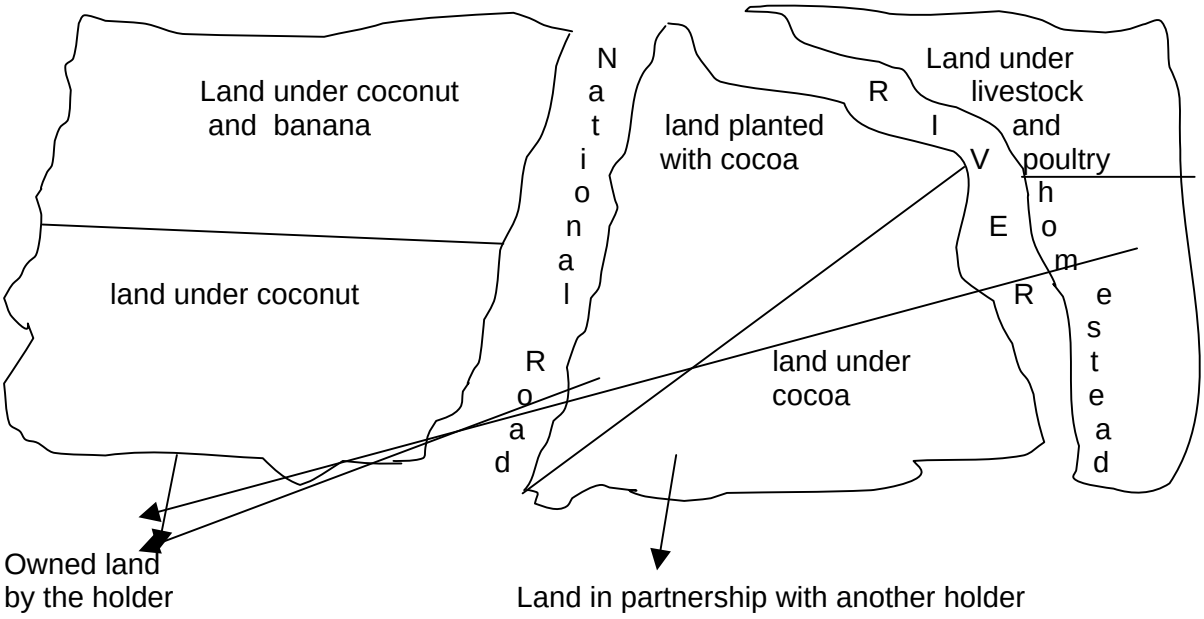


Illustration 3: A holder operates two holdings, one of his own and the other one in partnership with another holder who belongs to another household.



Note: The owned land of the holder has three parcels, two parcels with two plots each and another with one plot. The holding in partnership with another holder has only one parcel with only one plot.

4.18 Land Tenure

Land Tenure refers to arrangements or rights under which the holder holds or uses holding land.

4. 19 Land use

This provides a classification of the holding according to the activity, which is directly related to the land, or holding, makes use of its resources or has an impact upon it.

4.20 Land under tree crops

These are trees bearing edible fruits or nuts. The trees them selves should usually have an economic life of more than five years. Example includes mango, banana, coconut cocoa, citrus, breadfruit etc.

4.21 Land under other crops

The other crops include field crops like taro, taamu, cassava, yam, sugarcane and vegetable crops like eggplant, beans, cabbage, tomato etc.

4.22 Land under tree crops and other crops

If the land is both under tree crops and other crops, it should be classified as land under tree crops and other crops.

4.23 Land under fallow.

Fallow land is land that was used for growing crops sometime in the past but currently not used for growing crops.

4.24 Land under virgin bush

Land which was never cultivated but is covered with bush is to be classified as land under virgin bush.

4.25 Land under non-agricultural uses

This is the land that is under buildings, roads and other non-agricultural uses.

4.26 Land under livestock and poultry.

This land is used for raising or tending livestock like cattle, goats, pigs, etc. and poultry like chickens, etc.

4.27 Period of Use

This refers to the number of years that each reported parcels was used.

4.28 Plot

A plot is a part or whole of a parcel on which a specific crop or crop mixture is cultivated. A plot can also be a fallow land or land ready for planting or bush plot or plot under other use like homestead.

4.29 Land Area

Land area is the physical measure of the land in acres. There are 4,840 square yards in an acre. As a rough guide the following proportions of an acre are represented by squares whose sides have the following lengths.

Area in Acres	Length of sides of square in yards
1	70
¾	60
½	50
¼	35
1/8	25

4.30 Single cropped

A "single cropped" pattern refers to one crop' which has been planted in a regular pattern such as rows. If there are a few other trees/plants of different crops in scattered plantings over the plot, consider the plot to be 'single cropped' to the crop that is planted in a regular pattern.

4.31 Mixed Crop

A "mixed crop" pattern refers to two or more crops which are interplanted in a regular pattern such as rows. Again if there are a few scattered plantings of other crops do not consider them to be crops that are interplanted in a "mixed cropped" combination.

4.32 Scattered Crop Pattern

A scattered pattern refers to crops/plants which have not been planted in any regular pattern such as rows or some uniform method of spacing. Scattered crops/plants can be found among plants of a regularly (pattern) planted plot.

4.33 Inorganic fertilizers

These are manufactured mineral substances applied to soil, or irrigation water, to supply plants with the necessary nutrients.

4.34 Organic fertilizers

These are materials of organic origin, either natural or processed, that can be used as sources of plant nutrients. The most commonly used are dried leaves, chicken manure or other animal manure, etc.

4.35 Agricultural chemicals

These are used for controlling or eliminating pests that destroy crops or livestock. These include insecticides, fungicides, fumigants, herbicides, rodenticides and various other materials.

4.36 Inshore Fishing

Fishing activity done from the shoreline to the reef.

4.37 Offshore Fishing

This is a deep sea fishing activity done beyond the reef.

4.38 Inland Fishing

Fishing activity done in inland water like river.

4.39 Reference Periods

Agriculture Census 1999

The general reference period is one calendar year i.e. 1st January 1999 to 31ST December 1999. However, for the purpose of this census, the reference period is from January 1, 1999 to the time of visit or day of enumeration.

Enumeration Period

Between third week of October and 30 November 1999.

Number of Holdings and Method of Operation

Calendar year 1999.

Total Area of the Holding Section and Crops Grown

Day of Enumeration and Calendar Year 1999.

Livestock

Day of Enumeration

Labor InputsI

One month prior to day of enumeration.

Agriculture Income

Calendar year 1999.

Use of Fertilizers, Agricultural Chemicals and High Yielding Varieties

Calendar year 1999

Fishing

Calendar year 1999

Forestry

Calendar year 1999

Chapter V
CENSUS RESULTS

AGRICULTURAL ACTIVITY	
TOTAL NUMBER OF HOUSEHOLDS	20,521
NUMBER OF AGRICULTURALLY ACTIVE HOUSEHOLDS	14,725
NUMBER OF NON-AGRICULTURAL HOUSEHOLDS	4,199
NUMBER OF MINOR AGRICULTURAL HOUSEHOLDS	1,597
TOTAL NUMBER OF HOLDINGS	14,734
TOTAL NUMBER OF PARCELS	35,317
CHARACTERISTICS OF THE AGRICULTURALLY ACTIVE HOUSEHOLDS	
POPULATION OF AGRICULTURALLY ACTIVE HOUSEHOLDS	123,948
NUMBER OF AGRICULTURAL OPERATORS	14,778
NUMBER OF UNPAID LABORERS WORKING IN THE HOLDING	10,241
NUMBER OF PAID LABORERS EMPLOYED IN THE HOLDING	1,366
PERCENTAGE OF AGRICULTURALLY ACTIVE HOUSEHOLDS DERIVING INCOME FROM AGRICULTURE	52.2%
PERCENTAGE OF AGRICULTURALLY ACTIVE HOUSEHOLDS AVAILING LOANS FOR AGRICULTURE PURPOSES	8.1%
PERCENTAGE OF AGRICULTURALLY ACTIVE HOUSEHOLDS WITH ELECTRICITY	92.4%
PERCENTAGE OF AGRICULTURALLY ACTIVE HOUSEHOLDS WITH PIPED RUNNING WATER	80.8%
PERCENTAGE OF HOLDINGS OWNING AGRICULTURAL EQUIPMENT	56.5%
PERCENTAGE HOLDINGS BORROWING AGRICULTURAL EQUIPMENT	26.7%
SALE OF MAJOR CROPS/PRODUCTS	
PERCENTAGE OFAGRICULTURALLY ACTIVE HOUSEHOLDS SELLING YOUNG AND/OR MATURED COCONUTS	25.9%
PERCENTAGE OF AGRICULTURALLY ACTIVE HOUSEHOLDS SELLING COPRA	13.2%
PERCENTAGE OFAGRICULTURALLY ACTIVE HOUSEHOLDS SELLING COCOA	17.9%
PERCENTAGE OF AGRICULTURALLY ACTIVE HOUSEHOLDS SELLING BANANA	17.4%
PERCENTAGE OF AGRICULTURALLY ACTIVE HOUSEHOLDS SELLING TARO	17.5%
PERCENTAGE OFAGRICULTURALLY ACTIVE HOUSEHOLDS SELLING TAAMU	23.3%

CONSUMPTION OF MAJOR CROPS	
PERCENTAGE OF HOUSEHOLDS CONSUMING COCONUTS FOR DRINKING	31.7%
AVERAGE WEEKLY CONSUMPTION OF DRINKING COCONUTS	11 nuts
PERCENTAGE OF HOUSEHOLDS USING COCONUTS FOR COOKING	68.1%
AVERAGE NUMBER OF COCONUTS USED FOR COOKING PER WEEK	38 nuts
PERCENTAGE OF HOUSEHOLDS USING COCONUTS FOR FEEDING ANIMALS	54.6%
AVERAGE NUMBER OF COCONUTS USED FOR FEEDING ANIMALS PER WEEK	102 nuts
PERCENTAGE OF HOUSEHOLDS CONSUMING COCOA	51.1%
AVERAGE WEEKLY CONSUMPTION OF COCOA	4 cups
PERCENTAGE OF HOUSEHOLDS CONSUMING BANANA	77.9%
AVERAGE WEEKLY CONSUMPTION OF BANANA	3 bunches
PERCENTAGE OF HOUSEHOLDS CONSUMING NATIVE TARO	23.8%
AVERAGE WEEKLY CONSUMPTION OF NATIVE TARO	13 pieces
PERCENTAGE OF HOUSEHOLDS CONSUMING TARO PALAGI	41.5%
AVERAGE WEEKLY CONSUMPTION OF TARO PALAGI	2 baskets
PERCENTAGE OF HOUSEHOLDS CONSUMING TAAMU	65.7%
AVERAGE WEEKLY CONSUMPTION OF TAAMU	6 pieces
LIVESTOCK AND POULTRY *	
TOTAL NUMBER OF HOUSEHOLDS RAISING LIVESTOCK	15,915
TOTAL NUMBER OF HOUSEHOLDS KEEPING LIVESTOCK	15,901
LIVESTOCK/POULTRY KEPT AS OF ENUMERATION	
NUMBER OF COWS & HEIFERS TWO YEARS AND OVER	15,000
NUMBER OF BULLS & STEERS TWO YEARS AND OVER	7,000
NUMBER OF OTHER CATTLE	6,000
TOTAL NUMBER OF CATTLE	28,000
TOTAL NUMBER OF HORSES	2,000
TOTAL NUMBER OF PIGS	167,000
TOTAL NUMBER OF GOATS	2,000
TOTAL NUMBER OF CHICKENS	431,000
TOTAL NUMBER OF OTHER LIVESTOCK	2,000
FISHING/FORESTRY	
PERCENTAGE OF HOUSEHOLDS ENGAGED IN FISHING	32.6%
PERCENTAGE OF FISHING HOUSEHOLDS USING FISHING GEARS	97.0%
PERCENTAGE OF FISHING HOUSEHOLDS USING FISHING BOATS	31.5%
PERCENTAGE OF HOUSEHOLDS THAT PLANTED FOREST TREES	51.4%

* Rounded off to the nearest thousands.

