ABSTRACT

A COMPARATIVE ANALYSIS OF CHANGE IN THE ADOPTION OF AGRICULTURE, PUBLIC HEALTH AND MEDICAL CARE PRACTICES FROM 1955 TO 1965 IN SIX SELECTED VILLAGES OF CEYLON

By

Le Thi Xuan

PURPOSE OF THE STUDY

The purpose of this study was to investigate the changes in four Sinhalese villages--Illukwewa, Higoda, Ellagala and Hinguraka--and two Tamil villages--Idaikurichy and Varany North--from 1955 to 1965.

These changes were also used to compare the two types of ethnic villages, Sinhalese and Tamil, to see whether their differences in history, geography, tradition, culture and socio-economics had any influence on the recommended adoptions of agriculture, public health and medical care practices.

PROCEDURE

Sources of Data

This present research was based on the data collected by Sower and Welikala in their studies of Ceylon in 1955 and 1965 in which the samples were six selected villages

of Ceylon. Four of them were Sinhalese speaking villages including Hinguraka, Higoda, Ellagala and Illukwewa. The other two were the Tamil speaking villages of Idaikurichy and Varany North. They were purposely chosen to represent the typical characteristics of each region.

The family units of each village were investigated. These units were randomly selected from each village. There were also cases where all the village units were selected for investigation.

Interviews were used to collect the information. There was a total of 479 and 377 interview schedules available from the study of 1955 and 1965 respectively.

Statistical Test

Based upon the availability of identical data from both studies--Ceylon in 1955 and 1965--the author used the Chi-square statistic to test the null hypotheses of no differences between the two types of ethnic villages and no differences between the two time periods in relation to the recommended adoptions of agriculture, public health and medical care procedures.

Contingency tables were set up by calculating the number of villagers falling in each category. The total number of four Sinhalese villagers who belonged to the

same category were grouped together. The same thing was done with the two Tamil villages. As a result, six selected villages were compared not as six separate villages but as two types of ethnic villages--one Sinhalese and one Tamil.

The calculated χ^2 was computed and if it was bigger than the critical value of the χ^2 at the .01 level, the null hypotheses were rejected.

CONCLUSIONS

The findings of this study show a significant difference between the two types of ethnic villages in terms of recommended adoptions of agriculture, public health and medical care practices.

The findings also show a significant change from 1955 to 1965 in the Tamil villages; however, this change demonstrated a decrease in the adoption of such recommended practices while not much statistically significant change was observed in the Sinhalese villages after a period of 10 years.

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INTRODUCTION

The problems faced by the underdeveloped countries after the independence days or after World War II were how to improve their countries and how to make them appropriate for the new situation; that is, to be free, democratic and self-governed instead of being ruled and dependent on colonialism.

The governments of those countries were trying to make their nations strong, self-defensed and self-supporting by raising the standard of living, improving education, the economy, agriculture, industry and developing social welfare and public health. These are popularly regarded as community development aiming at alleviating poverty and illness.

A study evaluating the change and progress made by these countries in the area of community development in villages or rural areas (because most of these countries are agricultural ones) is very beneficial and one which will help the governments to look at their achievements as well as their failures in order to improve their programs.

Moreover, knowledge on how and why change was not achieved and how change can be more effectively investigated and the prediction of such change and the measurement of their results are some of the fields in which meaningful research can be conducted.

In this connection, as a citizen who really cares about the destination of her country--Vietnam--the author had the intention to do a study on the social and economic development of Vietnamese villages but unfortunately, due to the lack of data and documents she had to give up that idea and turned it into evaluating the results of the rural development program of Ceylon, an Asian country which has somewhat similar situations and characteristics to Vietnam and which has an extensive development program after the first two decades of her independence from British colonialism (1948) just like Vietnam after her independence from the French influence (1945).

As a result, this study was made with the purpose that it will help the readers to have an insight into the problems of change and the difficulties in promoting change in Ceylon in particular and in the Southeast Asian countries in general.

Chapter 1

A BRIEF NOTE ON CEYLON AND HER CITIZENS

Ceylon is an island south of India lying between six and ten degrees North Latitude. It is pear-shaped, narrowing toward the North. In size, Ceylon is about as large as Ireland--272 miles long and 140 miles wide at the broadest point and has an area of 25,332 square miles.

The population of the country at the census of 1953 was 8,098,637.[1] Almost 70 percent of the population are Sinhalese and are largely Buddhist in religion. They immigrated from the borders of Bengal around the fifth century B.C. The Sinhalese are divided into two sub-groups: the low-country Sinhalese (approximately 62 percent) who live in the Western, Southern and North-western Provinces and the Kandyan Sinhalese or up-country Sinhalese (approximately 38 percent) who live in the central provinces. There are no racial differences between the two but the low-country Sinhalese have had an

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[1] I. D. S. and M. I. Veerawardana, Ceylon and her citizens, Oxford University Press, 1956, p. 1.

economic and professional advantage over the up-country Sinhalese due to the Western influence since the 16th century on the low-country provinces.[2]

Ceylon Tamils represent 11 percent of the total population. They formed the largest minority group concentrating in the Northern and Eastern areas of the island. As the descendants of South Indian Tamil invaders, who came between the eighth and twelfth centuries, they speak Tamil language and are Hindu in religion. The conflict of religion and language between these two ethnic groups has caused a lot of troubles in Ceylon's political history.

The rest of the population (6 percent) are the Moors, Malays and Burghers. The Moors are of Arab descent and the Malays are descendants of mercenary soldiers brought into the island by the Dutch in the seventeenth century. They are both Muslim in religion and speak the Tamil language. The Burghers are descendants of marriages between Dutch, Portuguese and Ceylonese. They are Christian and English speaking.

Ceylon also has a group of foreigners such as Indian Tamil, Pakistans, and Europeans who keep their nationality but control much of Ceylon's commerce. The

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[1] Ibid., p. 6.

whole importing of food and textiles has always been in the hand of the Indians and the exporting trade in those of the Europeans.

Of the population as a whole, half are engaged in agriculture and only one-tenth in industry. Ninety percent of the population are country dwellers.[1] The rest live in the cities, towns and estates on plantations.

Ceylon lives by its export of agricultural products, such as tea, rubber and coconut.

From the historical point of view, Ceylon was dominated for almost four hundred and fifty years by the Portuguese, Dutch and then the British. She received her independence from the British through peaceful negotiations in 1948. A self-government has operated since then; however, its political administration is somewhat similar to that of the British and those in the Commonwealth nations in general.[2]

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[1]Sir Charles Jeffries, Ceylon, the Path to Independence, Frederick A. Praeger, Publisher, New York, 1963, p. 4.

[2]S. Arasaratnam, Ceylon, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1964, p. 2.

Chapter 2

BACKGROUND OF THE STUDY

The original research studies of 1955 and 1965 which this present study begins with were evaluations of the Rural Development program and its effects on the Ceylon villages.

THE RURAL DEVELOPMENT PROGRAM

The year 1948 was the turning point in Ceylon's history not only from the political point of view but also in economic and social aspects as well.

Theoretically since 1931, Ceylon has had adult universal suffrage under the Donoughmore Constitution, which gave Ceylon her own Parliament and let the Ceylon government for the first time be responsible for her own internal affairs. However, in practice most of the programs of economic and social development in the country were not started until after 1948. Since then all efforts were accelerated in order to expand all development activities.

In this connection, the Department of Rural Development was inaugurated in 1948 to carry out the

development program. It aimed at bringing out coordination between different departments of government; establishing a good relationship and understanding between the people and governmental administrators; and creating in the people a desire to help themselves.

This department was operated under the Ministry of Home Affairs. This program was structured within each District and Division. At the District level there is a Rural Development supervisor. At the Division level the program is directed by the RD officers who cooperate with the Division Revenue officers and other Divisional government programs.

The Rural Development officers in turn work with the Rural Development Societies of all the villages in the Division. The government assisted these societies in their projects of construction by providing funds. The villagers also contributed either with their voluntary labor or financial aid to achieve the success of the projects.

THE RURAL DEVELOPMENT EVALUATIVE MISSION IN 1955

In 1955 a mission comprised of a sociologist and an economist from the United States were sent to Ceylon at the request of the RD department in order to make an evaluation of this program.

The team comprising Christopher Sower, a sociologist from Michigan State University, and Elmer Bratt, an economist from Lehigh University, went to Ceylon in 1955 for a period of ten months under a Fulbright Research grant to work with the Ceylonese government for that purpose.

Bratt conducted an overall report on the economic viewpoint of the RD program[1] while Sower conducted a sociological study on selected types of change and adoptions in eleven of the villages which were representative of ethnic, ecological and historical differences in the country.[2] There were six Sinhalese villages (Mahawaskaduwa, Wellaboda, Higoda, Ellagala, Hinguraka, and Illukwewa) and five Tamil villages (Idaikurichy, Varany North, Sillaly, Navaly, and Chavakkaddu).

Sower conducted interviews with the villagers in the selected villages mentioned above to collect data which showed the extent the Ceylon villagers adopted the practices of public health, medicine, agriculture

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[1]"An overview of the Rural Development Program in Ceylon," Elmer C. Bratt, Lehigh University, 1956.

[2]"The Ceylon Village Development Program, A Sociological Analysis," Christopher Sower, 1955.

and cooperation (the method of this original research will be discussed later and its data will be analyzed in the present research).

At the same time, George Welikala, District officer in the RD department, was appointed by Ceylon's government to work as a liaison person between the research team and the Director of Rural Development. He assisted the team in their work and communication with the department.

Later on he went to the United States and wrote a thesis for his Masters degree in the Sociology and Anthropology Department, Michigan State University in 1959.[1] Based on a portion of the data in the evaluative study of Sower in 1955, this thesis was an attempt to analyze the relationship of the social characteristics--such as income, education, age--and attitudinal characteristics of the villagers--either satisfaction or unsatisfaction with their lots--and the adoptions of some agricultural, medical, public health and cooperative practices in six selected villages: Higoda, Ellagala, Illukwewa, Hinguraka, Idaikurichy and Varany North.

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[1] "An Analysis of the Adoption of Some Agricultural, Medical, Public Health and Cooperative Practices in Six Selected Villages of Ceylon," George Welikala, 1959.

THE RURAL DEVELOPMENT EVALUATION MISSION OF CEYLON IN 1962

In 1962, Sower again came to Ceylon together with two other Americans, Ware and Ghosh, to form another evaluation mission of the rural development program and its results on Ceylon's villages.

This time Sower focused on two problems, the design of an effective district development organization and means to achieve development goals while Ghosh and Ware examined the program as a whole. They all came up to the same evaluation and recommendations summed up in the "Report of a Rural Development Evaluation Mission in Ceylon, 1962."