SIZE OF THE AGRICULTURAL HOLDINGS	
TOTAL AREA OF THE HOLDINGS (in acres)	131,909 acres
AVERAGE AREA PER HOLDING (in acres)	9 acres
AVERAGE NUMBER OF PARCELS PER HOLDING	2.4
METHOD OF OPERATION	
TOTAL AREA OF THE HOLDINGS UNDER INDIVIDUAL OPERATOR	131,556 acres
TOTAL AREA OF THE HOLDINGS OPERATED BY PARTNERSHIP	347 acres
TOTAL AREA OF THE HOLDINGS OPERATED BY VILLAGE ASSOCIATION	0.3 acre
TOTAL AREA OF THE HOLDINGS OPERATED BY INSTITUTION	6 acres
LAND TENURE OF THE PARCELS	
TOTAL AREA OF PARCELS UNDER CUSTOMARY LAND	119,151 acres
TOTAL AREA OF PARCELS UNDER LEASED CUSTOMARY LAND	1,106 acres
TOTAL AREA OF PARCELS UNDER LEASED GOV'T LAND	2,176 acres
TOTAL AREA OF PARCELS UNDER OWNED FREE HOLD LAND	8,010 acres
TOTAL AREA OF PARCELS UNDER LEASED FREE HOLD LAND	476 acres
TOTAL AREA OF PARCELS UNDER OTHER LANDS	992 acres
MAIN LAND USE OF THE PARCELS	
TOTAL AREA OF PARCELS UNDER CROPS	114,763 acres
TOTAL AREA OF PARCELS UNDER LIVESTOCK/POULTRY	6,253 acres
TOTAL AREA OF PARCELS UNDER BUSH/FALLOW	5,692 acres
TOTAL AREA OF PARCELS UNDER NON-AGRICULTURE USE	4,646 acres
FERTILIZERS, AGRICULTURAL CHEMICALS AND IMPROVED VARIETIES	
PERCENTAGE OF HOLDINGS USING INORGANIC FERTILIZERS	13.7%
PERCENTAGE OF HOLDINGS USING ORGANIC FERTILIZERS	14.8%
PERCENTAGE OF HOLDINGS USING AGRICULTURAL CHEMICALS	43.3%

SINGLE CROP EQUIVALENT AREAS (IN ACRES) *	
AREA UNDER COCONUT	46,300 acres
AREA UNDER COCOA	9,900 acres
AREA UNDER BANANA	10,600 acres
AREA UNDER OTHER TREE CROPS	3,800 acres
AREA UNDER TARO & TARO PALAGI	10,500 acres
AREA UNDER TAAMU	11,900 acres
AREA UNDER OTHER FIELD CROPS	7,200 acres
NUMBER OF SCATTERED TREE CROPS *	
COFFEE	2,000
ORANGES	3,000
AVOCADO	1,000
BREADFRUIT	89,000
GRAPEFRUIT	1,000
LEMON	2,000
LIME	2,000
MANGO	7,000
PAPAYA	37,000

* Rounded off to the nearest hundreds for single crop equivalent areas and nearest thousands for scattered tree crops.

INTRODUCTION

5.01 The large amount of data collected in the Census of Agriculture 1999, relating to the characteristics of households, holding crops, livestock, fisheries and forestry are presented in the form of 89 tables. With the exception of Tables 50-64, wherein the details are presented at the regional level only, the rest of the table's information is given at the village district and regional levels. As the Census covered only the private households in the country, the data contained in these tables excludes commercial establishments and institutions. For completeness, information for the formal sector is presented and discussed at the end of this chapter.

5.02 It is intended in this chapter to present only the highlights of the census results. The interests of the users of the data are varied in nature and it is therefore left to them to undertake in-depth analysis of the data depending on their individual requirements. To facilitate this a master file has been designed which can be accessed and processed using IMPS 4.1 i.e. Crosstab and Map Viewer. Users with or without knowledge in computer programming can generate statistical tables using these programmes and master files together with IMPS 4.1 stored in CD's. However, the interpretation of the data by the users should be preceded by a careful understanding of the concepts and definitions, methodology followed and the limitations of data.

HOUSEHOLDS AND THEIR CHARACTERISTICS

Households

5.03 The Census enumerated 20521 households in Samoa (See Table 1). The percentage number of households in each of the regions is given below.

Table 5.1 Number of Households, by Region: 1999

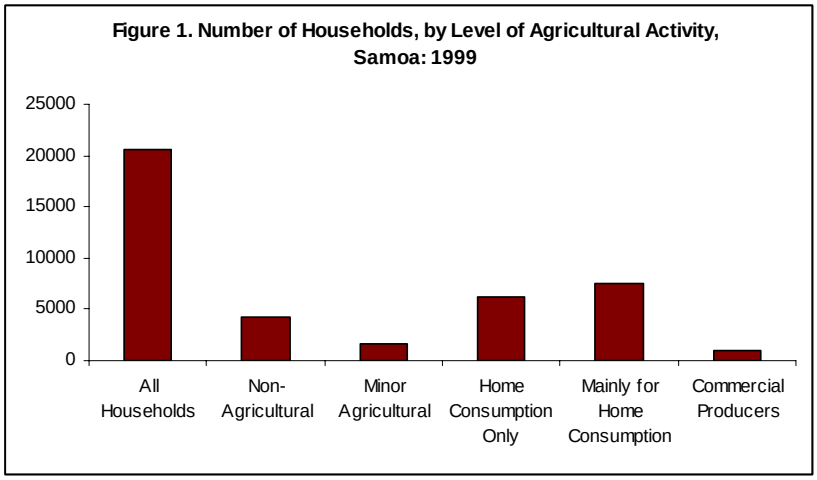
Region	No of Households	Percentage
Apia Urban Area	4,449	21.68
North West Upolu	6,189	30.16
Rest of Upolu	4,761	23.20
Savaii	5,122	24.96
SAMOA	**20,521**	**100.00**

Three-fourths of the households are in Upolu. Apia Urban Area accounts for 22 percent of the households in the country. Amongst the districts, Vaimauga West (11 percent), Faleata West (9 percent), Faleata East (7 percent), and Sagaga Le Falefa (5 percent) together cover 32 percent of the households in Samoa.

Level of Agricultural Activity of Households

5.04 Five categories were used in the census to establish the level of agricultural activity of each household. Three of these categories classified households as agriculturally active (home consumption only, mainly home consumption and commercial), while the remaining two classified households as non-agriculturally active (non-agricultural and minor agricultural).

For the country as a whole the census recorded 72 percent of the households as agriculturally active with the remaining 20 percent of the households classified as non-agriculturally active and 8 percent as minor agricultural households. Figure 1 shows the number of households by level of agricultural activity for the country as a whole.



5.05 Within the country wide geographical variation was observed. In Savaii 96 percent of all households were agriculturally active while in Upolu 64 percent were classified as agriculturally active. Of greater contrast was variation of agricultural activity within the three regions of Upolu. While the Rest of Upolu region exhibited similar characteristics to Savaii with 96 of the households agriculturally active, in North West Upolu this percentage was 65 and in Apia Urban Area it was 27 percent.

5.06 Considering the districts, Sagaga Le Falefa (899) has the highest number of agriculturally active households followed by Vaimauga West (797) and Faleata West (797), Aana Alofi (617) and Falealili (552). In Savaii Salega (460) has the highest number of agriculturally active households followed by Palauli (407) and Palauli le Falefa (385).

5.07 Depending on the number of Extension Officers, the Ministry of Agriculture has divided the country into agricultural districts. Using the data file, they can rebuild the relevant statistics for the agricultural districts.

Commercial Producers

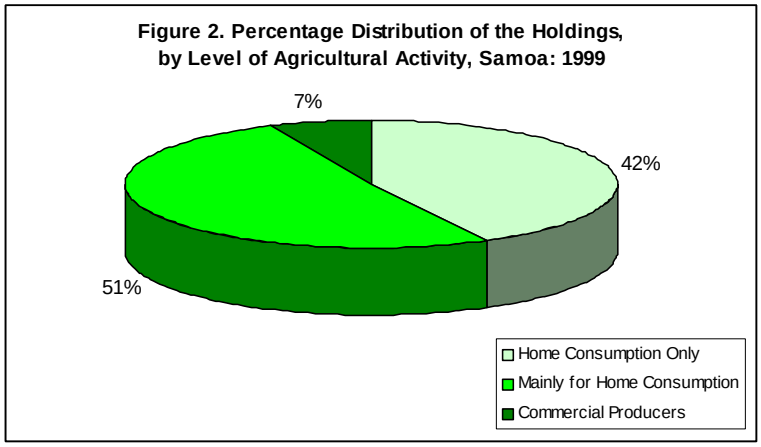
5.08 There were 960 households, which were classified as commercial producers, (i.e their production is mainly for sale). Eighty percent of

the commercial producers were in Upolu and the remaining twenty percent in Savaii. Commercial producers numbered about 374 (39 percent) in North West Upolu, 261 (27 percent) in Rest of Upolu and 192 (20 percent) in Savaii.

Level of Agricultural Activity of the Holdings

5.09 Table 2 gives the number of holdings by location of household and level of agricultural activity. Households in some cases have more than one holding. Two or more households may also be operating a holding jointly. Therefore the number of agricultural households and the number of agricultural holdings may not be the same.

5.10 There were 14,734 agricultural holdings in Samoa according to Census of Agriculture 1999. Figure 2 gives the percentage distribution of holdings by level of agricultural activity.



5.11 Fifty one percent of the holdings were classified as mainly for Home Consumption i.e. agricultural production was mainly to provide for the needs of the household but an element of production was for sale. A further 42 of the holdings were classified as 'Home Consumption only' and 7 percent as commercial.

5.12 Regionwise, the distribution of agricultural holdings is given below in Table 5.2.

Table 5.2 Number of Agricultural Holdings, by Region: 1999

Region	No of Holdings	Percentage
Apia Urban Area	1,227	8.33

North West Upolu	4,029	27.34
Rest of Upolu	4,573	31.04
Savaii	4,905	33.29
SAMOA	**14,734**	**100.00**

Sixty seven percent of the holdings were Upolu, the remaining 33 percent in Savaii.

5.13 There is a change in the pattern of commercial holdings in the current census as compared to the last Census. While in the last Census bulk of the commercial holdings (65 percent) were in Savaii, this percentage in the current census for Savaii is only 20 percent. Bulk of the commercial holding (80 percent) are in Upolu only.

FRAGMENTATION OF HOLDINGS

5.14 A holding may consist of one or more parcels of land. Table 3 shows that some 35317 parcel were recorded on 14,734 holdings in the country giving an average of 2 parcels per holding. The average number of parcels in different regions of the country is given below in Table 5.3.

Table. 5.3 Average Number of Parcels Per Holding,
by Region, Samoa: 1999

Region	Average Number of Parcels
Apia Urban Area	2
North West Upolu	3
Rest of Upolu	2
Savaii	3
Samoa	**2**

5.15 The average number of parcels per holding is now two (2) in Samoa as compared to 3 in the last census. Amongst the districts Faasaleleaga IV has an average of 5 parcels per holding. Palauli East and Gagaemauga III have 4 parcels per holding.

POPULATION CHARACTERISTICS OF AGRICULTURAL HOUSEHOLDS

5.16 The number of persons in the households were enumerated for all the 20,521 households covered in the census of Agriculture 1999. The total population in the households was estimated to be 164,217. This figure does not include persons living in Hotels and Restaurants and Institutions like churches, boarding schools, etc. Therefore this is not the total population of the country in 1999.

5.17 The relevant data from the Census of Agriculture 1999 is the population of the agriculturally active households.

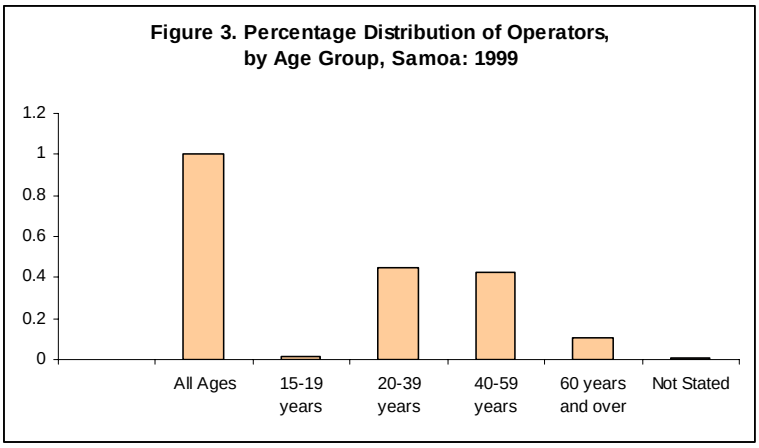
Table 5.4. Population in the Agriculturally Active Households, by Region, Samoa: 1999

Region	Total Household Population	Population in the Agriculturally Active Households	Percentage
Apia Urban Area	32,000	10,000	31
North West Upolu	50,000	34,000	68
Rest of Upolu	40,000	39,000	98
Savaii	42,000	41,000	98
Samoa	**164,000**	**124,000**	**76**

5.18 While 76 percent of the population in Samoa was in agriculturally active households, this percentage for Rest of Upolu and Savaii was 98 percent each.

Number of Agricultural Operators

5.19 Table 14 gives the details of the operators of agricultural holdings by sex and age groups. Ninety eight percent of the operators were males and only two- percent females



In terms of age group, the younger age group (20 – 39) has the highest percentage of operators (45 percent) followed by 43 percent in the age group of 40 – 59. Ten percent of the operators were in the age group of 60 years and over. As compared to last census, younger age group has taken over the operation of agricultural holdings.

Job Status

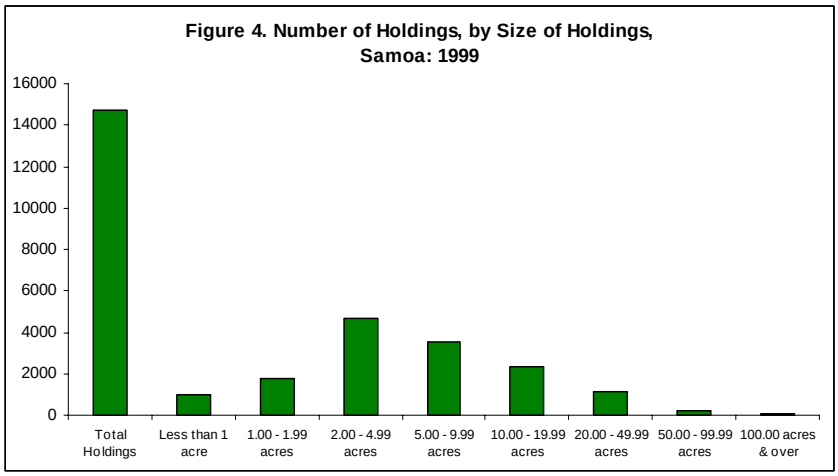
5.20 Tables 15 to 17 gives information on the 'Job Status' of the operator. The census recorded 87 percent of the operators had no paid job, 10 percent had full time paid job and 3 percent had part time paid job; similar to the situation in the last census. The data relating to the average number of hours worked by the

operator during the month prior to enumeration are given in Table 18. On an average the operator worked for 75 hours during the month prior to census with male operator working for longer hours on an average (77 hours) than females (64 hours). This is equivalent to some 3 hours per day based on a 6-day week.

CHARACTERISTICS OF AGRICULTURAL HOLDINGS

Number of Holdings

5.21 Altogether some 14,734 agricultural holdings were recorded in the census with 9822 (67 percent) in Upolu and 4912 (33 percent) in Savaii. Figure 4 gives the number of holdings by size of holding. It will be seen that 32 percent of the holdings were in the size group of 2.00 – 4.99 acres and another 24 percent in the size group of 5.00 – 9.99 acres)



5.22 The percentage distribution of holdings in different regions by size of holding is given in Table 5.5

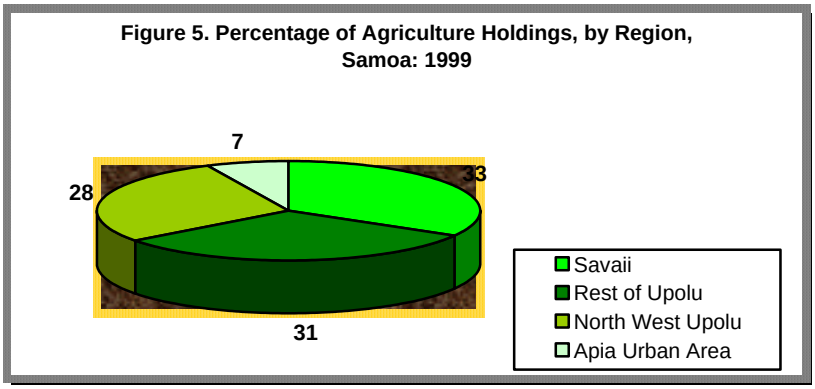
Table 5.5 Percentage Distribution of Holdings by Region and Size of Holding (In Acres), by Region, Samoa: 1999

REGION	0.01 – 0.99	1.00 – 1.99	2.00 – 4.99	5.00 – 9.99	10.00 – 19.99	20.00 – 49.99	50.00 – 99.99	100.00 & over	All Sizes
Apia Urban Area	28	22	29	11	5	3	1	1	100
North West									

Upolu	13	18	38	20	8	3	-	-	100
Rest of Upolu	2	12	35	23	16	10	2	-	100
Savaii	2	5	25	31	24	11	2	-	100
Samoa	7	12	32	24	15	8	1	-	100

5.23 As compared to the last census, the number of holdings below ten acres has increased. While 54 percent of the holdings were below 10.00 acres in 1989, this percentage in 1999 was 75.

Figure 5 gives the percentage distribution of agriculture holdings Regionwise.



Area of the Holding

5.24 The total land area covered by the 14,734 holdings in Samoa was 131,909 acres giving an average holding size of 9 acres. As compared to the last census, the total land area covered by the holdings has gone down by nearly 34500 acres; a drop of 21 percent.. The decrease in the area has to be seen in the context of two Cyclones, which hit country in 1990 and 1991, and also Taro Leaf Blight in mid 1993. The livestock and fishing sectors are becoming increasingly important resulting in a change in the agricultural structure of the country. The fact remains that agriculture in Samoa has not recovered to the level of 1989 after the two Cyclones and Taro Leaf Blight in mid 1993.

5.25 The number of holdings, the total area and average size of holdings in different regions of Samoa are given in Table 5.6.

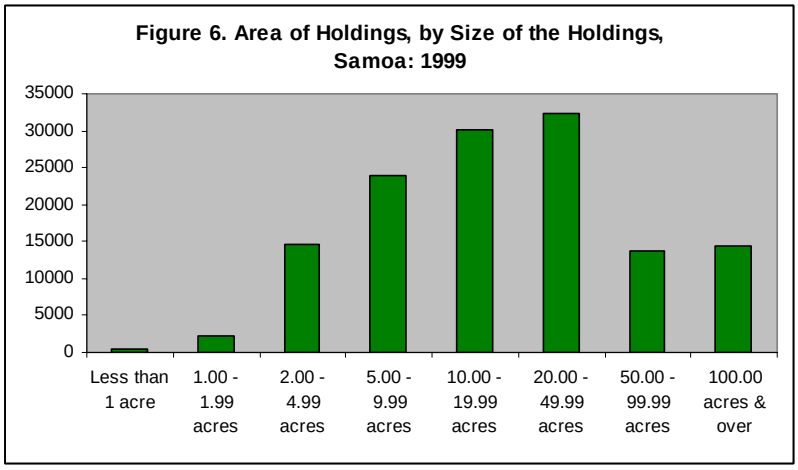
Table 5.6 Number of Holdings, Total Area and Average size of Holdings, by Region Samoa: 1999

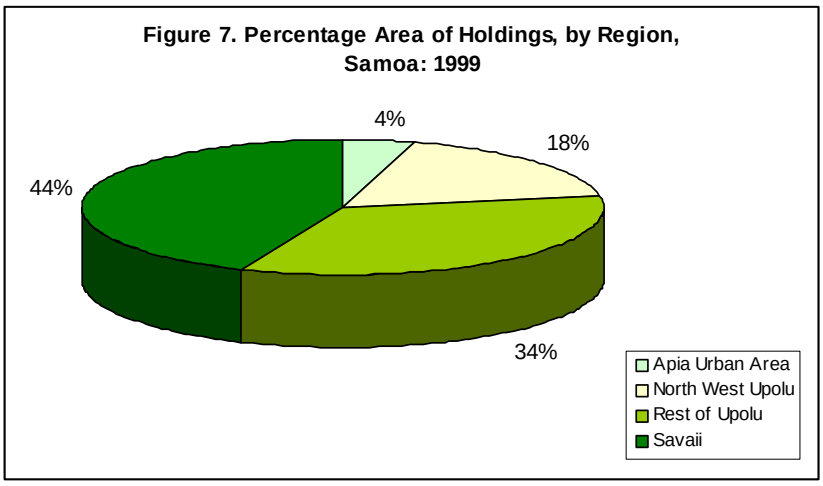
Region	No. of Holdings	%	Total Area (In Acres)	%	Average Size
Apia Urban Area	1,227	8	5,883	4	5
North West Upolu	4,029	28	23,326	18	6

Rest of Upolu	4,573	31	45,197	34	10
Savaii	4,905	33	57,503	44	12
Samoa	14,734	100	131,909	100.00	9

As compared to the last census, the average size of the holding has gone down from 15 acres to 9 acres. This decline was observed in all the regions. The average size of the holding in Savaii is 12 acres as compared to 8 acres in Upolu. The Rest of Upolu and Savaii Regions together account for 78 percent of the total area holding area.

5.26 Figure 6 gives Area of Holdings by Size of Holding and Figure 7 gives percentage area of holdings in each region.





Number and Area of Parcels

5.27 The average number of parcels has already been discussed in paragraph 5.14. Tables 33 and 34 give data on the number and area of parcels by size of parcel. Some 35317 parcels were recorded in the Census covering an area of 131909 acres giving an average parcel size of 4 acres as compared to 5 acres in the last census. Except in Apia Urban area and North West Upolu where the average size of the parcel was 2 acres and 3 acres respectively, the average size of the parcel in Rest of Upolu and Savaii was 4 acres.

5.28 Thirty seven percent of the parcels were in the size group of 2.00 – 4.99 acres, 22 percent were in the size group of 1.00 – 1.99 acres and another 12 percent in the size group of 10.00 – 19.99 acres. In Savaii 42 percent of the holdings was in the size group 2-4.99 acres as against 33 percent in Upolu.

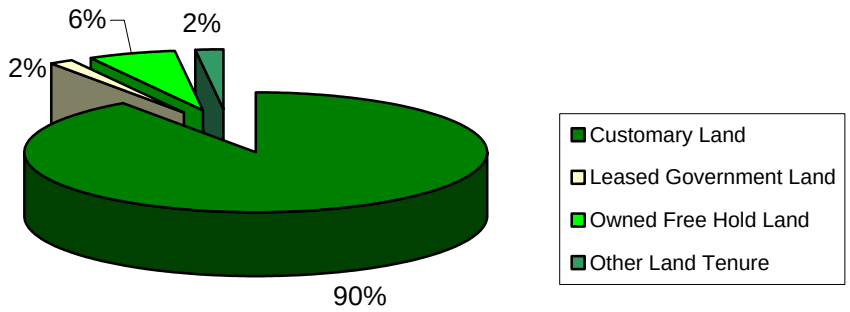
5.29 Parcel size groups of 2.00 – 4.99 acres and 20.00 acres and above, accounted for 55 percent of the land area covered by all parcels. The maximum area in Apia Urban Area (39 percent, North West Upolu and 28 percent and Rest of Upolu was in the size group of 20 acres and above, while in Savaii the maximum area was (31 percent) in the size group of 2.00 – 4.99 acres.

Land Tenure

5.30 Land is central to the economic and cultural structure of Samoa Land with productive potential not in short supply. However in areas of heavy population concentration, shortages of land under customary land tenure are becoming evident to pressure to develop land of marginal value for village sector production.

5.31 Table 35 gives area of parcels (in acres) by type of land tenure by region and district. Percentage of land area by type of land tenure is given in figure 8.

Figure 8. Percentage of Land Area, by Land Tenure, Samoa: 1999



Ninety percent of the land was under customary land tenure as against 94 in the last census. Six percent of the land was under the category of owned Free Hold Land and the remaining 4 percent under other land tenure categories.

Area of Land Under Different Land Uses

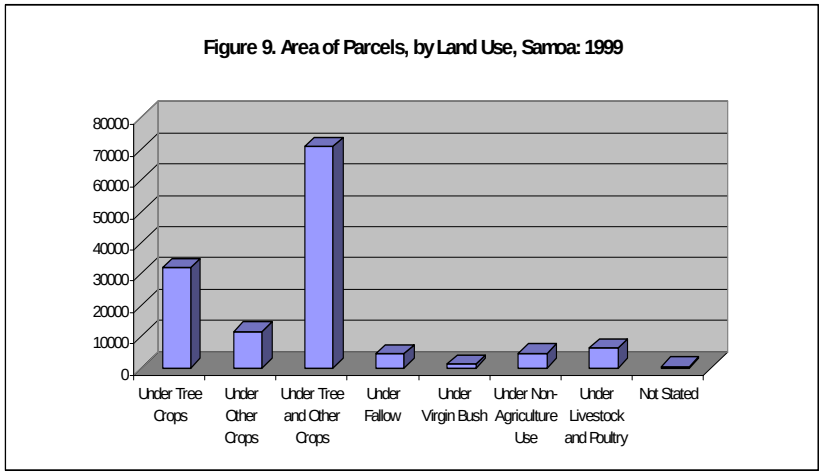
5.32 The total area of the land in holdings was classified under seven major categories of land use. (See Table 36) The percentage distribution of land under different categories in different regions is given below in Table 5.7.

Table 5.7 Percentage Distribution of Land by Major Categories of Land Use, by Region, Samoa: 1999

Region	Under Tree Crops	Under Other Crops	Under Tree/Other Crops	Under Fallow	Under Virgin Bush	Under Non-Agri Use	Under Livestock & Poultry
Apis Urban Area	14	8	56	1	-	7	14
North West Upolu	14	8	57	2	1	2	6
Rest of Upolu	25	10	46	6	1	5	7
Savaii	29	9	54	2	1	3	2
Samoa	24	9	54	3	1	4	5

For the country as a whole 54 percent of the area was in the category of under Tree and Other Crops, while 24 percent was under Tree Crops. Nine percent of the land was under other crops, Thus 87 percent of the land was under crops at the time of census. Of the land not under crops, 3 percent of the land in agricultural holdings was

classified as follow, 1 percent under Virgin Bush, 4 percent under livestock and poultry. On a regional basis 89 percent of the holding area in North West Upolu was under crops as compared 92 percent in Savaii. Figure 9 gives the area of parcels by major category of land use.