THE ORIGINAL STUDY OF 1965

The study of 1965 was conducted by Welikala, Ceylonese cooperator of Sower in his study of 1955. The same problem of the study of 1955 was investigated again with six selected villages, namely Higoda, Illukwewa, Ellagala, Hinguraka and two Tamil villages: Idaikurichy and Varany North. The same method of investigation was also conducted with some variations in the interview questions. However, there are 11 tables available in both studies 1955 and 1965 which are identical. These tables deal with the extent to which

each village adopted public health, medicine, and agriculture practices.

The data of both studies are available in percentage form and are stored on IBM cards at Michigan State University.

THE RESEARCH METHOD

SAMPLE AND UNIT OF INVESTIGATION

As mentioned in the original studies of Sower and Welikala, it was impossible for them to take a random selection of the villages which could be representative of all the villages of the whole country.

Therefore at the first step they zoned the island into six major regions according to ethnic, social, cultural and economic characteristics.

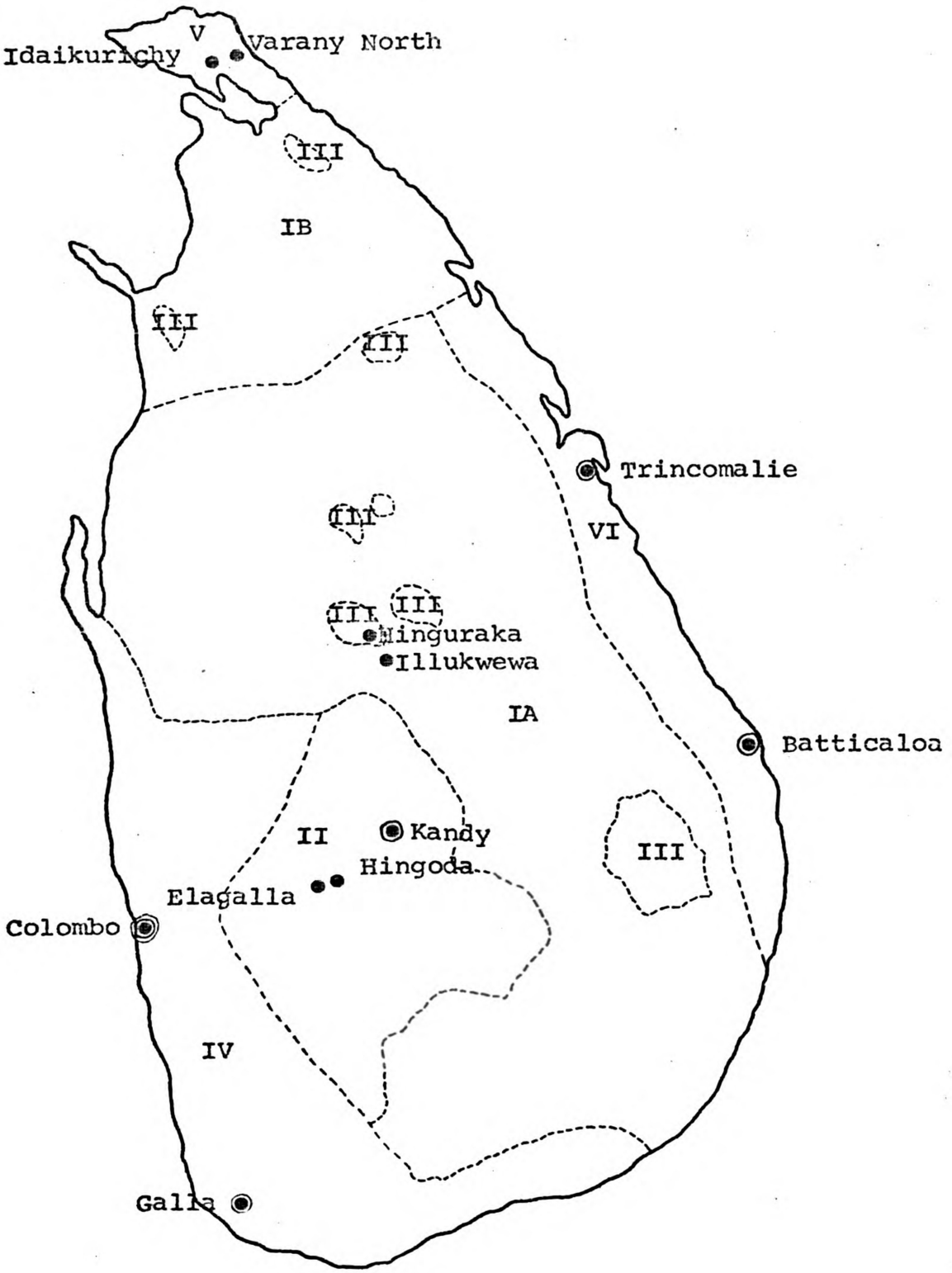
As shown in Figure 1, the island was divided into:

1. Zone I is a dry jungle region, sparsely populated. It is also divided into two sub-regions: IA is occupied by the Sinhalese and IB is occupied by the Tamils.

2. Zone II is the hilly region which grows tea and rubber in the central area of the island.

3. Zone III is also jungle area but cleared and turned into irrigation colonies. Immigrants from other densely populated areas came and settled there.

Figure 1
Major Socio-Cultural Regions of Ceylon.



Reproduced from Rural Sociology, Vol 15, p6.
Colonization Schemes (Region III), and the six villages in which the present research was conducted have been added.

4. Zone IV is the Southwest coastal belt, the most thickly populated and very open to foreign influence.

5. Zone V is the peninsula north of the island, occupied by the Tamils, which is densely populated.

6. Zone VI lies on the east coast, occupied by the Moors and Tamils, densely populated and some of the biggest villages are located in this area.

Having zoned the country, the next step was to choose typical villages which represent the region's characteristics and the different degrees of success of the rural development society in each village (whether it is fairly successful, average or below average.[1] This judgement was made by the Division Revenue officer of each region.)

Finally, a list of 11 villages was selected for the intensive study of 1955. But in the study of 1965 only six out of those 11 villages were investigated again which limits the present research. They are: the jungle village of Illukwewa of region IA, the hill villages of Ellagala and Higoda in region 2, the irrigation colony of Hinguraka, the Tamil villages of Idaikurichy and Varany North.[2]

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[1]Christopher Sower study of 1955, p. 47.

[2]For more details of these six selected villages, see their descriptions on page 18 of this chapter.

The selection of those villages was not random; however, generalization can be made to other villages which have the same characteristics.

The next stage was to investigate families in each village. The unit of the study therefore was the nuclear family. It is necessary to notice at this point that there may be two or three nuclear families living in the same house (for example, married brothers and their families). In this case, "if a single pot of rice was boiled for each nuclear family then they were considered as separate families and consequently separate units. If a single pot of rice was boiled for all families in the same house it was considered as one unit."[1] Therefore the unit was described by the food preparation. These units were randomly selected from each village. There were also cases where all the village units were selected for interviews (such as in Higoda and Illukwewa).

PROCEDURE: INTERVIEW

Selection and Training of Interviewers

The procedure used in the original studies was the interview. This procedure is good as far as the interviewers are trained adequately.

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[1]George Welikala, op. cit., 1959, M.S.U., p. 12.

Therefore the problem in the original study (1955) was to find interviewers who had fairly intimate knowledge of the villages selected for the study and who were known by the village residents. After the searching, the interviewers were selected from six villages. Of these 11 were school teachers, two were secretaries of local Rural Development Societies and one was an English non-resident of the village.

The English-speaking interviewers were trained by Sower, the Sinhalese interviewers by Welikala and the Tamils by Thambiah and Visvanathan, the Tamil Divisional Revenue and RD officers.

The technique of interviewing was taught to them; the interview schedule was discussed and explained clearly to them before the interviewing and interview pretests were conducted to make sure that they would collect objective and exact data later on.[1]

As mentioned in the original study of 1955, those interviewers did do a good job and achieved maximum objectivity.

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[1]For more detail of this selection and training of interviewers, see Welikala's thesis, M.S.U., 1959, p. 14.

The Interview Schedule

The schedule was prepared in English by the researchers with the help of Ceylonese Divisional Revenue officers in districts selected for research.

After a careful pretesting the schedule was translated into Sinhalese and Tamil for the research. Finally the interviews were conducted with the male head of each household.

For the six villages, a total of 478 schedules were available from the 1955 study. Then they were translated into English for analysis. The breakdown by villages is as follows:

Sinhalese villages:

- Illukwewa: 27--constitutes all families in the village.
- Higoda: 63--constitutes all families in the village.
- Ellagala: 50--constitutes a 50 percent random sample of all families in the village.
- Hinguraka: 92--constitutes a 50 percent random sample of the families in the village.

Tamil villages:

- Idaikurichy: 196--constitutes all the families.
- Varany North: 50--constitutes a 25 percent random sample of all the families.

From the study of 1965 there were a total of 377 schedules. The breakdown by villages is as follows:

Sinhalese villages:

Illukwewa: 35 families

Higoda: 74 families

Ellagala: 59 families

Hinguraka: 110 families

Tamil villages:

Idaikurichy: 47 families

Varany North: 52 families

The Interview Questions

The type of questions used in the original studies of Ceylon in 1955 and 1965 were multiple-choice. The respondents answered by choosing one among 2, 3 or 4 alternatives which were the most appropriate to them.

For example:

a. What is your source of drinking water?

1. from fully protected well ___

2. from partially protected well ___

3. from unprotected well ___

b. What type of material is used in your house construction?

1. mud-thatched ___

2. masonry-tiled ___

3. ola-thatched ___

The interview questions in general dealt with the adoption of recommended practices in public health, medicine, agriculture and cooperation in six selected villages.

The data of the two original studies were in the form of percentage (as shown in the figures in the Appendix).

DESCRIPTION OF SIX SELECTED VILLAGES AND THEIR REGIONS

As mentioned in the original studies of Sower and Welikala, the six selected villages were felt to be the most typical ones and representative of most of the villages in the same region.

SINHALESE VILLAGES

Illukwewa

This village is located in the jungle region I. This region covers almost three-fourths of the country (see Figure 1). The north part of this area IB is occupied by the Tamils (about one-fifth of the region), the rest IA by the Sinhalese.

Illukwewa is in the center of this region, about 180 miles from Colombo. The annual rainfall in this village is from 50 to 75 inches, most of this rain falling during the Northeast monsoon from October to

January. Thus for over six months of the year this village as well as others in this region, has weather which is hot and dry. During this time the villagers use water stored in their reservoir tanks[1] during the rainy season for domestic and agricultural use.

Consequently there are two cultivation seasons, one with the water rain and one with tank water. All the villagers practice two types of agriculture: paddy cultivation and shifting (chena) cultivation.

For the shifting cultivation, they clear a small patch of virgin land and burn it in the dry season. Then when the first rain comes they cultivate chilie (pepper), maize, vegetables and millets. They cultivate this land for two or three times until it becomes less productive and then they abandon it and select another patch of jungle and start again.

The inhabitants in this village live by trading their agricultural products. This is the poorest and the most traditional village among the four Sinhalese villages. As shown in Figure 2 below,[2] Illukwewa was placed at the highest point on the traditional-transitional

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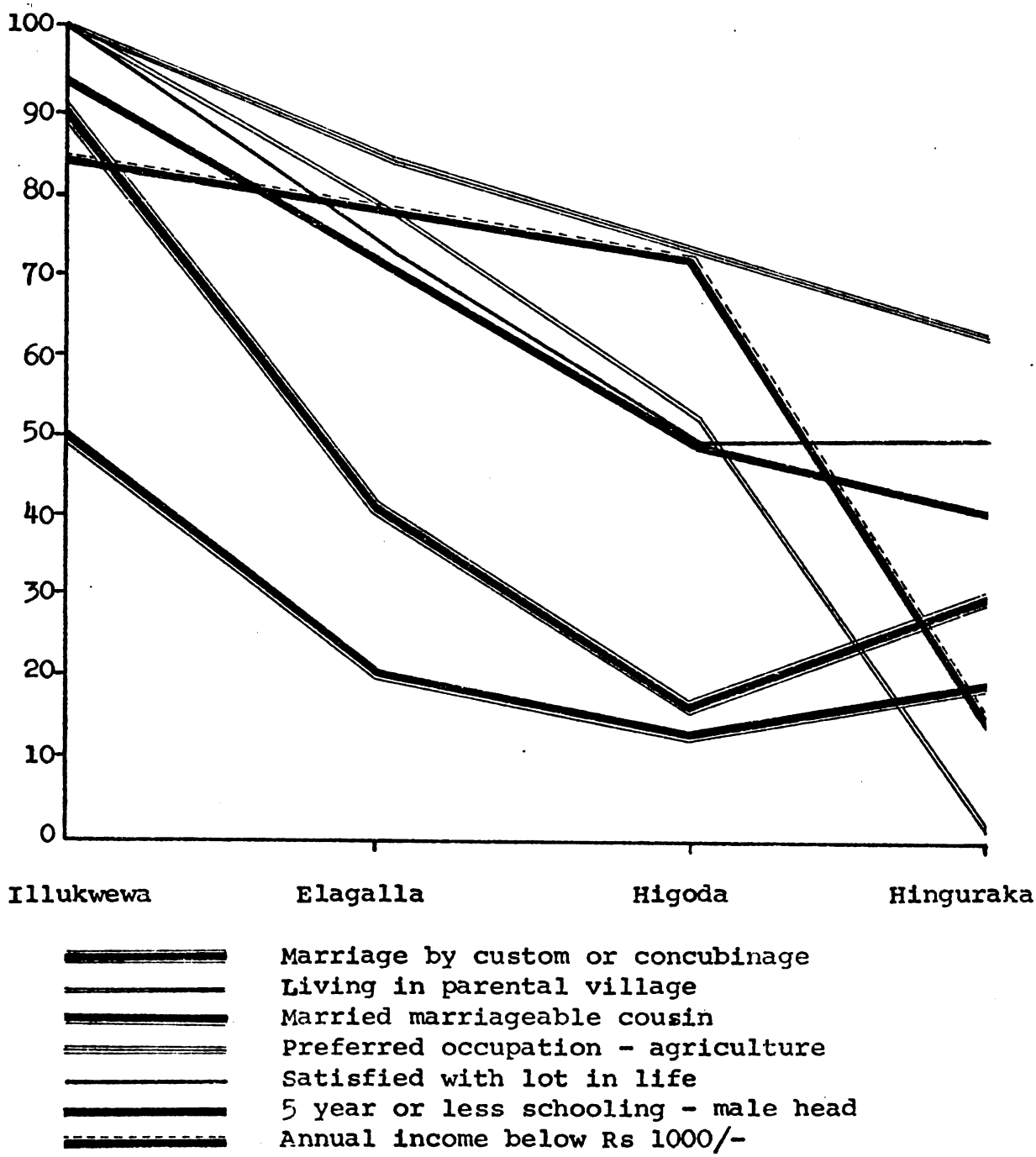
[1]Tanks are artificial lakes created by earthen dams. A tank is usually from 15 to 40 feet deep. It can cover a water surface area of 10 to 15 square miles. These tanks were built a long, long time ago and now they are repaired and still in use.

[2]See Welikala study, 1959, pp. 38 and 39.

Figure 2

The Percentage of Respondents Showing Traditional Characteristics in each Sinhalese Village - Modified from Welikala (1959), p.39, fig.3.



continuum which was determined by the percentage of the traditional characteristics such as living in parental home, satisfied with lot in life, prefer agriculture occupation, five years or less schooling, marriage by custom or concubinage, annual income below 1000 RS/, etc.

The population in this jungle region is sparse. It varies from 16 to 73 persons per square mile.[1]

In Illukwewa, the extended family forms a strong social unit. The caste system is very strict here. It is a single caste village. Therefore inter-marriage with partners from other villages is limited to five miles away through the jungle only.

Modern civilization only came to this village since 1948. Schools were built and roads for transportation were constructed by the state since then. The Rural Development Society cooperated with the work of the state and the local peasants to undertake the construction.[2] They demonstrated and instructed the villagers on a new method of agriculture and helped them to settle land disputes among the residents. Means of communication such as daily newspaper, radios, magazines were also popularized since then.

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[1]Ranasinghe, A. C., Census of Ceylon, 1946, Vol. I, Part I, Colombo: Ceylon Government Press, 1950, p. 66.

[2]For more details of RD Societies' job, see Sower, op. cit., in which he listed what RD had done.

These activities were spread all over the country but this jungle village which was isolated for many centuries and was therefore the most traditional village among the six selected ones, has experienced a surprising change since then.

Ellagala and Higoda

These two villages are located close together in the Kandyan hill area (region 2) of the island. They are located on the hillsides (2,000 feet elevation)[1] and surrounded by tea and rubber estates.

Ellagala is about 60 miles from Colombo and Higoda is a mile from Ellagala. They have the same characteristics, but differ in the ranking of success in the Rural Development society. Ellagala's RD society was rated by the District Revenue Division as more successful than that of Higoda;[2] and according to Welikala, Ellagala was more traditional than Higoda. As shown in Figure 2, Ellagala was placed at the second highest and Higoda third on the traditional-transitional continuum among four Sinhalese villages.

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[1]Christopher Sower, op. cit., p. 56.

[2]Ibid., p. 47.

The annual rainfall is about 200 inches; so usually there is ample water. The population density is about 650 per square mile.[1] These villages are more densely populated than in Illukwewa.

These villages were inaccessible until 1815 when the British domination came to the island. The jungles were then cleared for tea and rubber plantations. However, their residents refused to work as employees on the plantation. Thus, the Indian labor was imported from South India to work there. Due to the increase in migration of the Europeans and the Indians for the plantations and industries and due to the rising level of unemployment for the Sinhalese,[2] a policy was made by the Ceylon government to control the Indian immigration to the plantations of this region.

The local residents of Higoda and Ellagala since then have begun to work for wages on the plantations and still cultivate their paddy land at the same time. These cultivators therefore went out of their villages to work outside for money. They traveled on foot daily from the village to work and return home in the evening.

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[1] Ibid., p. 56.

[2] Before 1857 the population density was 47 people per square mile; in comparison with 1946, the population was 650 per square mile. See Ranasinghe, A. C., Census of Ceylon 1946, Vol. I, Part I, Colombo: Ceylon Government Press, 1950.

In this sense, the hilly peasants showed signs of changing from their traditional reliance on agriculture as a way of life into a new pattern of money earning by salary.

Unlike the jungle village of Illukwewa, these villages do not have very rigid caste systems. One, two or more castes can live in the same village.[1]

Hinguraka

This is one of the newest irrigation colony villages built in the mid 1930's under a government policy which provided for the jungle to be cleared for cultivation, houses to be built for the landless peasants and those from large families in thickly populated areas. They were given five acres of irrigable paddy land and three acres of high land where their houses were built. In 1957 this plan was modified to include only three acres of paddy land and from one and a half to two acres of highland because a family couldn't take care of five acres of paddy land without hired labor.[2]

Irrigation systems were constructed for domestic and cultivative use. Roads, houses, recreation areas,

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[1] Welikala, op. cit., p. 28.

[2] Ibid., p. 29.

school, hospitals, etc. were built for public use. Around 150 families were settled together in a settlement unit bordered by the irrigation channel.[1] Residents in this colony village therefore did not belong to the same caste. Here several casts lived next to each other. They have been brought over into a new social, cultural and physical environment which was entirely different from their own. They benefitted from more convenient and more modern facilities supplied by the government than the other five villages. As shown in Figure 2 (page 20), Hinguraka was placed at the wealthiest and the least traditional among the four Sinhalese villages.

Thanks to the privileges alloted to this irrigation colony, its residents enjoyed a better life than the others. The irrigation scheme made their cultivation less dependent on the weather.

TAMIL VILLAGES

Idaikurichy and Varany North

Being located in the same region--the peninsula north of the island--these two Tamil villages bear the

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[1]De Silva, Gal Oya Development Board, Annual Report, 1956-57, The Times of Ceylon, Colombo.

same characteristics but are different in the degree of success of the Rural Development Society. Idaikurichy was rated as fairly successful while the other village was below average[1] (rated by Revenue Divisional officer).

The annual rainfall in this region is as low as in Illukwewa of region I. The residents in these two villages experienced hot and dry weather all year round, except for only 100 days of rain.[2]

As the Illukwewa villagers settled around their village tanks, the residents of Idaikurichy and Varany North settled themselves around their village wells. Due to the fact that there are no rivers and no tanks in the peninsula, water for domestic use and for cultivation come from those constructed wells.

The population density in these villages is 331 persons per square mile. Several castes may live in the neighborhood; however, caste inter-marriage is more rigid in these Tamil villages than in the other Sinhalese villages.[3]

The soil is not fertile in this region; however, agriculture is the main occupation. The farmers grow

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[1]Christopher Sower, op. cit., p. 67.

[2]Ibid., p. 205.

[3]George Welikala, op. cit., p. 33.

paddy, chilie, bananas, mangoes, yams and tobacco. Crop rotation is a common feature of their cultivation practices.