Number of Holdings Growing Crops and Main Purpose of Growing Crops

5.33 Tables 38-41 give information on the number of holdings that were growing particular crops and the purpose for which they were being grown; mainly for home consumption, partly for home consumption and partly for sale and mainly for sale. Table 5.8 shows percentage of holdings growing coconut, cocoa taro, taro palagi, taamu and yam.

Table 5.8 Percentage of Holdings Growing Crops, by Type of Crop, Samoa: 1999

CROPS GROWN	Percentage of Growing
Coconut	94
Cocoa	80
Taro native	68
Taro palagi	76
Taamu	96
Yam	81
Breadfruit	88
Cassava	35
Kava	28

As compared to last census percentage number of holdings growing taro has come down to around 70 from 93.

5.34 The Census found that most crops were grown mainly for home consumption, reflecting the subsistence nature of agriculture in Samoa. However considerable portions of certain crops are grown for sale or partly for sale such as coconut, cocoa, taro and kava. Table 5.9 gives the number of holdings reporting under each category and the percentage.

Table 5.9 Number of holdings growing the crop for a specific purpose.

Crop	Mainly for Home Consumption		Partly for Home Consumption and Partly for Home Consumption		Mainly For Sale	
	Number	%	Number	%	Number	%
Coconut	9,754	70	3,914	28	221	2
Taro native	4,670	63	2,213	29	586	8
Taro palagi	6,218	74	1,911	22	311	4
Cocoa	5,969	69	2,322	26	397	5
Banana	11,610	80	2,509	17	389	3
Taamu	7,327	66	3,229	29	493	5
Yam	6,297	73	1,901	22	433	5
kava	666	18	469	13	2,500	69

Agricultural Practices

5.35 Information on the agricultural practices like improved varieties was collected and these are given in Tables 42-49. The region wise distribution of holdings use of fertilizers by type is given in Table 5.10

Table 5.10 Percentage of Holdings Reporting Use of Fertilizers, by Type,
by Region, Samoa: 1999

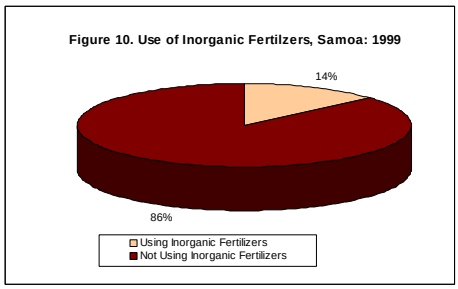
Region	Type of Fertilizers			
	Inorganic		Organic	
	% Using	% Not Using	% Using	% Not Using
Apia Urban Area	19	81	22	73
North West Upolu	14	86	12	88
Rest of Upolu	16	83	13	87
Savaii	10	90	17	83
Samoa	14	86	15	85

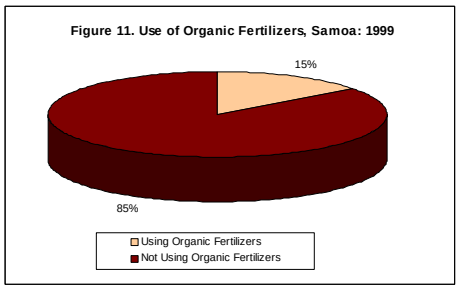
5.36 Inorganic fertilizers were used only in 14 percent of the holdings in the country. The variation in the usage ranges from 10 percent in Savaii to 19 percent in Apia urban Area. Even the use of organic fertilizers was limited to 15 percent only. It is possible that the concept of organic fertilizer has not been understood properly.

5.37 Figures 10 and 11 illustrate the national breakdown on the use of fertilizers.

Figure 10. Use of Inorganic Fertilizers, Samoa: 1999

Figure 11. Use of Organic Fertilizers, Samoa: 1999





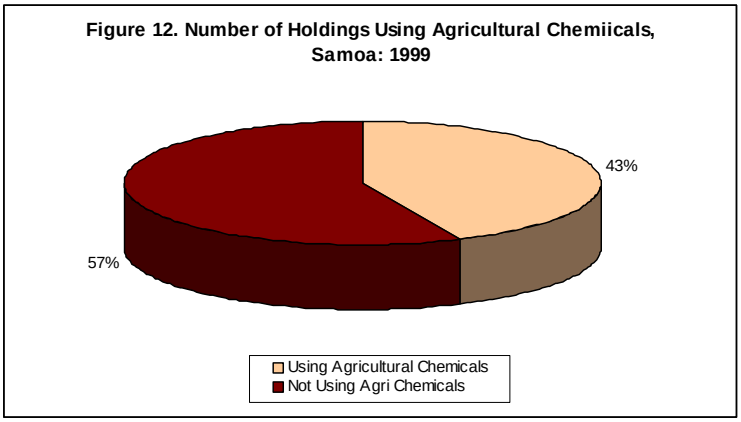
Use of Agricultural Chemicals

5.38 The region wise use of agricultural chemicals is given below in Table 5.11.

Table 5.11 Percentage Holdings using Agricultural Chemicals, by Region, Samoa: 1999

Region	Percentage of Holdings Using Agricultural Chemicals
Apia Urban Area	26
North West Upolu	44
Rest of Upolu	59
Savaii	32
Samoa	43

Figure 12 gives the number of holdings using and not using agricultural chemicals



It is seen that the use of agricultural chemicals was more popular than fertilizers. Forty three percent of the holdings were using agricultural

chemicals. It was least in Apia Urban area (26 percent) and highest in Rest of Upolu (59 percent). In Savaii it was 32 percent.

5.39 The number of holdings using agricultural chemicals by type of crop is given in Table 43. It could be seen that agricultural chemicals were mostly used on crops like Taamu, Taro, Banana. Types of chemicals used are given Tables 44-47. Herbicides were the most popular agriculture chemicals used.

5.40 Table 49 gives the number of holdings using improved varieties by type of crops. Fifty five percent of the holdings were using improved varieties of Taro crop.

Agricultural Equipment

5.41 Information on major items of equipment owned, hired and/or borrowed by agricultural holdings was collected in the census. Detailed information is given in Tables 9-11 and a summary is given in Table 5.12 next page.

Table 5.12 Equipment Owned, Hired/Borrowed, by Type of Equipment, Samoa: 1999

Type of Equipment	Number of Holdings	Number of Items Owned	Number of Holdings Hiring/Borrowing
Tractor	38	42	14
Roto Tiller	191	356	27
Copra Dryer	1,013	1,037	478
Banana Injector	1,378	1,489	342
Knapsack Sprayer	5,755	6,501	2,312
Mist Blower	468	513	185
Power Slasher	3,099	3,514	1,181
Chain Saw	1,412	1,578	480
Irrigation Water Pump	49	55	15
Electrical Generator	141	145	26
Pick-up Truck	2,246	2,643	815
Other Equipment	244	294	65

5.42 As non-agricultural households were not required to supply information on equipment owned, hired or borrowed; these figures do not represent the total number of such items in Samoa.

5.43 Knapsack sprayers followed by power slashers were the most commonly owned items of agricultural equipment. They were also the most borrowed equipment

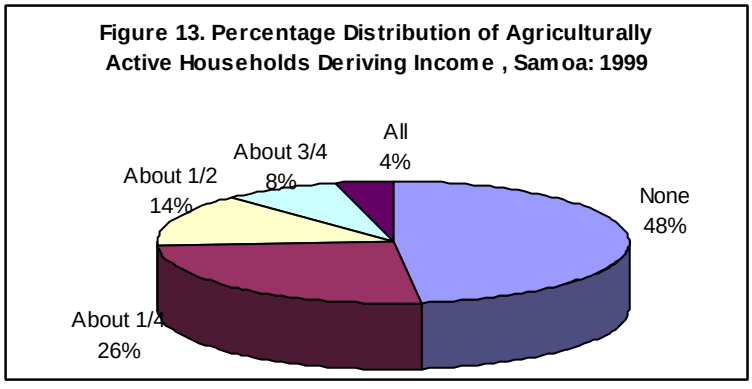
Income from Agriculture

5.44 The details of the number of agriculturally active households by proportion of income derived from agricultural activities are given in Table 26.

Table 5.13 Percentage Distribution of Agriculturally Active Households, by Proportion of Income derived from Agricultural Activities, by Region, Samoa: 1999

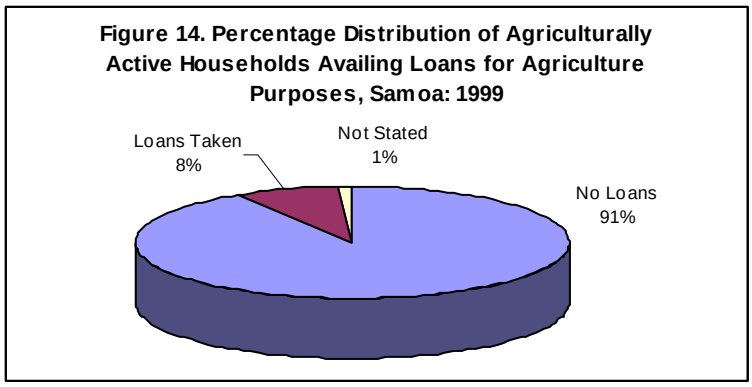
Region	Percentage				
	None	About 1/4	About 1/2	About 3/4	All
Apia Urban Area	77	10	7	4	2
North West Upolu	63	14	11	7	5
Rest of Upolu	44	32	15	7	2
Savaii	31	35	17	11	6
Samoa	48	26	14	8	4

5.45 Overall 48 percent of the agriculturally active households indicated, that they did not receive any or insignificant income from their agricultural activities. Similar figure for the last census was 26. This only shows that subsistence nature of agriculture has increased over period of time. For the country as a whole only 4 percent received all their income from agriculture. The regional variation can be seen from the above table. Seventy seven percent in Apia Urban Area received no income from agriculture, while this percentage drops to 22 in Upolu and 31 in Savaii.



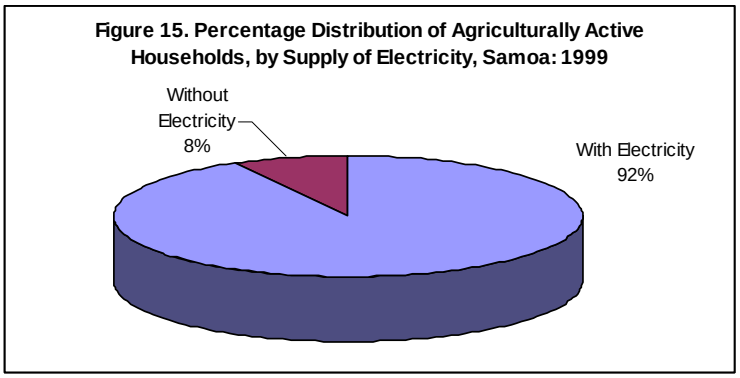
Agricultural Loans

5.46 Table 27 shows the number of agriculturally active households by the source agricultural loans. Figure 14 shows that 91 percent of the agriculturally active households did not have any such loan at the time of census. Of those households recorded as having a loan for agricultural purposes 69 percent secured their loan from the Development Bank of Samoa.



Agriculturally Active Households Supply of Electricity and Piped Running Water.

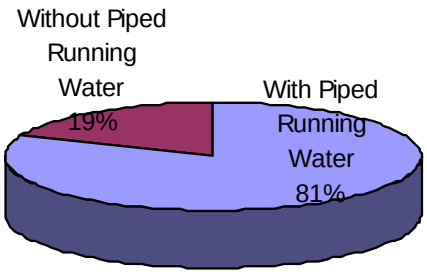
5.47 The percentage distribution of agriculturally active household with electricity is given in Figure 15. Overall 92 percent of the agriculturally active household had electricity according to the 1999 Census as compared to 60 percent in 1989.



5.48 Figure 16 gives the percentage distribution of agriculturally active households with piped running water. In Samoa 81 percent of the agriculturally active households had piped running water according to the 1999 census as compared to 78 percent in 1989. Nineteen percent of the agriculturally active households still do not have piped running water. Savaii was most disadvantaged in this respect with 24

percentage of the agriculturally active households having no piped running water.

Figure 16. Percentage Distribution of Agriculturally Active Households, by Water Supply, Samoa: 1999



Further details on access to electricity and piped running water are given in Table 28.

Sale and Consumption of Major Crops

Coconuts

5.49 Samoa's agriculture is dominated by coconut cultivation. The coconut provides a valuable source of food for both humans and livestock. It is also a source of building material and fuel as well as providing an important source of cash income through the sale of copra and coconuts. For this reason, an attempt was made in the census to collect data on consumption as well as sale of copra and coconuts. These data are presented in Table 4.