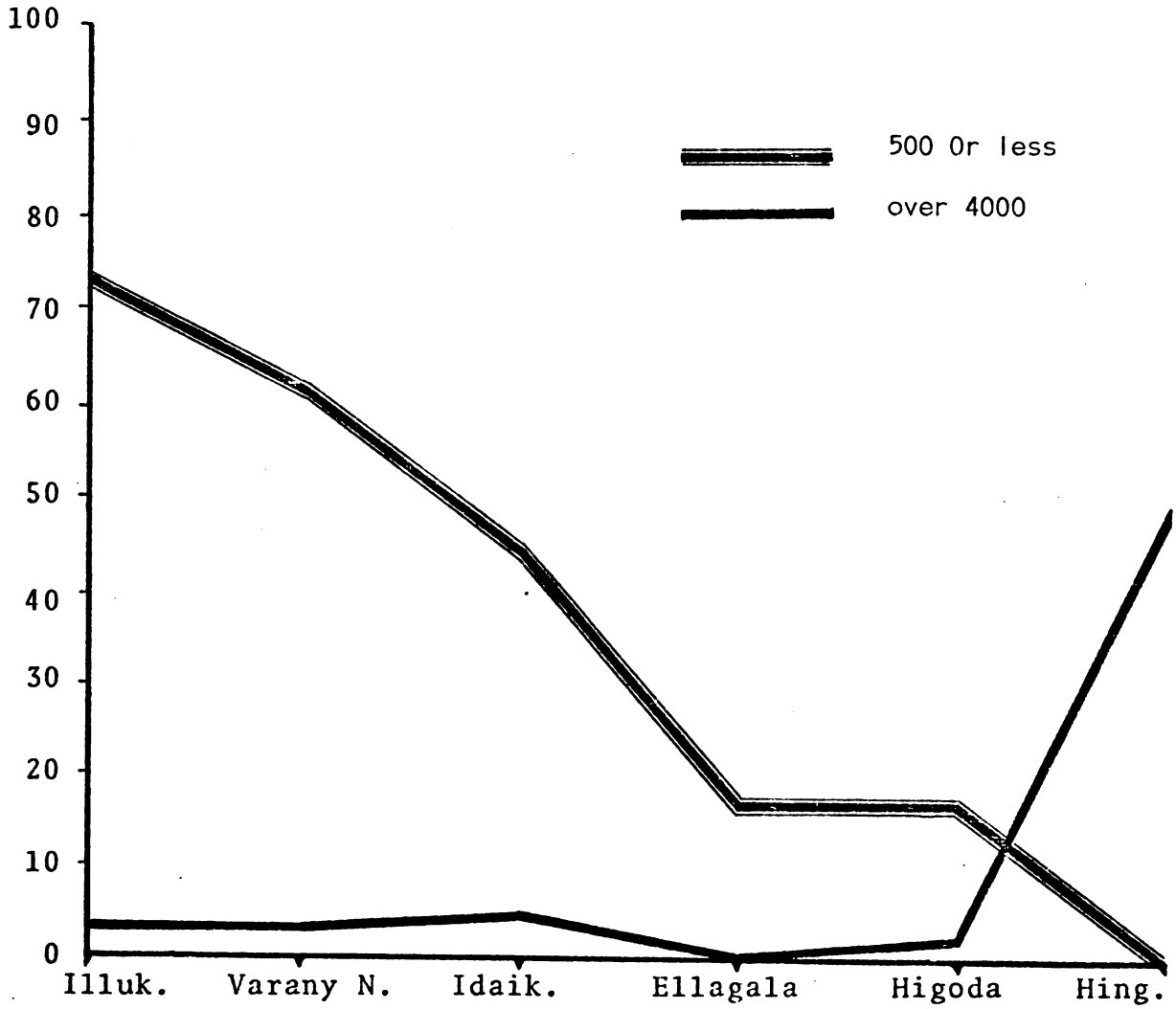
The palmyrah palms which grow abundantly in these villages are of great use. They supply food, drink and especially shelter. (Most of the shelters were made of ola-thatch material which comes from the palmyrah palms.)

The soil here is also suitable for the growing of coconut trees which often yield more than the palms; but because it is easier and it takes less time to grow palm than the other, their villagers prefer to grow palms more than coconut trees. This fact together with the unfertile soil makes their yield less than it should be. The following figure will give the readers an idea of the percentage of respondents showing income/RS of each village in 1955.

As shown in Figure 3, Illukwewa was placed at the lowest income level, then Varany North, Idaikurichy, Ellagala, Higoda and the highest one was Hinguraka.

Figure 3
Percentage of Respondents Showing Income in Each Village in 1955.

Income/Rs	Illukwe.	Varany N.	Idaiku.	Ellagala	Higoda	Hinguraka
500 or less	73	62	44	17	17	0
101 - 1000	12	24	32	60	57	09
1001-2000	12	11	16	21	15	21
2001-4000	0	0	04	02	09	20
over 4000	03	03	04	0	02	49



Chapter 3

THE PRESENT RESEARCH

STATEMENT OF THE PROBLEM

Based upon the data of the original studies of Ceylon by Sower and Welikala in 1955 and 1965 this present research goes one step further in analyzing the data.

The purpose of this study is to investigate the changes in six selected villages of Ceylon from 1955 to 1965--four Sinhalese villages comprising Illukwewa, Higoda, Ellagala and Hinguraka and two other Tamil villages (Idaikurichy and Varany North)--they are investigated not as six individual villages but as two ethnic villages, one Sinhalese and one Tamil.[1]

Then these changes were used to compare the differences between the Tamil and Sinhalese villages in the adoption of recommended practices of agriculture, public health and medical care.

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[1]Hereto the words "Sinhalese and Tamil villages" will stand for four Sinhalese and two Tamil villages.

LIMITATION OF THE PROBLEM

The problem of change is too large to be dealt with effectively; and so the scope of the problem was limited to looking at changes in the area of medical care, public health and agricultural methods and production.

These areas of adoption were already investigated in both studies of 1955 and 1965. However, only 11 variables were exactly identical in both studies. Because of this limitation of identical data, this research was restricted in comparing those available variables.

Moreover, due to the lack of raw data it is impossible for the author to correlate the cross tabulations which would have provided for interesting results.

STATEMENT OF THE HYPOTHESIS

It is hypothesized that there were changes in both Sinhalese and Tamil villages in the area of agriculture, public health and medical practices. These are seen in the changes in the data between 1955 and 1965 that occurred across the two ethnic villages.

It is further hypothesized that the differences between these villages--that is to say their history, geography, tradition, culture and socio-economics--

have influenced the adoption of the recommended practices mentioned above.

OPERATIONAL DEFINITION OF VARIABLES

Independent Variables

Ethnic groups: The Sinhalese villages include the jungle village of Illukwewa, the hill region of Higoda and Ellagala and the irrigation colony of Hinguraka. Here the villagers speak Sinhalese language which is the national language of the country. Seventy percent of the population are Sinhalese.

The Tamil speaking villages include Idaikurichy and Varany North in Jaffna district. The Tamils are the major minority group of Ceylon. Their population is about 11 percent of the total population.

As mentioned in Chapter 2, except the jungle village of Illukwewa, the Sinhalese villages are more modern and less traditional than the two Tamil ones. Among these, the irrigation colony of Hinguraka which was built in the mid-1930's under the government policy was the wealthiest and the most modern one.

In addition, the Tamil villages in this research are located in dry desert areas and their land therefore is less productive than the other Sinhalese's.

They are also far away from the capital of Colombo and so were more neglected by the government.[1]

These traditional, historical, geographical, socio-cultural characteristics of the two ethnic villages are hypothesized as having significant influence on the adoption of recommended practices of public health, medical care and agriculture.

Year: The adoptions of recommended practices mentioned above in those Ceylon villages in 1955 are hypothesized to be significantly different from those in 1965. The time involvement of ten years should have provided improvements in the Ceylonese villagers' lives.

The Ceylon data of 1955 were collected by Sower in his research entitled The Ceylon Village Development Program, A Sociological Analysis, 1955 and that of 1965 were collected by Welikala. The data of both studies are in the form of percentage and are stored on IBM cards at Michigan State University.

Figures of 11 identical variables in both years (1955 and 1965) analyzed in the present research are shown in the Appendix.

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[1]For more details of these villages see "Description of Six Selected Villages of Ceylon," Chapter 2.

Dependent Variables

The dependent variables are the participation in the RD Society and the adoptions of recommended practices of public health, and medical care.

1. The villagers are either a member or not a member of the Rural Development Societies.

2. Recommended adoptions of public health included:

a. Types of material used in house construction: (either mud-thatch, masonry or ola thatch). There is a prestige rank of house types. Masonry construction with tiled roof has the highest prestige. The second one is mud construction together with thatched roof; and the third is attached to completely thatched (ola) construction and roof.

b. Adequacy of ventilation (either satisfactory, partially satisfactory or unsatisfactory ventilation). The standard required for satisfactory ventilation is that the area of doors and windows leading into the room should be at least one-seventh of the floor area of that room. Any fraction below this was classified as partially adequate. Houses made of ola thatch are considered as having unsatisfactory ventilation.

c. Sources of drinking water (from either protected, partially protected or unprotected wells).

It is recommended that wells should be protected by having a proper concrete wall about three feet high and a three-foot drainage apron surrounding the wall.

d. Families who always, sometimes or never boil their drinking water.

e. Families who have or use a sanitary latrine (either water seal type or pit type instead of the unsanitary "scrub" type.

3. Recommended adoptions of medical care included:

a. Last confinement held at home or maternity house.

b. Last confinement attended by government mid-wife, government medical officer or untrained village nurse.

4. Recommended adoptions of agriculture included:

a. Extent to which paddy cultivators have a knowledge of Japanese method of cultivation (either complete and accurate knowledge, partial knowledge or no knowledge at all).

b. Cultivator's statement of average bushels produced per acre on his paddy land (10 bushels or under, from 11 to 20 bushels, from 21 to 35 bushels, from 36 to 50 bushels, or more than 51 bushels).

c. Cultivator's statement of the total bushels of paddy received from land during the previous

12 months (10 bushels or under, from 11 to 20 bushels, from 21 to 50 bushels, or more than 51 bushels).

STATISTICAL TEST ANALYSIS

Based upon the data of 11 variables available in both studies, the author used the chi-square statistic to test the null hypothesis of no difference between the two ethnic type villages and the null hypothesis of independence of the two time periods (1955 and 1965) in relation to the recommended adoptions of agriculture, public health and medical care procedures.

In other words, the research hypotheses were tested in the form of Null Hypotheses which suggested that the two independent and the several dependent variables were independent of each other.

In order to test this Null Hypothesis, a contingency table was set up by calculating the number of persons who fell in each category (called cell) as in the following example. (It is noted here that the total number of four Sinhalese villagers who belonged to the same category was grouped together in one cell, and the two other Tamil villages in another cell. The six villages were therefore compared not as six individual villages but as two ethnic groups--one Sinhalese and one Tamil.)

(Example from Table 2.1, Chapter 4.)

	Sinhalese 1955	Tamil 1955	Total
Mud-thatched	137	40	177
Masonry-tiled	83	12	95
Ola-thatched	1	74	75
Total	221	126	347

In cell 1, that means row 1 and column 1, there are 137 observed people in four Sinhalese villages who had their houses constructed with mud-thatch. This number is obtained from the following formula:

Σ (number of total observations) x (percentage)

e.g.:

Sinhalese villages	Number of observations		Percentage	
in Higoda	63	x	$\frac{73}{100}$	= 46
in Ellagala	50	x	$\frac{72}{100}$	= 36
in Hinguraka	92	x	$\frac{32}{100}$	= 29
in Illukwewa	27	x	$\frac{92}{100}$	= 26
			Total	137

The test determines if the two groups differed in considering type of materials used for house construction.

The null hypothesis of no difference may be tested by:

$$\chi^2 = \sum_{i=1}^{k} \frac{(ni - \hat{E}(ni))^2}{\hat{E}(ni)} \quad (1)$$

where: ni = number observed in each cell

$\hat{E}ni$ = number of people expected in each cell

$\sum_{i=1}^{k}$ = summation of the components of χ^2 (from 1 to k, number of cells in each contingency table).

The Null Hypothesis would state that the proportion of Sinhalese villagers and that of Tamils are the same in terms of having their houses constructed by mud-thatch. The same idea works for masonry-tile and ola thatch rows.

With such a null hypothesis, the investigator can determine the expected frequency for each cell by the method described in the following table:

	Sinhalese 1955	Tamil 1955	Total
Mud-thatched	137 (112.7)[2]	40 (64.2)	177
Masonry-tiled	83 (60.5)	12 (34.5)	95
Ola-thatched	1 (47.7)	74 (27.2)	75
Total	221	126	347

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[1]William Mendenh, Introduction to Probability and Statistics, 2nd edition, Wadsworth Publishing Company, Inc., Belmont, California, 1967, Chapter II, p. 256.

[2]The expected value of cell 1.

For the cell 1 the expected value or frequency can be calculated by multiplying the two marginal totals common to that cell (i.e., total of row 1 x total of column 1) and then dividing this product by the total frequency (i.e., the total number of two groups).

For example, the expected value of cell 1 is formed as follows:

$$En1 = \frac{(r1)(c1)}{n}^{(1)} = \frac{177 \times 221}{347} = 112.7$$

The same formula is used for Ên2, Ên3 and Ên4.

If the observed frequencies are in close agreement with the expected values, the difference (ni - Eni) will be small and therefore the value of χ^2 will be small. A small value of the calculated χ^2 would not reject the null hypothesis of no difference. If the differences of these cells are large, then the value of the calculated chi-square will be large; if it is larger than a predetermined critical value of the χ^2, the null hypothesis of no difference will be rejected.

In order to find the critical value of the χ^2, the degrees of freedom must be known. The degree of freedom of a contingency table is calculated by this formula:

$$df = (r-1)(c-1)^{(2)}$$

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[1] Ibid., p. 258.

[2] Ibid., p.

where: r = number of rows

c = number of columns

For example, in the Table 2.1 mentioned above, we have r = 2 (two ethnic villages), c = 3 (three types of house materials of construction). Consequently, the degree of freedom is equal to two.

$$[df = (2-1)(3-1) = 2]$$

The calculated value of χ^2 in that table is computed by:

$$\chi^2 = \sum_{i=1}^{k} \frac{(ni - \hat{E}ni)^2}{\hat{E}ni}$$

Following this formula, the author substracts the expected value from the observed frequencies; then squares the substracted total, and then divides the total by the expected value. The same thing is done for all six cells. Finally we obtain:

$$\chi^2 = \frac{(137 - 112.7)^2}{112.7} + \frac{(83 - 60.5)^2}{60.5} + \frac{(1 - 47.7)^2}{47.7}$$

$$+ \frac{(40 - 64.2)^2}{64.2} + \frac{(12 - 34.5)^2}{34.5} + \frac{(74 - 27.2)^2}{27.2}$$

$$= 5.19 + 8.36 + 45.91 + 9.12 + 14.67 + 80.52 = 163.77$$

$$\chi^2 = 163.77$$

In order to determine the significance of this calculated χ^2, the author used a Chi-square table. It showed in this table that the critical value of the χ^2 for three degrees of freedom at the .01 level of significance is 09.21.

The calculated χ^2 = 163.80 is larger than the critical value and therefore the null hypothesis of no difference is rejected.

Chapter 4

RESULTS AND PRESENTATION OF THE DATA

The background of the present study has been reviewed; the method of collecting the data in the original studies was described; and the method of analyzing the data was explained. In this chapter the results of the present study are presented.

Table 1.1 Number of persons in Sinhalese and Tamil villages who are members and non-members of the RDS in 1955

	Sinhalese 1955	Tamil 1955	Total
RDS member	168 (159.2)*	135 (143.8)	303
Not RDS member	49 (57.8)	61 (52.2)	110
Total	217	196	413

*Where the number given in parentheses is the expected frequency.

$$\chi^2 = 3.85$$

χ^2 required at .01 level = 6.63.

As mentioned in the original study of Sower (1955) the villages selected for the study were based on the

criterion that one village had a successful RDS, one an unsuccessful RDS and others were at the mid-points.

In the Tamil villages, Idaikurichy was selected as a model village where serious efforts had been made to demonstrate what should be accomplished in such a village. Varany North, in contrast, was unsuccessful in its RDS work.[1]

In the meantime four other Sinhalese villages were selected as villages where the RDS was at the mid-point on the continuum of success.

Therefore the difference between the Sinhalese and Tamil villagers in terms of membership in the RDS in 1955 proved to be non-significant at the .01 level.

Table 1.2 Number of persons in Sinhalese and Tamil villages who are members and non-members of the RDS in 1965

	Sinhalese 1965	Tamil 1965	Total
RDS member	215 (193.6)	18 (39.4)	233
Not RDS member	80 (101.4)	42 (20.6)	122
Total	295	60	355

$\chi^2 = 40.64$

χ^2 required at .01 level = 6.63.

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[1]The contrasting percentages of RDS membership, 69% for Idaikurichy and 19% for Varany North, provides the evidence that the villages were contrasting in this respect.

In 1965 the difference between these two types of ethnic villages proved to be significant with a χ^2 of 40.64.

The reason is shown in Tables 1.3 and 1.4. During the period of 10 years (from 1955 to 1965) the percentage of the Sinhalese villagers who participated in the RDS stayed essentially the same as evidenced by the non-significant $\chi^2 = 1.36$ (Table 1.3) while in Tamil villages, the difference between the two time periods proved very significant with a χ^2 of 36.30 (Table 1.4) as the percentage of Tamil villagers who participated in the RDS decreased from 1955 to 1965.

In 1955 there were 135 RDS members as compared to 61 non-members while in 1965 there were only 18 RDS members as compared to 42 non-members.

Table 1.3 Number of persons in the Sinhalese villages who are members and non-members of the RDS in 1955 and 1965

	Sinhalese 1955	Sinhalese 1965	Total
RDS member	168 (162.3)	215 (220.7)	383
Not RDS member	49 (54.7)	80 (74.3)	129
Total	217	295	512

$\chi^2 = 3.85$

χ^2 required at .01 level = 6.63.

Table 1.4 Number of persons in the Tamil villages who are members and non-members of the RDS in 1955 and 1965

	Tamil 1955	Tamil 1965	Total
RDS member	135 (117.1)	18 (35.8)	153
Not RDS member	61 (78.8)	42 (21.1)	103
Total	196	60	256

$\chi^2 = 40.64$

χ^2 required at .01 level = 6.63.

One possible explanation for the decrease of RDS membership in the Tamil villages is that the RDS in general were not successful during the 1960's.[1] The further the villages are from the central government the less successful the RDS tend to be. Tamil villages, as mentioned in Chapter 2, are located on the top of Ceylon which are very far from Colombo, the Ceylon capital. They were neglected by government aid more than the Sinhalese villages.

Tamil villages are also poorer and more traditional than the Sinhalese villages[2] and so they tend not to adopt new ideas as easily.

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[1] Report of Rural Development Evaluation Mission in Ceylon, United Nations, 1962, p. 67.

[2] See Chapter 2, "Description of Tamil Villages."

Moreover, Sinhalese people are Buddhist in religion; consequently they believe in working for the RDS to get merit toward a better rebirth.[1]

EXTENT OF THE ADOPTION OF HEALTH PRACTICES

Tables 2.1 through 2.4 show a very significant difference between the Sinhalese and Tamil villages in terms of types of materials used in house construction.[2]

Table 2.1 Types of material used in house construction in Sinhalese and Tamil villages in 1955

	Sinhalese 1955	Tamil 1955	Total
Mud-thatched	137 (112.7)	40 (64.2)	177
Masonry-tiled	83 (60.5)	12 (34.5)	95
Ola-thatched	1 (47.7)	74 (27.2)	75
Total	221	126	347

$\chi^2 = 163.77$

χ^2 required at .01 level = 9.21.

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[1]Christopher Sower, op. cit., p. 254.

[2]It was recommended by the government that houses should be built with material which is satisfactory by health standards. According to this, there is a prestige rank of house types. Masonry construction with tiled roof has the highest prestige. Second is a mud construction together with thatched roof; and third is attached to completely thatched (ola) construction and roof.

It is observed that in 1955 there were more masonry-tiled and mud-thatched but less ola-thatched houses in Sinhalese villages than in Tamil villages. Only one Sinhalese house was built by completely ola thatch as compared to 83 in masonry-tiled while there were 74 Tamil houses built with ola-thatch as compared to 12 built with masonry.

Table 2.2 Types of material used in house construction in Sinhalese and Tamil villages in 1965

	Sinhalese 1965	Tamil 1965	Total
Mud-thatched	130 (136.6)	57 (49.4)	186
Masonry-tiled	118 (98.4)	16 (35.5)	134
Ola-thatched	1 (13.9)	18 (5.0)	19
Total	249	90	339

$\chi^2 = 61.71$

χ^2 required at .01 level = 9.21.

In 1965, the same observation was noted. The calculated χ^2 is significant at the .01 level.

The possible explanations for this wide range of difference are that:

1. Jaffna area where occupied by the two Tamil villages (Idaikurichy and Varany North) produced a lot of ola-thatch (from palmyrah palm) which is light, cheap and very appropriate for the house construction in the

dry climate and low elevation of that region. In contrast, Sinhalese villages were located mostly in the wet zone and high elevation[1] where such light material of construction (ola-thatch) is inappropriate.

2. The Tamil Hindu villagers were less wealthy and more traditional than the Sinhalese villagers were in general; consequently masonry-tiled houses were not popular in the Tamil villages as they were in the Sinhalese ones, especially in the irrigation colony of Hinguraka--the most modern and wealthy village of all--it was observed in 1955 that there were 64% and 77% in 1965 of the total houses in Hinguraka village built with masonry as compared to 1% of ola-thatch.