Coconuts used for Human Consumption

5.50 Ninety seven (97%) percent of the households in Samoa were recorded as using coconuts for human consumption. This high rate of coconut usage for human consumption was found to be common through out the country.

5.51 The average weekly consumption of coconuts for human consumption per household was estimated to be 49 nuts (11 drinking nuts and 38 nuts for cooking purposes). Given the average household size of 8 persons, this implies a consumption rate of 6 nuts per person per week or just one nut per person per day. Table 5.14 gives the average weekly consumption (per household) of coconuts for human consumption.

Table 5.14 Average weekly consumption (per Household) of coconuts for human Consumption, by region, Samoa: 1999

Region	For Drinking	For Cooking	Total
Apia Urban Area	7	21	28
North West Upolu	10	27	37
Rest of Upolu	11	39	50
Upolu	10	32	42
Savaii	13	48	61
Samoa	11	38	49

Typically higher rates of consumption were recorded in rural areas like Savaii, Rest of Upolu.

Coconuts used for Feeding Animals

5.52 Unlike the use of coconuts for human consumption, the percentage of households using coconuts for animal consumption varied considerably from region to region as can be seen form Table 5.15.

Table 5.15 Percentage of Households using coconuts for Feeding Animals, by Region, Samoa: 1999

Region	Percentage
Apia Urban Area	3
North West Upolu	23
Rest of Upolu	36
Upolu	62
Savaii	38
Samoa	100

5.53 In Apia Urban Area only 3 percent of the household used coconuts for feeding animals, where as it was 38 percent in Savaii and 36 percent in Rest of Upolu.

5.54 The regional variation in the average number of coconuts used for feeding animals was quite marked as can be seen from Table 5.16. This reflects the pattern of livestock population.

Table 5.16 Average weekly consumption (Per Household) of Coconuts for Feeding Animals, by Region, Samoa: 1999

Region	Average Weekly Consumption (Per Household) of Coconuts for Feeding Animals
Apia Urban Area	50
North West Upolu	54
Rest of Upolu	124

Upolu	93
Savaii	116
Samoa	102

5.55 The average weekly consumption of coconuts for feeding animals per household was estimated to 102, twice the average weekly consumption of coconuts for human consumption.

Sale of Copra

5.56 Table 4 presents data on the number of agriculturally active Households producing and selling Copra, the quantity (sacks) and the value of last sale of copra prior to the enumeration.

5.57 Some 13 percent of the agriculturally active households were selling copra in Samoa. The total value of the copra sold at the time of last sale amounted to ST $510,275.

Sale of Coconuts

5.58 The sale of coconuts is common in Samoa with 26 percent of the agriculturally active households identified as selling coconuts, both drinking and selling coconuts. However the regional variation is worthy of note. In Rest of Upolu nearly 45 percent of the households in the region sold coconuts while this percentage for Savaii was 17, North West Upolu 19 and Apia Urban Area 6 percent.

Cocoa

5.59 Cocoa is a long established crop in Samoa and has traditionally been regarded as the largest earner of export revenue. It is grown mainly on large estates but small village plantings are also commons. It is the most popular Samoan drink.

5.60 Table 5 indicates 99 percent of the households in the country consume cocoa on a regular basis. This percentage of households consuming cocoa was almost same in all the regions. The average weekly consumption of cocoa was 4 cups per household per day. While in Upolu it was 10 cups, in Savaii it was 3 cups. The District Anoamaa East recorded a weekly average consumption of 13 cups per households. As there is no standard size of a cup, these figures need to be used carefully.

Sale of Cocoa

5.61 As in the case of copra and coconuts, an attempt was made in the census to get the data on the number of agriculturally active households selling cocoa and the quantity and value of the last sale prior to enumeration. (See Table 5). Overall 20 percent of the households in Samoa reported sale of Cocoa. Regionally Savaii recorded some 27 percent of the households selling cocoa, with North

West Upolu 22 percent, Rest of Upolu 11 percent and Apia Urban Area 12 percent.

5.62 The quantity sold at the time of the last sale was recorded in local units "packets". The value of the last sale was ST231,180.

Banana

5.63 Banana is a major item of food both in villages, where it is grown and also in Urban Area (mainly Apia). In the past large quantities were exported. As in the case of coconuts and cocoa, data on consumption and sale was collected in the census of Agriculture 1999 and presented in Table 6.

Consumption of Banana

5.64 Like coconut Banana was consumed by almost all households in Samoa. Similar was the position in all the regions. The average weekly consumption of Bananas per household in Samoa was three bunches, while it was 8 bunches in Upolu and 3 bunches in Savaii.

5.65 The value of the last 'sale' was ST455,976. Seventy six percent of the value of the sale was from Upolu and 24 percent from Savaii. While North West-Upolu contributed to 41 percent of the total value of last sale, Rest of Upolu accounted for 27 percent and Apia Urban Area 8 percent.

Taro

5.66 Taro is the most important staple food crop of Samoa and used to be good export earner. Taro Blight in mid 1993 caused havoc to this crop and therefore this crop has not recovered to the level of 1989. As in the case of coconut, cocoa and Banana, data on consumption of sale of taro was collected and presented in Table 7. The data was collected both for local taro and taro palagi.

Consumption of Taro

5.67 Data on consumption of taro was collected separately for local taro and taro palagi. For the country as a whole the percentage of population consuming native taro was 49 percent, while for taro palagi the percentage was 85.

5.68 This was mainly due to higher prices of native taro and short supply. The weekly average consumption of native taro per household was 13 pieces in Samoa. In case of taro palagi the average weekly consumption was two baskets.

Sale of Taro

5.69 Sale of Taro is considerably reduced. The percentage of agriculturally active households selling native taro was only 17 percent. This percentage in respect of taro palagi was 16 percent. The value of 'last sale' of native taro prior to enumeration was ST $614,426. Sixty five percent of the total value of the last sale' was contributed by Upolu and the remaining 35 percent by Savaii. Table 5.17 gives separately the percentage contribution to the total value of last sale.

Table 5.17 Percentage Contribution to the Total Value of Last Sale Prior to Enumeration, by Region, Samoa: 1999

Region	Native Taro	Taro Palagi
Apia Urban Area	2	9
North West Upolu	10	40
Rest of Upolu	53	34
Savaii	35	17
Samoa	100	100

5.70 Bulk of value of the "last sale" of Taro Palagi was from Upolu (83 percent) and the remaining 17 percent coming from Savaii. Bulk of the sale of taro palagi was reported from North West Upolu, while for taro native it was Rest of Upolu.

Taamu Consumption

5.71 Taamu also known as the giant taro is becoming more popular in view of higher prices of taro and its short supply. The area under taamu is going up. As in the case of coconuts, cocoa, banana and taro, data on consumption and sale of taamu was collected and presented in Table 8.

5.72 Ninety nine percent of the households reported the consumption of taamu. This percentage was same for all regions. The weekly average consumption per household was 6 pieces. It was 4 in Upolu and 8 in Savaii. The consumption varied from District to District.

Sale of Taamu

5.73 Twenty three percent of the households for the country as a whole reported the sale of taamu. The percentage of households, which sold taamu, was 51 percent in Savaii, 29 percent in Rest of Upolu, 18 percent in North West Upolu and only 2 percent in Apia Urban Area.

5.74 The total value of the last sale prior to enumeration was ST994,676. The contribution to this value was 51 percent from Upolu and 49 percent from Savaii. The Rest of Upolu, North West of Upolu and Apia Urban Area accounted for 35 percent 14 percent and 2 percent, respectively.

Agricultural Worker

Unpaid Agricultural Labour

Age/Sex Distribution

5.75 Table 19 shows the number of persons working in an unpaid capacity on the holdings during the month prior to enumeration by sex and age group. As majority of unpaid workers were household members, no separate breakdown is shown by household membership status. Seventy nine percent of the unpaid workers were males and the remaining 21 percent females. Sixty five percent of the unpaid workers were in the age group of 20-39.

Employment Status

5.76 The employment status of unpaid workers is shown in Table 20. Eighty seven percent of the unpaid workers had no paid full time job. Only 9 percent had full time paid job and 4 percent part time paid job. While 22 percent of the unpaid workers had full time job in Apia Urban Area, these percentages in respect of North West Upolu, Rest of Upolu and Savaii were 9, 12, and 5 respectively.

The average number of hours worked by unpaid workers on the holding during the month prior to enumeration was 63 hours.

Paid Agricultural Labour

5.77 Tables 22-23 presents the details of the number of persons who worked in a paid capacity on the holdings, the average hours worked and the averages wages received during the month prior to enumeration. Out of the total workforce of 26000, 56 percent were operators, 39 percent were unpaid workers and 5 percent paid workers. Out of the 1366 paid workers, only 77 were females. Sixty percent of the paid workers were in the age group of 20-39 years. The average hours worked by the paid worker per month was 59 and the average wage received was ST 135 or an hourly rate of ST2.30.

Area Under Crops

5.78 Tables 50 – 64 give information on crops grown in plots. The information relating to crop areas is presented in two ways, the actual physical area under the crops (which includes double counting in the case of mixed and scattered crops) and the 'Single Crop Equivalent Area' (SCE) which attempts to eliminate this double counting. The

reader should note that this information was collected from a 25 percent sample of holdings and is presented at the regional level only. It should also be noted that in some instances the detail does not add to the total due to rounding.

5.79 For purpose of area estimation, information on crops was collected by method of cultivation. A crop could be grown as:

(1) a 'pure crop i.e. the plot was under single crop cultivation.
(2) a 'mixed' crop i.e. the plot was under mixed crop cultivation
(3) a 'scattered' crop i.e. the crop was planted in small quantities in a non-uniform planting pattern

5.80 In the case of a 'pure' crop the area and the SCE area are the same. Information on the number of plots under this method of cultivation for each of the main crops is shown in Table 50 and the area estimates in Table 51.

5.81 In the case of 'mixed' crops, the area under the crop mix is counted for each crop the crop mix. To overcome this double counting, the SCE area takes into account the crop mix and apportions the total area between the crops in the crop mix thus avoiding double counting. The concept of single crop equivalent (SCE) area refers to the area the crop would have covered if it had been planted on single crop basis. For example, if a plot of land has one acre under taro and taamu sown in the ratio of 3:1 the area for both taro and taamu would be one acre whereas the single crop equivalent area would be three quarters of an acre for taro and one quarter of an acre for taamu. Information on the number of plots under mixed crop cultivation is shown in Table 59 and on the area under these crops in Table 60 (both these tables include double counting). Table 54 gives the estimates of the SCE area after taking into account the crop mix ratios and apportioning the plot areas between the crops.

5.82 Tables 59 and 60 give further information on the number of plots and the areas of the major crops found in Samoa.

5.83 In the case of 'scattered' crops, the number of plants/trees was recorded. The actual area under such crops should be interpreted with care since it can include large areas of land with only one or two scattered trees on them. The SCE area for scattered crops was calculated using crop density factors (see annex 4) to convert the numbers of plants/trees to acres. Tables 55-58 present information on the number of plots recorded as containing scattered crops, the area of these plots, the estimated number of scattered plants/trees and the estimated SCE area.

5.84 Information on the age of the two major tree crops (coconut and cocoa) was also recorded for trees planted either as a 'pure' or 'mixed' crop. This information is presented in Tables 61 and 62.

5.85 In order to be able to estimate annual acreage, information was also collected on crops that had been planted during 1999 and already

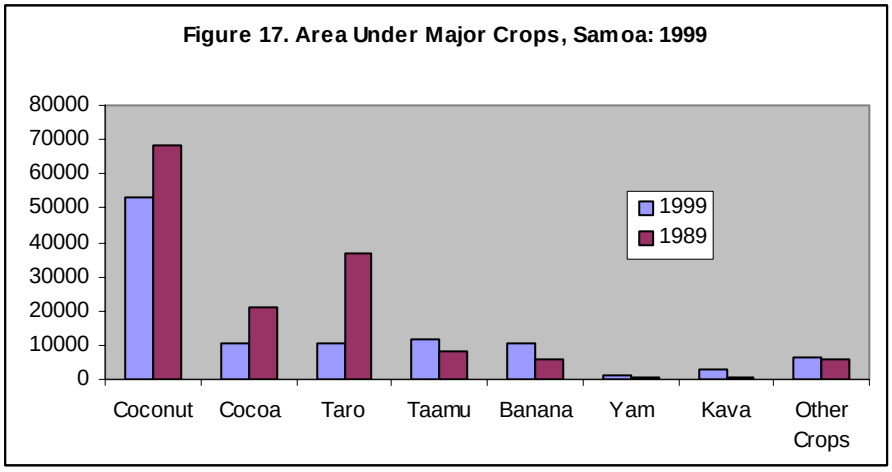
harvested by the time of the enumeration (see tables 63 and 64). This information was of particular importance in the case of seasonal crops such as vegetables, which are mainly grown during the cool season (April-October) which might not otherwise have been recorded in the Census. Table 5.18 gives the estimates of area for major crops.