Table 2.3 Types of material used in house construction in Sinhalese villages in 1955 and 1965

	Sinhalese 1955	Sinhalese 1965	Total
Mud-thatched	137 (125.5)	130 (141.4)	267
Masonry-tiled	83 (94.5)	118 (106.5)	201
Ola-thatched	1 (.9)	1 (1.1)	2
Total	221	249	470

$\chi^2 = 4.63$

χ^2 required at .01 level = 9.21.

[1]Ellagala and Higoda are located on the hillsides (2,000 feet high). Here the weather is colder and damper than in the Tamil dry villages.

It is observed in Table 2.3 that the time involvement made a small change in the Sinhalese villages in terms of materials used in house construction. However, the difference between the two time periods (from 1955 to 1965) was very slight. The calculated χ^2 is non-significant at the .01 level. Therefore, the null hypothesis of no difference is not rejected.

Table 2.4 Types of material used in house construction in Tamil villages in 1955 and 1965

	Tamil 1955	Tamil 1965	Total
Mud-thatched	40 (56.0)	56 (40.0)	96
Masonry-tiled	12 (16.3)	16 (11.6)	28
Ola-thatched	74 (53.6)	18 (38.3)	92
Total	126	90	216

$\chi^2 = 32.31$

χ^2 required at .01 level = 9.21.

The calculated χ^2 shows that the difference between 1955 and 1965 in the Tamil villages was very significant at the .01 level.

In 1955 more Tamil houses were built with ola-thatch than with mud-thatch and masonry but in 1965 there were more mud-thatched houses than ola-thatched ones. In 1955 there were 74 houses built with ola-thatch as

compared to 40 mud-thatched, whereas in 1965 there were 18 with ola-thatch as compared to 56 mud-thatched.

Tables 3.1 through 3.4 present data concerning the problem of adequacy of ventilation determined by the health department. "The standard required for complete adequacy is that the area of doors and windows leading into the room should be at least one-seventh of the floor area of that room. Any fraction below this was classified as only partially adequate. The room which had no windows in it, only a small door, was considered unsatisfactory."[1]

Table 3.1 Adequacy of ventilation of houses in Sinhalese and Tamil villages in 1955

Adequacy of Ventilation	Sinhalese 1955	Tamil 1955	Total
Satisfactorily ventilated	211 (196.3)	180 (194.6)	391
Partially satisfactory	11 (12.5)	14 (12.4)	25
Unsatisfactory	4 (17.1)	30 (16.9)	34
Total	226	224	450

$\chi^2 = 22.74$

χ^2 required at .01 level = 9.21.

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[1]Christopher Sower, op. cit., p. 96.

The calculated χ^2 shows that the difference between the two groups was very significant. The hypothesis that there is a relationship between the low status housing and inadequate ventilation is shown to be true. In Tables 2.1 and 2.2 the Tamil villages showed to have more low status housing (ola-thatch); consequently they had the lowest rate of housing ventilation adequacy (Tables 3.1 and 3.2).[1] In 1955 only four Sinhalese houses were classified as having unsatisfactory ventilation as compared to 211 of satisfactory ventilation while in Tamil villages 30 were rated as unsatisfactory ventilation as compared to 180 satisfactory.

Table 3.2 Adequacy of ventilation of houses in Sinhalese and Tamil villages in 1965

Adequacy of Ventilation	Sinhalese 1965	Tamil 1965	Total
Satisfactory	130 (116.2)	34 (47.7)	164
Partially satisfactory	55 (66.6)	39 (27.3)	94
Unsatisfactory	22 (24.1)	12 (9.9)	34
Total	207	85	292

$\chi^2 = 13.21$

χ^2 required at .01 level = 9.21.

[1] It is supposed to have a considerable amount of ventilation through the thatch even if there are no windows. However, this type of construction was coded as having unsatisfactory ventilation.

Table 3.2 was quite similar to Table 3.1. It is noticed that in 1965 Sinhalese dwellers also had more satisfactory and less unsatisfactory ventilation than the Tamils did. However, the gap in 1965 was less than in 1955. The calculated χ^2 of 1965 was 13.21 as compared to 22.74 in 1955.

Table 3.3 Adequacy of ventilation of houses in Sinhalese villages in 1955 and 1965

Adequacy of Ventilation	Sinhalese 1955	Sinhalese 1965	Total
Satisfactory	211 (231.4)	130 (211.9)	341
Partially satisfactory	11 (44.8)	55 (41.0)	66
Unsatisfactory	4 (17.6)	22 (16.1)	26
Total	226	207	333

$\chi^2 = 76.38$

χ^2 required at .01 level = 9.21.

Table 3.3 and 3.4 show a decrease of satisfactory ventilation and an increase of unsatisfactory ventilation in 1965 in both ethnic villages.

In 1955 there were four out of 226 Sinhalese villagers who responded as having unsatisfactory ventilation as compared to 22 out of 207 Sinhalese who were listed in the unsatisfactory category in 1965.

The difference between the two time periods was significant at the .01 level.

Table 3.4 Adequacy of ventilation of houses in Tamil villages in 1955 and 1965

Adequacy of Ventilation	Tamil 1955	Tamil 1965	Total
Satisfactory	180 (155.1)	34 (58.8)	214
Partially satisfactory	14 (38.4)	39 (14.6)	53
Unsatisfactory	30 (30.4)	12 (11.5)	42
Total	224	85	309

$\chi^2 = 71.35$

χ^2 required at .01 level = 9.21.

The same observations happened in the Tamil villages. It is also indicated that in 1955 there were many more houses with satisfactory ventilation than partially satisfactory but in 1965 the situation seemed to be reversed.

Tables 4.1 through 4.4 present data on the sources of drinking water. One of the major health practices recommended by the Ceylon government was concerned with the drinking of pure and safe water from protected wells.

Under the government recommendation, wells were to be protected by having a proper concrete wall about

three feet above ground level with a three-foot drainage apron surrounding the wall.[1] This well was either built by the government or the Rural Development Societies. Therefore the extent of use of drinking water from fully protected wells was related to the government funds contributed to build such wells.

Table 4.1 Sources of drinking water in Sinhalese and Tamil villages in 1955

Source of Water	Sinhalese 1955	Tamil 1955	Total
Protected well	76 (50.8)	23 (48.1)	99
Partially protected	21 (88.8)	152 (84.1)	173
Unprotected	110 (67.2)	21 (63.7)	131
Total	207	196	403

$$\chi^2 = 182.17$$

χ^2 required at .01 level = 9.21.

The calculated χ^2 shows a big difference between the two groups in the source of drinking water.

It was found that Sinhalese villagers used water from the unprotected wells much more than the others did. In 1955 there were 110 out of 207 observed

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[1]Christopher Sower, op. cit., p. 104.

Sinhalese who used water from unprotected wells as compared to 21 out of 196 observed Tamils who responded as using water from unprotected wells.

Table 4.2 Sources of drinking water in Sinhalese and Tamil villages in 1965

	Sinhalese 1965	Tamil 1965	Total
Protected well	94 (132.9)	91 (52.0)	185
Partially protected	20 (16.5)	3 (6.4)	23
Unprotected	131 (95.5)	2 (37.4)	133
Total	245	96	341

$\chi^2 = 89.88$

χ^2 required at .01 level = 9.21.

The null hypothesis of no difference between these two ethnic villages is rejected (Table 4.2). The Tamils appeared to use water from fully protected wells much more than the Sinhalese did.

In 1965, 91 Tamils were listed as using water from protected wells as compared to two Tamils in "unprotected wells" category while 94 Sinhalese answered as using water from protected wells as compared to 131 in "unprotected wells" category.

This difference could be explained by the fact that Tamil villages had no rivers and no tanks for reserve

water as the Sinhalese did.[1] Consequently wells were more popular in the Tamil areas than in the Sinhalese.

Table 4.3 Sources of drinking water in Sinhalese villages in 1955 and 1965

	Sinhalese 1955	Sinhalese 1965	Total
Protected well	76 (77.8)	94 (92.1)	170
Partially protected	21 (18.8)	20 (22.2)	41
Unprotected	110 (110.3)	131 (130.6)	241
Total	207	245	452

$\chi^2 = .55$

χ^2 required at .01 level = 9.21.

The calculated χ^2 is too small to be significant at the .01 level (Table 4.3). This means that the differences in the Sinhalese from 1955 to 1965 were very slight. It would stand to reason that the Sinhalese villagers didn't care much about water from wells because other sources of water such as tanks, rivers, etc. were available in their areas.

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[1]See "Description of Six Selected Villages," Chapter 2.

Table 4.4 Sources of drinking water in Tamil villages in 1955 and 1965

	Tamil 1955	Tamil 1965	Total
Protected well	23 (76.5)	91 (37.4)	114
Partially protected	152 (104.0)	3 (50.9)	155
Unprotected	21 (15.4)	2 (7.5)	23
Total	196	96	292

$\chi^2 = 187.36$

χ^2 required at .01 level = 9.21.

The calculated χ^2 rejects the null hypothesis of no difference. It is interesting to note that the Tamil villagers used more and more water from fully protected wells.

In 1955 there were 23 villagers in the "protected wells" cell as compared to 21 persons in "unprotected wells" while in 1965 there were 91 in the "protected wells" cell as compared to only two in the "unprotected wells" cell.

One possible explanation for this change is that in 1965 more protected wells were built in this region where there was no other way of getting water except wells.

Tables 5.1 through 5.4 present data on the difference of these groups on the extent to which their villagers boil their drinking water.

It was recommended that all drinking water should be boiled even that which comes from the fully protected wells for fear of disease. But it appears that the average villager does not seem to understand more than the mere surface level of the germ theory of disease.

It was found in Table 5.1 that in the Sinhalese as well as in the Tamil villages those who "never" boil their drinking water always exceed the number of those who "sometimes" or "always" boil their drinking water.

Table 5.1 Families who boiled their drinking water in Sinhalese and Tamil villages in 1955

	Sinhalese 1955	Tamil 1955	Total
Always boil	36 (45.5)	66 (56.5)	102
Sometimes boil	72 (58.4)	59 (22.0)	131
Never boil	87 (91.0)	117 (112.9)	204
Total	195	242	437

$$\chi^2 = 89.56$$

χ^2 required at .01 level = 9.21.

It seemed that in 1955 more Tamil villagers boiled their drinking water than did the Sinhalese.

The same observation is shown in Table 5.2. It is also interesting to note that this table is consistent with Tables 4.1 and 4.2 which indicate the sources of

drinking water. It was hypothesized that there was a correlation between the extent of boiling the drinking water and the source of drinking water. While it is impossible to make the cross-runs of the data to know if those families who got water from protected wells did or did not boil their water we still can find in this Table (5.2) that the Tamils who had more protected wells than the Sinhalese seemed to never boil their drinking water more than the others.