Table 5.18 Single Crop Equivalent Area of Major Crops, Samoa: 1999

Crop	Area in Acres Household Sector	Total Area In Acres
Coconut	46,300	53,200
Cocoa	9,900	10,400
Taro	10,500	10,500
Taamu	11,900	11,900
Banana	10,700	10,700
Yam	1,300	1,300
Kava	3,000	3,000
Other Crops	6,700	6,700
Total	100,300	107,700

5.86 In the non-household sector that is WSTEC, churches etc very little area was under taro, taamu yam or other vegetable crops. The important findings in respect of some of the major crops are discussed below.

Figure 17 gives the area under major crops grown in 1999 comparative figures for 1989 are also given.



Coconut

5.87 Out of the 53,200 acres in Samoa in 1999, 46300 acres i.e. 87 percent was recorded in holdings under the household sector with remaining 6900 acres under the non-household sector. As compared to 1989 Census there was a drop of 15100 acres i.e. 22 percent under coconut.

As explained earlier, the two cyclones in 1990 and 1991 heavily damaged the coconut plantation and the recovery is slow.

The distribution of coconut area by region in the household sector in 1999 and 1989 is shown in Table 5.19.

Table 5.19 Distribution of Coconut Area(Household Sector only), by Region, Samoa: 1999

Region	Coconut Area		Percent	
	1999	1989	1999	1989
Apia Urban Area	500	1,000	1	2
North West Upolu	8,400	4,200	18	7
Rest of Upolu	17,200	25,200	37	44
Upolu	26,100	30,400	56	53
Savaii	20,200	27,100	44	47
Samoa	46,300	57,500	100	100

5.88 This table shows that 56 percent of the area under coconut was in Upolu and 44 percent in Savaii in 1999. As compared to 1989 Savaii was comparatively very badly affected by the two Cyclones resulting in a drop of 6900 acres (25 percent) under coconut.

5.89 The 1999 Census shows that 60 percent of the coconut area was grown as a single (pure) crop, 28 percent of the area grown as mixed crop and 12 percent as a scattered crop.

5.90 The average size of a plot containing coconut grown as a single crop (pure) was 3 acres as compared to 4 in the last Census. In terms of area under coconut grown as mixed crop, coconut and cocoa were the most important crop mixture . However other crops like banana, taro and taamu were also commonly grown with coconut as mixed crop (see Tables 59 and 60).

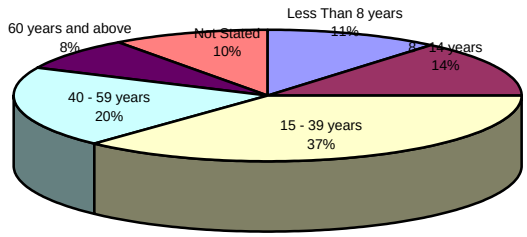
5.91 The age distribution of coconut trees is given in Table 61, summarized in Table 5.20 and illustrated in Figure

Table 5.20 Percentage Distribution of Coconut Trees by Age Group (Household Sector only), Samoa: 1999

Age of Trees (In Years)	Percent
Not Stated	10
Less Than 8 years	11
8 to 14 years	14
15 to 39 years	37
40 to 59 years	20
60 years and over	8

5.92 Excluding the 'not stated" (due to mainly mixed age groups) 57 percent of the coconut trees were in their main bearing years (15-59), 8 percent were classified as senile (60 years and over) and 25 percent as pre bearing (0-14 years)

Figure 18. Percentage Distribution of Coconut Trees (Household Sector Only), by Age Group Samoa: 1999



Cocoa

5.93.1 The area under cocoa in the household sector was estimated to be in the order of 9900 in 1999. Census as against 16200 in 1989 census I.e. 6300 acres (39 percent) less. Area under informal sector was reported to 4600 acres in 1989. In the 1999 Census the reports received from the institutions so far show an area of only 500 acres. Thus the total area under cocoa in the current Census is 10,400 acres as against 20,800 acres in the last census. The major decline in Cocoa area is attributed to a marked decrease in areas operated by Samoa Trust Estate (4,500acres in 1989 coopered to 500 acres in 1999).

The analysis of the data of area under cocoa is therefore limited to the household sector only. The distribution of area under cocoa in the household sector as estimated from the census of Agriculture 1999 and 1989 are given in Table.

Table 5.21 Distribution of Cocoa Area in Acres (Household Sector only)

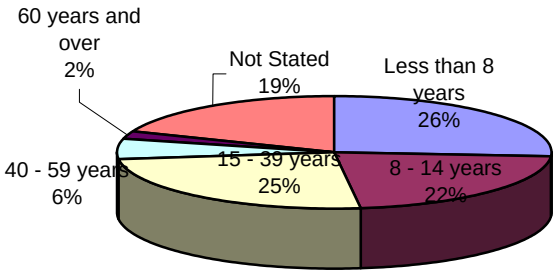
Region	1999	%	1989	%
Apia Urban Area	100	1	300	2
North West Upolu	2,100	21	2,900	18
Rest of Upolu	2,000	20	3,100	19
Upolu	4,200	42	6,300	39
Savaii	5,700	58	9,900	61
Samoa	9,900	100	16,200	100

5.94 The area under cocoa in the household sector has gone down by 6,300 acres in 1999 i.e. 40 percent as compared to 1989. The decline in Upolu was 2100 acres (33 percent) and in Savaii it was about 4200 acres i.e. about 42 percent. An in-depth study will have to be undertaken to study the reasons for this sharp decline in the area.

5.95 The census found that 40 percent of the area under cocoa was grown as single crop (pure) and 53 percent in mixture with other crops. Seven percent of the area was under scattered cocoa trees. The average size of the cocoa plot under single crop cultivation was 1.5 acres as against 2.5 acres in the last census. As a mixed crop, the dominant mix was cocoa and coconut but cocoa was also found to be widely grown with banana and taro.

5.96 Information on age distribution of the cocoa trees in the household sector is given in Table 62. As with coconuts nearly 19 percent were not classified probably due to trees of mixed age on the same plot. Excluding these 'not stated' 26 percent of the cocoa trees were less than 8 years, 22 percent 8-14 years, 25 percent 15-39 years, 6 percent 40-59 years and 2 percent 60 years and over. The distribution of age group is illustrated in Figure 19.

Figure 19. Percentage Distribution of Cocoa Trees, by Age Group, Samoa: 1999



Taro

5.97 The estimated area under Taro as per 1999 Census in the household sector was 10500 acres, out of which 6,600 acres was under native taro (63 percent) and 3900 acres (37 percent) under taro palagi. As compared to the last Census taro area has decline by 26000 acres i.e. 71 percent. The Taro Blight in mid 1993 almost washed away the entire crop and since then, the farmers seem to have shifted the area under taro to taamu and banana. Honorable Minister of Agriculture, Forests and fisheries stated the following at the 22nd F.A.O Regional conference for Asia and the Pacific "No estimates are available regarding the areas presently planted with substitute crops such as bananas and taamu, but the general observation has been that bananas and taamu are now growing where taro grew before" The Census data indicates that the area under Taro has gone down and the area under Taamu and Banana have gone up.

The distribution of area under taro by region for 1999 and 1989 censuses is given below in Table 5.22.

Table 5.22 Distribution of Area (Acres) under Taro, by Region, Samoa: 1999

Region	1999	%	1989	%
Apia Urban Area	400	4	800	2
North West Upolu	1,900	18	3,800	11
Rest of Upolu	4,200	40	17,400	48
Upolu	6,500	62	22,100	61
Savaii	4,000	38	14,500	39
Samoa	10,500	100	36,500	100

5.98 The pattern of distribution of area under taro in Upolu and Savaii was almost same in both censuses. With in Upolu there was variation in the distribution of area between the two Censuses.

5.99 In absolute terms the area declined in all the regions. For the country as a whole the percentage decline was 71%. In Rest of Upolu it was 76 percent and in Savaii 72 percent.

5.100 Some fifty three percent of the taro crop (growing at the time of census) was found to be planted as a single crop (pure) and 45 percent as mixed crop and 2 percent as scattered crop. The average size of the taro plot planted as a single crop (pure) was 1.2 acres. In terms of taro grown as mixed crop, taro – taamu was far the most popular mix.

The area harvested by the time of census was only 650 acres.

Area under Taamu

5.101 One redeeming feature of Samoan agriculture since the last two cyclones of 1990 and 1991 and Taro Blight in mid 1993, is that the areas under taamu, banana and yam have gone up. They have become substitute crops for taro. The area under taamu in 1999 census was estimated to be 11900 acres as against 8100 acres, or an increase of 3800 acres or 47 percent. The distribution of the area under taamu by region is given in Table 5.23.

Table 5.23 Distribution of the Area (Acres) Under Taamu by Region, Samoa: 1999 and 1989

Region	1999	%	1989	%
Apia Urban Area	300	3	300	3
North West Upolu	2,100	18	1,300	16
Rest of Upolu	3,700	31	1,900	24
Upolu	6,100	51	3,500	43
Savaii	5,800	49	4,600	57
Samoa	11,900	100	8,100	100

5.102 Out of the 11900 acres under taamu 51 percent was in Upolu and 49 percent in Savaii. Except Apia Urban Area, the rest of the regions showed an increase in area under taamu as compared to the last census. The percent increase in area under taamu was highest (95) in Rest of Upolu. In North West Upolu and Savaii, the percentage increases were 61 and 26 respectively. There was thus a clear indication that taamu is becoming a substitute crop for taro. Forty six percent of area under taamu was grown as mixed crop mainly with taro.

Banana

5.103 The total area under banana in the household sector was estimated to be 10700 acres. The distribution of area under banana by region is given in Table 5.24.

Table 5.24 Distribution of Area under Banana, by Region, Samoa: 1999 and 1989

Region	1999	%	1989	%
Apia Urban Area	600	6	500	9
North West Upolu	2,700	25	1,700	30
Rest of Upolu	3,400	32	1,900	34
Upolu	6,700	63	4,100	73
Savaii	4,000	37	1,500	27
Samoa	10,700	100	5,400	100

5.104 There was a 98 percent increase in area under banana in 1999 as compared to 1989. There has been a shift in the acreage from taro to banana after the taro blight in mid 1993. The area under banana has increased in all the regions. There is a 63 percent increase in Upolu and 166% in Savaii. About 43 percent of the banana were grown as pure, 41 percent as mixed crop and the remaining 16 percent as scattered crop.

Kava

5.105 The total area under kava was 3000 acres in 1999 as compared 600 acres in 1989 an increase of 2400 acres.

Yam

5.106 The area under yam has also increased. It was 600 acres in 1989. In 1999 it was estimated to be 1300 acres, an increase of 700 acres.

Other Root Crops

5.107 Amongst the staple root crops, taamu has now become the most important crop (11,900 acres) followed by taro (10,700 acres) and banana

(10,700 acres). The other three major root crops widely grown in the Pacific Region were not found to be growing in large quantities in Samoa, yam and cassava (300 acres).

Vegetables

5.108 A wide variety of vegetables like egg plant, bean, cucumber, head cabbage Chinese cabbage, pumpkin, lettuce, tomato and fruits are grown in Samoa and the areas under these crops can be seen in table 90F.

Tree Crops (other than coconut and cocoa)

5.109 With the exception of coconut and cocoa, in case of tree crops grown in Samoa area is not the most appropriate measure, since most trees are grown in a scattered manner. Therefore the number of trees in respect of major trees crops have been worked out and given in Table 5.25

Table 5.25 Estimated Number of Scattered Trees, Samoa: 1999

Crop	Number of Trees
Breadfruit	89,000
Papaya	37,000
Mango	7,000
Orange	3,000
Lemon	2,000
Lime	2,000
Coffee	2,000
Avocado	1,000

5.110 Breadfruit is the most important crop in Samoa. In times of crisis like the two cyclones, breadfruit provided a major source of food to many people in the country.

Other Crops

5.111 A wide variety of other crops are also grown in addition to the crops mentioned earlier and information on these crops can be seen in the crop tables.

Livestock in Samoa

5.112 Livestock plays an important role in the economy of Samoa. The opportunity provided by the Census of Agriculture was utilized to collect numbers of livestock of important species both from agricultural and non-agricultural households. Unlike in 1989, the 1999 census included not

only the number of livestock kept as of the day of enumeration but also data items on the number of animal slaughtered and sold alive during the reference period. The results are summarized in fourteen tables (Tables 65 to 78). It should be noted that, as with the other census tables presented in this report, the livestock data relate to the household sector only. The numbers of livestock in the non-household sector are given separately at the end of this chapter.

Number of Households Keeping Livestock

5.113 The percentage of households keeping livestock by type of livestock in the different regions is given in Table 5.26.