Table 5.2 Families who boiled their drinking water in Sinhalese and Tamil villages in 1965

	Sinhalese 1965	Tamil 1965	Total
Always boil	54 (41.1)	3 (15.8)	57
Sometimes boil	75 (82.2)	39 (31.7)	114
Never boil	117 (122.6)	53 (47.3)	170
Total	246	95	341

$$\chi^2 = 17.83$$

χ^2 required at .01 level = 9.21.

The calculated χ^2 is significant at the .01 level. Therefore the null hypothesis of no difference is rejected.

In 1965 there were 54 Sinhalese families who always boiled their drinking water as compared to 117 families who never boiled their water whereas there were only

three Tamil families who boiled their water as compared to 53 families who never boiled it.

Table 5.3 Families who boiled their drinking water in Sinhalese villages in 1955 and 1965

	Sinhalese 1955	Sinhalese 1965	Total
Always boil	36 (39.8)	54 (50.2)	90
Sometimes boil	72 (65.0)	75 (82.0)	147
Never boil	87 (90.2)	117 (113.8)	204
Total	195	246	441

$\chi^2 = 3.38$

χ^2 required at .01 level = 9.21.

The calculated χ^2 shows that the difference during the two time periods was non-significant at the .01 level. It means that the Sinhalese families seemed to not understand the germ theory of disease caused by the drinking of unboiled water and seemed to ignore the government's recommendations and continued to drink unboiled water from 1955 until 1965.

It is observed in this table that in 1965 the number of families who never boiled their drinking water still exceeded the number of those who sometimes and who always did.

Table 5.4 Families who boiled their drinking water in Tamil villages in 1955 and 1965

	Tamil 1955	Tamil 1965	Total
Always boil	66 (49.5)	3 (19.5)	69
Sometimes boil	59 (70.3)	39 (27.6)	98
Never boil	117 (122.0)	53 (47.9)	170
Total	242	95	337

$\chi^2 = 26.73$

χ^2 required at .01 level = 9.21.

The calculated χ^2 shows that there was a significant difference in the Tamil families after a period of 10 years (from 1955 to 1965) in terms of having their drinking water boiled.

However, instead of making improvements they seemed to never boil their drinking water more often in 1965 than in 1955 and vice versa. In 1965 there were only three families out of 95 families as compared to 66 out of 242 families in 1955 who always boiled their drinking water.

Another health practice which was directly related to the availability of the government funds was the construction of sanitary latrines (either water seal type or pit type) in order to alter the traditional

pattern of using unsanitary "scrub" which polluted the water supplies.

Table 6.1 Families which had a sanitary latrine and families which customarily used a latrine in Sinhalese and Tamil villages in 1955

	Sinhalese 1955	Tamil 1955	Total
Had sanitary latrine	129 (137.5)	72 (63.5)	201
Used latrine	118 (109.5)	42 (50.5)	160
Total	247	114	361

$\chi^2 = 3.77$

χ^2 required at .01 level = 6.63.

The calculated χ^2 is too small to reject the null hypothesis of no difference. It could be explained that there were less sanitary latrines in the Sinhalese villages but more Sinhalese families used such latrines than the Tamils did. It sounds strange but it is very interesting to note that the construction of sanitary latrines did not assure the usage of such new patterns unless it was accompanied by an education and involvement program.[1]

The use of sanitary latrines also involved the social, cultural and regional aspects. The families

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[1]Christopher Sower, op. cit., p.

in Illukwewa, Idaikurichy and Varany North were observed to have less percentage using latrines than the other villages.

It is indicated that in 1955 there were 11% in Illukwewa, 21% in Idaikurichy and 2% in Varany North listed as using latrines as compared to 51% in Higoda, 58% in Ellagala and 59% in Hinguraka.

The same observation was shown in 1965. There were 9% in Illukwewa, 9% in Idaikurichy and 11% in Varany North as compared to 60% in Higoda, 76% in Ellagala and 70% in Hinguraka.

It is evident that Illukwewa and the two Tamil villages which are located in the jungle and desert area are less crowded and consequently their houses, covered with scrub provided a lot of privacy for the traditional pattern of elimination. Obviously the need for the latrine was not felt by these people to whom the scrub jungle nearby served the purpose equally well.[1]

In contrast, the villages of Higoda, Ellagala and Hinguraka are somewhat more crowded.[2] There was little

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[1]George Welikala, op. cit., p. 95.

[2]The population density was about 650 persons per square mile.

or no privacy near each house; hence the use of a latrine was needed.

Table 6.2 Families which had a sanitary latrine and families which customarily used a latrine in Sinhalese and Tamil villages in 1965

	Sinhalese 1965	Tamil 1965	Total
Had a sanitary latrine	157 (158.8)	13 (11.2)	170
Used latrine	169 (167.2)	10 (11.8)	179
Total	326	23	349

$\chi^2 = .60$

χ^2 required at .01 level = 6.63.

Table 6.2 was quite similar to Table 6.1. The null hypothesis of no difference is not rejected at the .01 level. The same observation and the same explanation as given for 1955 also seemed to be in effect in 1965.

Table 6.3 Families which had a sanitary latrine and families which customarily used a latrine in Sinhalese villages in 1955 and 1965

	Sinhalese 1955	Sinhalese 1965	Total
Had a latrine	129 (123.3)	157 (162.7)	286
Used latrine	118 (123.7)	169 (163.3)	287
Total	247	326	573

$\chi^2 = 0.93$

χ^2 required at .01 level = 6.63.

The calculated χ^2 shows that the differences between 1955 and 1965 were very slight. However, from the original data it was observed that Hinguraka, Higoda and Ellagala families did make fair improvements in the use of latrines (see the explanation of Table 6.1) while only the families in the jungle village of Illukwewa decreased terribly in the building and use of latrines. In 1955 there were 88% of the total families observed having latrines but in 1965 there were only 9%. In 1955 11% were listed as using sanitary latrines but in 1965 the percentage was down to 9%. This decrease made the improvement in three other Sinhalese villages non-significant.

Table 6.4 Families which had a sanitary latrine and families which customarily used a latrine in Tamil villages in 1955 and 1965

	Tamil 1955	Tamil 1965	Total
Had a latrine	72 (70.7)	13 (14.3)	85
Used latrine	42 (43.2)	10 (8.7)	52
Total	114	23	137

$\chi^2 = 0.37$

χ^2 required at .01 level = 6.63.

After a period of ten years (from 1955 to 1965) the percentage of the Tamil families which had and used a

latrine seemed to stay the same as the calculated χ^2 is non-significant at .01 level.

ADOPTION OF RECOMMENDED MEDICAL CARE

Tables 7.1 through 7.4 present data on the question of whether the last confinement was held at home or at a maternity house. Here the Ceylon villagers' conception of beliefs, sentiments, values and practices regarding health problems were observed.

It is of special interest that even though the Public Health Department had advocated the use of free Western medical services,[1] the Ceylon villages still believed in the traditional Ayurdic medicine.[2]

The more traditional the villagers are, the more they trust the traditional medicine and traditional physicians. And the more they believe in the traditional medicine, the more they have confinement at home.

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[1]The free Western medical service was assisted by the government medical officer (or apothecary who is trained to perform minor medical service under the medical officer's jurisdiction) and the government mid-wives who deliver babies.

[2]This word means "the book of Hindu Science of Health and Medicine."

Table 7.1 Last confinements held at home or at maternity houses in Sinhalese and Tamil villages in 1955

	Sinhalese 1955	Tamil 1955	Total
Confinement at home	58 (80.5)	223 (200.4)	281
At maternity house	48 (25.5)	41 (63.5)	89
Total	106	264	370

$\chi^2 = 36.66$

χ^2 required at .01 level = 6.63.

This hypothesis seems to be true as Table 7.1 indicates that Tamil women preferred to have confinements at home more than the Sinhalese did.

In 1955 there were 223 confinements at home as compared to only 41 at maternity houses for Tamil women while there were only 58 confinements at home as compared to 48 at maternity houses for Sinhalese women.

Another possible explanation is that there was no hospital available in Idaikurichy village.[1] Women in this village had to go to Varany North which is three miles away. It seemed too far for them since they had no transportation except to walk. For that reason, it is possible that Idaikurichy villagers preferred to stay

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[1]George Welikala, op. cit., p. 56.

home and had confinement at home where the untrained village nurse was readily available. In the meantime they could take care of their other children.

Table 7.2 Last confinement held at home or at maternity houses in Sinhalese and Tamil villages in 1965

	Sinhalese 1965	Tamil 1965	Total
Confinement at home	53 (80.2)	63 (35.7)	116
At maternity house	120 (92.7)	14 (41.3)	134
Total	173	77	250

$\chi^2 = 56.18$

χ^2 required at .01 level = 6.63.

In 1965 the difference between the two ethnic villages in terms of having confinement at home or at maternity houses was very significant with a χ^2 of 56.18.

It is indicated in Table 7.2 that in 1965 there were 120 Sinhalese women who had confinement at maternity houses as compared to only 53 "at home" while there were only 14 Tamil women at maternity houses as compared to 63 "at home."

Table 7.3 Last confinements held at home or at maternity houses in Sinhalese villages in 1955 and 1965

	Sinhalese 1955	Sinhalese 1965	Total
Confinement at home	58 (42.1)	53 (68.8)	111
At maternity house	48 (63.8)	120 (104.2)	168
Total	106	173	279

$\chi^2 = 15.94$

χ^2 required at .01 level = 6.63.

The null hypothesis of no difference is rejected since the calculated χ^2 is bigger than the critical value at the .01 level. It is observed that there were improvements in the Sinhalese women in terms of medical practices. In 1965 more Sinhalese women went to maternity houses for confinement than they did in 1955.

Table 7.4 Last confinements held at home or at maternity houses in Tamil villages in 1955 and 1965

	Tamil 1955	Tamil 1965	Total
Confinement at home	223 (221.4)	63 (64.6)	286
At maternity house	41 (42.6)	14 (12.4)	55
Total	264	77	341

$\chi^2 = 0.32$

χ^2 required at .01 level = 6.63.

After a period of ten years (from 1955 to 1965) the Tamil women who had confinements at home or maternity houses stayed the same as evidenced by the non-significant χ^2 (Table 7.4).

Tables 8.1 through 8.4 present data which are related to the previous tables (7.1 through 7.4). That is whether the confinements were attended by government mid-wives, the village untrained nurse or government medical officers.

The medical officer is supposed to be rated as the highest rank, next is the government mid-wife and last of all is the untrained village nurse.

It is hypothesized that there is a correlation between Table 8.1 and 7.1. Due to the lack of data the author cannot test this hypothesis. However, it appears in Table 8.1 that the Tamil speaking women who had confinement at home more often than did the Sinhalese women (Table 7.1) seemed to have confinements attended by the untrained village nurses more than the others.