Table 5.6 Percentage of Households Keeping Livestock, by Type of Livestock, by Region, Samoa: 1999

Region	Type of Livestock							
	Any Types Of Livestock	Cows & heifers 2 yrs & over	Bulls & Steers 2 yrs & over	Other Cattle	Pigs	Chickens	Goats	Horses
Apia Urban Area	99.8	6.5	5.6	2.6	56.1	78.4	0.7	1.3
North West Upolu	99.9	5.0	4.5	2.2	67.8	87.0	0.7	4.0
Rest of Upolu	99.9	21.2	15.8	10.9	84.3	92.3	1.0	8.1
Savaii	100.0	28.1	18.4	9.3	89.5	93.5	0.7	8.5
Samoa	99.9	16.8	12.1	6.8	77.3	89.3	0.8	6.1

5.114 Almost all the households in Samoa kept some type of livestock. The most popular type of livestock raised was chickens with 78 percent of all households recorded as keeping chickens followed closely by pigs with 56 percent of households recorded as keeping pigs.

Total Livestock

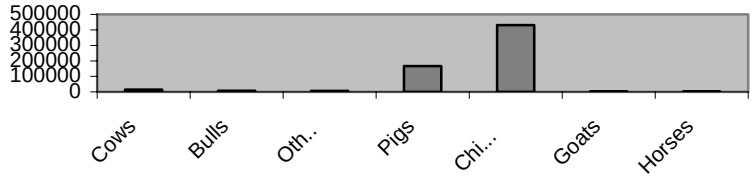
5.115 Table 5.27 shows the numbers of livestock kept by households by type of livestock for the four regions of Samoa and this is graphically portrayed at the national level in Figure 20. The Census recorded some twenty-eight thousand (27,883) cattle, one hundred and sixty-seven thousand (167,316) pigs, four hundred and thirty-one thousand (431,090) chickens, two thousand (1,993) goats and two thousand (1,799) horses.

Table 5.27 Number of Livestock Kept, by Type of Livestock, by Region, Samoa: 1999

	Types of Livestock

Region	Cows & heifers 2 yrs & over	Bulls & Steers 2 yrs & over	Other Cattle	All Types of Cattle	Pigs	Chickens	Goats	Horses
Apia Urban Area	1798	1168	550	3516	9305	52353	180	62
North West Upolu	2432	1036	852	4320	29191	121936	550	362
Rest of Upolu	4793	2388	2762	9943	61403	124000	1009	614
Savaii	5519	2587	1998	10104	67417	132801	254	761
Samoa	14542	7179	6162	27883	167316	431090	1993	1799

Figure 20. Number of Livestock Kept, by Type of Livestock, Samoa: 1999



Cattle

5.116 Of the 28,000 cattle recorded in the household sector, 64 percent were in Upolu and the remaining 36 percent in Savaii. Of the total cattle, 52 percent were classified as cows and heifers two years and over and 26 percent as bulls and steers two years and over with the remaining 22 percent are young stock.

5.117 The districts of Vaimauga West in Apia Urban Area recorded the largest number of cattle accounting for 15 percent of the total cattle in Upolu Island. Faleata West (11%), Safata (11%) and Falealili (9%) were next in ranked in terms of the number of cattle kept.

5.118 In Savaii, the district of Palauli Le Falefa, Faasaleleaga I and Palauli East recorded more than a thousand cattle accounting for 34% of the total cattle in Savaii.

5.119 Tables 67 gives the inventory of the number of cattle kept as of time of visit, slaughtered and sold live during 1999. There were about 6,000 cattle slaughtered in Samoa during 1999, of which 38% were sold, 54% were used for faalavelave (funerals, weddings, saofai, etc) and 7% were consumed by the households. It is interesting to note also that less than a thousand cattle were sold live in 1999.

5.120 Table 68 gives the details of the number of households keeping cattle and the number of cattle by location of household and by size of cattle holding. Overall, some 6,000 households were recorded as keeping cattle and the average size of a cattle holding was 5 animals.

Pigs

5.121 Pigs are traditionally important in the village life of Samoa. They are generally considered to be the most prestigious offering on ceremonial occasions and most are kept for this purpose. Of the 167,316 pigs recorded in Samoa at the time of the Census (household sector only), 60 percent were in Upolu and the remaining 40 percent in Savaii. Of the 100,000 pigs in Upolu, 61 percent were recorded in the Rest of Upolu Region, 29 percent in the North West Upolu Region and 9 percent in the Apia Urban Area.

5.122 For the country as a whole, the average number of pigs per household keeping pigs was 14. In Upolu, the average was 12 compared to 15 in Savaii. Within Upolu the average varied from only 7 pigs per household in the Apia Urban Area to 12 pigs per household in the Rest of Upolu Region.

5.123 Aside from the number of pigs kept as of the time of the census, there were about 55,000 pigs slaughtered in Samoa in 1999. Of these, 50% were consumed, 43% were used as faalavelave and the rest were sold live. Between the two islands, Upolu had the biggest percentage of consumption of pigs (56%) and pigs used for faalavelave (57%). But among the regions, the biggest consumers of pigs are the residents of Savaii (44%).

Chickens

5.124 Chickens also play an important part in the traditional faalavelave or traditional ceremonies although they are not as prestigious as pigs. The greatest portions of the chickens are therefore consumed at the traditional festivities. Of the total 431,000 chickens in Samoa, 69 percent were in Upolu and the remaining 31 percent in Savaii.

5.125 The average size of a chicken holding was 30 chickens. There was virtually no variation between the regions indicating that even in the more densely populated areas, households manage to keep as many chickens as rural households do.

5.126 The number of slaughtered chickens in Samoa in 1999 totaled to 119,000. These were sold (4%), consumed (65%) and given away as gifts or offering (31%). More household in Upolu (68%) than in Savaii (32%) consumed chicken. Region wise, Rest of Upolu and Savaii had almost the same percentage of consumption of chicken, about 20%. In terms of live chicken sold, the census recorded about 12,000 chickens.

Goats

5.127 Goats were first introduced into Samoa during the German Administration. At the time of the 1999 Census, 1,993 goats were recorded in the household sector in Samoa with 254 in Savaii and 1,739 in Upolu. The average number of goat kept was 16 animals. The largest goat herd was recorded in the Rest of Upolu Region (1,009).

Horses

5.128 A total of 1,794 horses were recorded in Samoa at the time of the Census, out of which 42% were in Savaii and 58% in Upolu. Savaii and Rest of Upolu Regions reported significant numbers of horses (761 and 614 animals, respectively). The households in the Apia Urban Area only recorded some 62 horses.

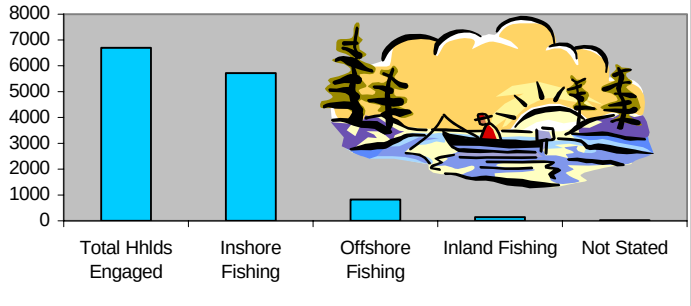
5.129 About 6% percent of the households were keeping an average of 2 horses only. While a few households reported to have sold around 32 horses in 1999.

FISHERIES

Households Engaged in Fishing

5.130 Aside from the presence of rich agricultural lands, Samoa is also blessed with fishing grounds abounding with different kinds of fishes and other aquatic products. One-third of the total households residing in this island was engaged in fishing during the reference period. Of these households, 92% were agriculturally active, which means these households are both farming the lands and fishing in the seas.

Figure 21. Number of Households Engaged in Fishing, by Type of Fishing Activity, Samoa: 1999



Type of Fishing Activities

5.131 Nine out of ten households were fishing in the inshore waters, which implies that fish and other sea products can be found even in the nearby shore of the island. About twelve percent (12.4%) of the fishing households ventured in the offshore or deep-sea fishing. Only 2% used the resources of the inland water or river.

5.132 More households in Upolu (3 out 10) than in Savaii (2 out of 10) were engaged in fishing during the reference period. These households (32.3%) could be found mostly in the Rest of Upolu region.

Table 5.28 Number of Households Engaged in Fishing, by Type of Fishing, By Region, Samoa: 1999

Region	All Types	Inshore Fishing	Offshore Fishing	Inland Fishing	Not Stated
Samoa	6,669	5,718	824	140	17
Upolu	4,149	3,592	421	125	11
Apia Urban Area	385	226	139	19	1
North West Upolu	1,119	1,030	135	24	10
Rest of Upolu	2,565	2,336	147	82	0
Savaii	2,560	2,126	403	15	6

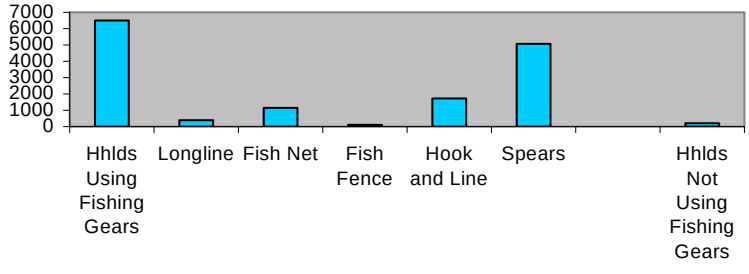
Type of Fishing Gears

5.133 Fishing gear is a gadget for catching or trapping fish and other aquatic products. A household engaged in fishing may or may not use a fishing gear.

5.134 97% of the households engaged in fishing during the reference period used fishing gears, Of these households, 4 out 5 used spears. The other fishing gears, which the households preferred to use, were hook and line (3 out of 10 fishing households) and fish net (1 out of 5 fishing households).

5.135 Longline was also another fishing gear used by about 6% of the fishing households. A few households (2%) built fish fence, a different type of fishing gear used for trapping the fish.

Figure 22. Number of Households Engaged in Fishing, Using and Not Using Fishing Gears, by Type of Fishing Gears, Samoa: 1999



Type of Boats

5.136 Aside from fishing gear, a household may also use boat while catching fish. During the reference period, it was reported that more fishing households (69.2%) did not own or hire any fishing boat.

5.137 About thirty two (32.2%) percent of fishing households owned and/or hired non-motorized boats compared to about three percent (3%) who own and/or hire motorized boat.

5.138 The number of owned boats totaled about 2,200; ninety one percent (91%), of which are non-motorized and the rest are motorized.

Average Number of Fishing Trips

5.139 Of the total households engaged in fishing, 97.4% reported their average number of fishing trips during the last week prior to the enumeration. On average, these households went fishing for three trips during last week. Those engaged in inshore fishing and offshore went on the average of three trips.

Proportion of Catch Sold

5.140 Seven out of ten households engaged in fishing did not sell any of their catch. On the other hand, those selling their catch are divided into four categories. About 31% of these households sold about ½ of their catch; 29% sold about ¼ and another 24% sold about ¾. Only one in every five of these households sold all the fishes and other aquatic products that they caught from the sea and/or river.

Household Members Engaged in Fishing

5.141 The household members normally engaged in fishing during the reference period totaled to 10,143. On average two (2) members of fishing households are normally engaged in fishing. There were more male members (86%) engaged than female members (14%).

Main Purpose of Fishing

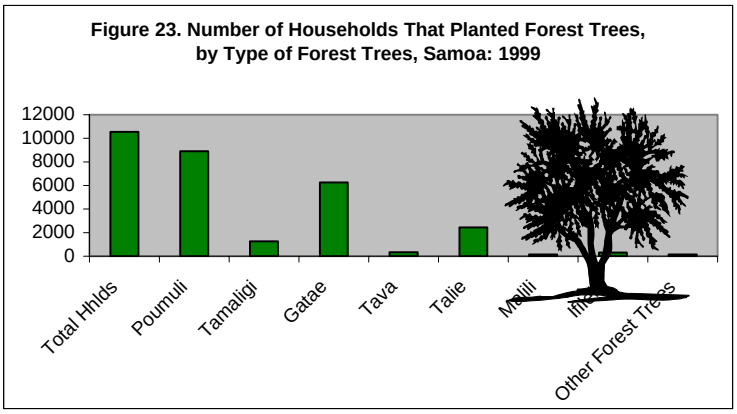
5.142 The main purpose of seven in every ten households engaged in fishing was for their home consumption only. About one-fifth of the households went fishing mainly for home consumption but they occasionally sold some of their catch. Others reported their intention was mainly to sell (5%) all their catch. A few households (1%) had members who were employed in fishing.

FORESTRY

Households That Planted Any Forest Trees

5.143 Seventy one percent (71.3%) of the households that planted forest tree were from Upolu, particularly from North West Upolu, where nine out ten households planted poumuli, three out of five households planted gatae and about ten percent planted other forest trees. For Savaii residence, three out ten households, planted forest trees of which eighty three percent (83%) planted poumuli, sixty two percent (61.5%) plant gatae and thirty seven percent (36.7%) planted talie.

Figure 23. Number of Households That Planted Forest Trees, by Type of Forest Trees, Samoa: 1999



5.144 It is interesting to note that about 800 to 900 households from Faleata West (876) of North West Upolu and Vaimauga West (798) of Apia Urban Area had grown different kinds of forest trees compared to the other villages nearby.

Uses of Forest Trees

5.145 Forest trees are good in building houses and fences. It can be used also for handicrafts, firewood for cooking and other purposes. About eighty eight percent (87.5%) of the households had planted forest trees for building houses. Three out of five of them intended to use these trees for fencing their houses or their farms. While some households (16%) utilized these forest trees as firewood and a little less than 5% made them into beautiful handicrafts. Still others used these forest trees as shades and something that can beautify their homes.

5.146 To have a better view of the actual number of households that planted trees for a specific use, refer to Table 5.29. The table shows that most of the households (97%) that grew poumuli uses it for building houses. Gatae is used mostly for fencing, while ifilele is used mainly for handicrafts.

Table 5.29 Number of Households That Planted Trees, by Type of Forest Trees, By Uses of Trees, Samoa: 1999

Type of Tree	Total	Fale	Pa	Fafie	Meataulima	Isi
Total	10,546	9,238	6,712	1,638	449	1,813
Poumuli	8,910	8,667	197	8	1	37

Tamaligi	1,273	44	437	611	39	142
Gatae	6,258	97	5,424	37	14	686
Tava	336	56	36	200	14	30
Talie	2,445	199	583	602	207	854
Malili	155	33	8	70	36	8
Ifilele	322	76	11	97	126	12
Others	151	66	16	13	12	44

Post Enumeration Check

5.147 The post enumeration check based on actual measurement of areas in case of 206 parcels was done by the staff of the Department of Statistics. The results of the Post Enumeration check are given below.

Region	No. of Parcels	Area (acres) as Reported by Respondents	Area (acres) Based from Objective Measurement	% Difference
Upolu	97	309.25	347.83	11
Savaii	109	494.38	449.81	10
Samoa	206	803.63	797.64	0.75

5.148 Although the sample is small as can be seen from the percentage of parcels covered (0.6%), the overall reported area by respondents is more by 0.75 percent. While in Upolu, the respondents estimate less by 11 percent, in Savaii it is more by 10 percent. The post enumeration check gives only an indication of the magnitude of variation between the respondent's estimate of the area and actual measurement.

5.149 Land in the Non-Household Sector

The Census covered only the household sector. However data from the most important institutions such as WSTEC, Churches, Government departments and non government organizations were collected separately.

5.150 Livestock in the Non Household Sector

The number of livestock and Poultry in the non household sector is given in Table 5.31

Table 5.30

Livestock and Poultry in the Non Household Sector

Kind of Livestock/Poultry	Number Kept	**Slaughtered in 1999**			Number of Animals Sold Live
		Sold	Consumed	Faalavelave	
Cows & Heifers 2 yrs &	900	89	10	32	25
Bulls and Steers 2 yrs &	250	16	9	3	8
All other cattle	80	165			10
Total Cattle	1230				
Horses	8				
Pigs	400	20	19		30
Goats					
Chickens					
Other (specify)					
Honey Bees	2 Hives				

Chapter II
AGRICULTURE AND LAND TENURE SYSTEM IN SAMOA

FARMING SYSTEMS

2.01 Samoa's farming systems are characterized by closely independent production activities that cut across the crops, livestock, fisheries and forestry sub-sectors. The food crops sector is dominated by production of root crops, which are produced in sufficient quantities to ensure adequacy of carbohydrates for the people. The requirements of carbohydrates are augmented by banana and breadfruit production. Coconut, which provides an important source of food and cash, is the predominant crop.

2.02 The production base is however narrow, being confined to a few root crops, Vegetables and fruits that are grown haphazardly on a small scale, plus coconuts and cocoa grown as cash crops. A distinct dichotomy exists in the systems of management of the crops sub-sector – the dominant subsistence sector – and the plantation sector, the later being essentially Samoa Trusts Estates Corporation (WSTEC).

2.03 The livestock sub-sector is mainly village based and is composed of pigs and poultry. Fishing is an important occupation in the village economy and provides a major source of protein in the diet and an important source of cash income. Forestry has become an important export industry and also provides building material and firewood for domestic use. In the sequence of land development and use in villages, forest lands are first cleared and then followed by food crops for about two or three seasons before perennial crops are planted. An overview of the crop sector is briefly given below which provides a background to appreciate the census results.

Tree Crops Sub-Sector

2.04 The main tree crops grown in Samoa are coconut and cocoa with a small area of coffee grown by WSTEC. There are no other tree crops of commercial importance.

2.05 According to Census of Agriculture 1989 96% of the holdings were growing coconut and the total area under coconut was 68400 acres, of which 57600 acres was in the house hold sector and 10800 acres in the non-household sector. In terms of area under coconut grown as a mixed crop coconut and cocoa was the most important crop mixture.

However other crops like banana, taro and taamu were commonly grown with coconut as mixed crop.

2.06 The total area under cocoa as per 1989 Census of Agriculture was 20,800 acres out which 4600 acres was in the non-household sector.

Food Crops Sub-Sector

2.07 Taro is the most commonly grown root crop and the preferred starchy staple. The corns, in addition to providing a highly digestible carbohydrate, have a high mineral content and are a good source of calcium. Under favorable conditions of well distributed rainfall, this crop is known to ensure a continuous supply of food through the simple expedient of planting in direct proportion to requirement. The crop matures in seven to nine months and frequently ratooned with the second ratoon being harvested after about four months. In areas with less rainfall, planting may be restricted to the rainy months. Leading to a short break in supply. Taro is particularly well adapted to the high rainfall conditions of Samoa and in the wetter parts of the country it is planted throughout the year.

2.08 The area under Taro as per 1989 Census of Agriculture was 36,500 acres. The area under this crop is entirely under the household sector. Nearly four fifths of the area under Taro is planted as a single crop (pure). It is also grown in mixture with other crops. The most popular mix is taro-taamu.

2.09 The two Cyclones in January 1990 (OFA) and December 1991 (VAL) caused extensive damage to all crop types but most especially to tree crops including coconuts, cocoa and banana plantations. As the

situation was improving after the cyclones, agriculture sector was severely affected by the Taro Leaf Blight in 1993. This led to the complete destruction of the country's major export and domestic crop taro.

Banana

2.10 The banana industry of Samoa is predominantly a small farmer industry. It is a major item of food both in the villages where it is grown and in the urban markets (mainly Apia). In the past, large quantities were exported. Disease and nematode build up have been largely responsible for the decline of a once lucrative export business in bananas. The situation was made worse by the two cyclones in 1990 (OFA) and 1991(VAL), which caused extensive damage to Banana plantations. The total area under Banana was 5,600 acres in 1989 Census of Agriculture.

Passion Fruit

2.11 Passion fruit (passiflora edulis var Flavicarpa) grows well up to about 600m under the prevailing conditions of soil and climate in Samoa. A well distributed rainfall of around 400 mm favors the crop. Local passion fruit production is a good example of successful commercial development. The industry started in 1975, some 10 years after the original introduction. Since then it has shown steady growth. A large measure of this success lies in the evolution of integrated production, processing and marketing, backed up by coordinated activities between the Development Bank of Samoa, the Food Processing Laboratory and supplies of production inputs.

Breadfruit

2.12 Breadfruit (artocarpus altilis) is an important carbohydrate staple in Samoa. It is already well established as a small holder crop with good distribution throughout the country. Although there are a variety of known preservation practices based on fermentation and drying, they are little used. Breadfruit is indigenous to Polynesia and most of the known cultivators may be found in Samoa. In addition to the indigenous types, introductions of the South Pacific Commission (SPC) collection are planted at Vailima. Breadfruit is grown primarily as scattered crop. In terms of number it is the most important tree crop.

Other Root Crops

2.13 Taamu (Alocasia macrorhiza), also known as the giant taro, is used mainly as a food reserve. It provides security of food supply to the rather fragile food system based on continuous supply and the absence of storage. The crop has received little scientific attention but is claimed to be disease-free. Tania (Xanthosoma sagithifolium) is an edible root from the Caribbean and is not as favored as the indigenous species. It grows well locally and provides an acceptable taro substitute particularly after the devastation caused by Taro Leaf Blight in 1993. Winged yam (Dioscorea alta) appears to be less important than in former times. An important constraint to yam production is the high labor cost per unit of tuber yield. Although capital intensive production technologies have been developed for this crop, these have not been adopted in Samoa, and it is likely that this crop will continue to decline. The Pacific yam (Dioscorea numularia) is a white fleshed tuber with an attractive taste and texture. This crop is perennial and provides a useful food reserve. Its tolerance of shade gives it potential for interplanting in fuelwood plantations. Its use is

advocated in simulated bush fallow systems with a climax vegetation of fuelwood plantations. The sweet potatoes (Ipomea batatas) are a high yelding root crop with a comparatively short growing season. It is not indigenous to the Pacific but has become important in Papua New Guinea. Should the higher areas of Samoa become settled, sweet potato could become a useful carbohydrate crop.

Vegetables

2.14 Only plants traditionally used as vegetable foods are discussed here. Taro is a source of leaf material, the most frequent use being as palusami. Another Polynesian use worth noting is taro boiled with coconut cream, as in the Fijian rou rou. The leaf petioles – blanched, peeled and served with lemon fruit – also make an attractive dish. The pumpkin (Curcurbut pepo) is well adapted to condition in Samoa and grows well on the detritus remaining after land clearing. There is little systematic production, but small quantities are sold in market to add variety to the diet. Successful small-scale market gardens have sprung up close to Apia with private sector initiative. Except for a first consignment of green capsicum and eggplant in the 1970s, no significant exports of vegetables have taken place.

Fruits

2.15 Oranges and mandarins are grown in the villages, with the main concentration being in the drier western areas of the two main islands. These are widely used as snack foods, providing a useful source of vitamins and competing advantageously with franchised soft drinks. Limes, in contrast, are more widely distributed and may be grown in wetter areas. Citrus fruits are plagued with serious pests and diseases that are important constraints to production with smaller stands of trees in the villages the losses due to these sources are more easily absorbed. Small quantities of citrus have been exported.

Other Crops

2.16 Pandanus provides the main raw material for village handicrafts, the manufacture of which absorbs a high proprotion of women's time. This material is reportedly in short supply, and some attention to the multiplication of pannanus and its availability at the village level is required. The felted barked from paper mulberry (Broussonetia papyrifera) is used to make siapo, which, together with mats made from pandanus, forms part of the currency in the subsistence sector. These materials are also in short supply.

CUSTOMARY LAND TENURE AND AGRICULTURE DEVELOPMENT

2.17 The basis of the 'f'aa-Samoa', the Samoan way of life, is clearly the matai system of chiefly titles, where extended (or multiple) families reside under the leadership of one of their members whom they select to hold the family's specific chiefly title or matai title. The matai systems in turn depend upon the matai's authority or pule over the members of his extended family and his pule over family lands.

2.18 In the traditional fa'a-Samoa, the lands are owned by the extended family or aiga, just as they own the chiefly matai title to which they elect one of their members. Once elected to the family title, the matai has pule, authority, over the members of the aiga and the lands of the aiga. It is this 'commercial' nature of the traditional Samoan family labour and land ownership, which has been the subject of much debate and discussion. Turner wrote in 1884 that the Samoan 'Communistic System is a sad hindrance to the industrious and eats like canker worm at the roots of individual and national progress.' Many other researchers view the Samoan land tenure system as an impediment to agricultural development. However Tim O'Meara, another researcher

says ‘like other aspects of Samoan Culture, the apparent conservatism of the land tenure system is more superficial than fundamental’. In fact, a dramatic change toward individual land tenure has been occurring in Samoa villages since well before World War II. This change is rarely recognized outside of the rural villages, and has been reported by previous searchers. The Land and Tittles Court do not accept the modification of customary tenure as legitimate, and thus it has no legal sanction. But, the change in tenure systems has proceeded to the point where the majority of village lands is now held by individuals rather than extended families, and is inherited directly by those individuals’ children, rather than indirectly through the acquisition of matai titles as in the traditional system.

2.19 This dramatic change in customary land tenure is significant for two reasons. First, it shows that Samoans are not rigid or bound by tradition. They can and do adapt to changing economic circumstance. Second, the security of land rights is increased under the modified system because it assigns tenure to the individuals who clear the land, and inheritance rights are assigned exclusively to their children. Thus, except where the modified system may come in conflict with the Land and Titles Court. Security of tenure is much greater under the modified system than it was under the traditional system. Because of this, security of tenure is not presently a significant cause of low productivity in village agriculture, as it may have been under the traditional tenure system. Instead, it is the low economic return to agriculture as compared to other sources of income which is the significant cause of the stagnation of village agriculture.’