In 1955 there were 125 confinements attended by village nurses as compared to 21 by government mid-wives and 25 by government medical officers while for Sinhalese women there were only 37 confinements by village nurses as compared to 38 by government mid-wives and 11 by government medical officers.

As the government mid-wives were not residents of the village itself, it's likely that the villagers went to the village nurses who were always ready on the spot.

Table 8.1 Last confinement attended by either government mid-wife, village untrained nurse or government medical officer in Sinhalese and Tamil villages in 1955

	Sinhalese 1955	Tamil 1955	Total
Government mid-wife	38	21	59
Village nurse	37	125	162
Government medical officer	11	25	36
Total	86	171	257

$\chi^2 = 33.78$

χ^2 required at .01 level = 9.21.

In 1965 the difference between these two ethnic villages was evidenced by the significant χ^2 of 103.78 (Table 8.2). The null hypothesis is therefore rejected. This table is consistent with Table 7.2.

Table 8.2 Last confinement attended by either government mid-wife, untrained nurse or government medical officer in Tamil and Sinhalese villages in 1965

	Sinhalese 1965	Tamil 1965	Total
Government mid-wife	57 (42.5)	4 (18.5)	61
Village nurse	37 (73.1)	68 (31.8)	105
Government medical officer	76 (54.3)	2 (23.6)	78
Total	170	74	244

$\chi^2 = 103.78$

χ^2 required at .01 level = 9.21.

Table 8.3 shows a great deal of improvement was made by the Sinhalese women in terms of adopting the public health service. The percentage of confinements attended by untrained village nurses gradually decreased from 1955 to 1965.

In 1955 there were 37 confinements attended by village nurses as compared to 11 by government medical officers while in 1965 there were also 37 confinements attended by village nurses as compared to 76 by government medical officers.

Table 8.3 Last confinement attended by either government mid-wife, untrained nurse or government medical officer in Sinhalese villages in 1965

	Sinhalese 1955	Sinhalese 1965	Total
Government mid-wife	38 (31.9)	57 (63.0)	95
Village nurse	37 (24.8)	37 (49.1)	74
Government medical officer	11 (29.2)	76 (57.8)	87
Total	86	170	256

$\chi^2 = 27.79$

χ^2 required at .01 level = 9.21.

The difference was significant with a χ^2 of 27.79.

Table 8.4 Last confinement attended by either government mid-wife, untrained village nurse or government medical officer in Tamil villages in 1965

	Tamil 1955	Tamil 1965	Total
Government mid-wife	21 (17.4)	4 (7.5)	25
Village nurse	125 (134.7)	68 (58.3)	193
Government medical officer	25 (18.8)	2 (8.1)	27
Total	171	74	245

$\chi^2 = 11.32$

χ^2 required at .01 level = 9.21.

The calculated χ^2 shows that the difference in the Tamil villages from 1955 to 1965 was significant. However, they changed in an opposite direction than did the Sinhalese villagers. While in 1965 the percentage of confinements attended by untrained village nurses decreased for Sinhalese women, they tended to increase for Tamil villagers. It is observed in Table 8.4 that in 1965 there were 68 confinements attended by village nurses as compared to two by government medical officers and four by government mid-wives while in 1955 there were 125 attended by village nurses as compared to 25 by government medical officers and 21 by government mid-wives.

ADOPTION OF AGRICULTURE PRACTICES

Table 9.1 through 9.4 present data on the Ceylonese's knowledge of the Japanese method of cultivation.

It is necessary to have a few notes on this method of cultivation for the readers' knowledge.

During 1954 the Field Division carried out an extensive propaganda for popularizing better products of cultivation by adopting the Japanese method which yielded more bushels of paddy per acre (about 70 bushels/acre) within the shortest time.

The traditional method of planting paddy has been to work the soil into a thin mud, and then to broadcast the seed into this mixture. The Japanese method consists of essentially the same method of preparing the soil but a quite different way of transplanting the rice plants from the traditional method.

The seeds are transplanted in rows, six inches apart in 12-inch rows. This process of transplanting the paddy plant makes it grow more shoots and thereby is more productive.[1] This transplanting method also facilitates the weeding process, especially with the small weeding implement.

Tables 9.1 and 9.2 show that the Ceylon villagers seemed to have no accurate knowledge of the Japanese method of cultivation at all even though the results of this method were demonstrated and the cultivators were instructed on how to apply this method in agriculture.

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[1] "It may yield an average of 70 bushels per acre in comparison with the average of 30 bushels in the traditional method," extracted from Grow Rice the Japanese Way, Circular Bulletin, No. 26, Dept. of Agriculture, Peradeniya, Ceylon.

Table 9.1 Extent to which paddy cultivators had knowledge of the Japanese method of paddy cultivation in Sinhalese and Tamil villages in 1955

	Sinhalese 1955	Tamil 1955	Total
Partial knowledge	57 (29.5)	5 (32.4)	62
No knowledge	128 (154.5)	196 (169.5)	324
Complete knowledge	0 (.9)	2 (1.0)	2
Total	185	203	388

$\chi^2 = 59.39$

χ^2 required at .01 level = 9.21.

In 1955 only 57 out of 185 Sinhalese cultivators and only five out of 203 Tamil cultivators had a partial knowledge of this method. The rest had no knowledge at all. However, the Sinhalese cultivators seemed to have a greater percentage who had partial knowledge of that method than did the Tamil cultivators. The difference was significant at the .01 level with a χ^2 of 59.39.

Table 9.2 Extent to which paddy cultivators had knowledge of the Japanese method of paddy cultivation in Sinhalese and Tamil villages in 1965

	Sinhalese 1965	Tamil 1965	Total
Partial knowledge	31 (28.5)	0 (1.0)	31
No knowledge	118 (119.6)	12 (10.4)	130
Complete knowledge	1 (1.8)	1 (.1)	2
Total	150	13	163

$\chi^2 = 9.94$

χ^2 required at .01 level = 9.21.

In 1965 the difference between the two ethnic villages was significant with a χ^2 of 9.94.

However, the gap was less in 1965 than in 1955 (the calculated χ^2 of Table 9.1 is 59.39). The possible explanation is shown in Table 9.3 and 9.4 which indicate that in 1965 the percentage of Sinhalese and Tamil cultivators with "no knowledge" of the Japanese method was almost equally large.

Table 9.3 Extent to which Sinhalese paddy cultivators had knowledge of the Japanese method of paddy cultivation in 1955 and 1965

	Sinhalese 1955	Sinhalese 1965	Total
Partial knowledge	57 (48.6)	31 (39.4)	88
No knowledge	128 (135.8)	118 (110.2)	246
Complete knowledge	0 (.5)	1 (.5)	1
Total	185	150	335

$\chi^2 = 10.65$

χ^2 required at .01 level = 9.21

It is observed in Table 9.3 that from 1955 to 1965 there was a decrease in the percentage of Sinhalese cultivators who had a partial knowledge of the Japanese method of cultivation and an increase in "no knowledge."

In 1955 there were 57 Sinhalese cultivators in the "partial knowledge" cell as compared to 128 in the "no knowledge" cell while in 1965 there were 31 in "partial knowledge" cell and 118 in "no knowledge" cell.

The difference between the two time periods was significant at .01 level.

One possible explanation was that none of the villages studied--except Hinguraka--applied such methods of cultivation because as the villagers said, "that

method works satisfactorily only in irrigated fields where there is a plentiful supply of water throughout the growing season."[1]

The lack of adoption of this transplanting method was due to the increased amount of labor involved in the process. The farmer did not realize that the increase of labor would be compensated by the increased tilling of paddy land.

In addition, new agricultural practices frequently require some time to result in the increased production and may not be quickly observable. Nevertheless, it is interesting to note that those Ceylon cultivators preferred to adopt short-run practices to long-run procedures whose results cannot be justified right away. This is a very common feature of the villagers in under-developed countries, not only in Ceylon.

Finally, there is a tendency in the Asian villagers that they cling to their own traditional method of cultivation and against any change and new techniques.[2]

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[1] Christopher Sower, op. cit., p. 137.

[2] Some Aspects of Traditional Sinhalese Culture, A Symposium, edited by Ralph Pieris, Univ. of Ceylon, Paradeniya, 1956, p. 88.

Table 9.4 Extent to which Tamil paddy cultivators had knowledge of the Japanese method of paddy cultivation in 1955 and 1965

	Tamil 1955	Tamil 1965	Total
Partial knowledge	5 (4.7)	0 (.3)	5
No knowledge	196 (195.5)	12 (12.5)	208
Complete knowledge	2 (2.8)	1 (.2)	3
Total	203	13	216

$\chi^2 = 3.76$

χ^2 required at .01 level = 9.21.

The difference from 1955 to 1965 in the Tamil paddy cultivators who had knowledge of the Japanese method of cultivation was very slight as evidenced by the non-significant χ^2 (Table 9.4).

Tables 10.1 through 10.4 were taken from the cultivators' statement of the average number of bushels produced per acre on their paddy land.

Tables 10.1 and 10.2 show a very significant difference between Sinhalese and Tamil cultivators in terms of paddy production.

Table 10.1 Cultivator's statement of average number of bushels produced per acre on his paddy land in Sinhalese and Tamil villages in 1955

Bushels per acre	Sinhalese 1955	Tamil 1955	Total
10 or under	12 (55.6)	189 (145.3)	201
11 - 20	33 (17.1)	29 (44.8)	62
21 - 35	23 (6.9)	2 (18.1)	25
36 - 50	12 (3.9)	2 (10.1)	14
51 or more	5 (1.3)	0 (3.6)	5
Total	85	222	307

$\chi^2 = 155.80$

χ^2 required at .01 level = 13.27.

It is observed in Table 10.1 that in 1955 there were 189 Tamil cultivators who stated that their paddy land yielded only "10 or under" bushels per acre[1] as compared to "none" cultivator in the "51 or more" bushels category.

In the meantime there were only 12 Sinhalese cultivators whose yield ranged from "10 or under" bushels per acre as compared to five cultivators listed in "more than 51 bushels" category.

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[1]This yield was very low in comparison with the average yield of 30 bushels per acre reported by the Food Production Department in 1954.

Table 10.2 Cultivator's statement of average number of bushels produced per acre on his paddy land in Sinhalese and Tamil villages in 1965

Bushels per acre	Sinhalese 1965	Tamil 1965	Total
10 or under	13 (27.3)	39 (24.6)	52
11 - 20	41 (29.4)	15 (26.5)	56
21 - 35	19 (22.1)	23 (19.9)	42
36 - 50	21 (14.7)	7 (13.2)	28
51 or more	8 (8.4)	8 (7.6)	16
Total	102	92	194

$\chi^2 = 32.0$

χ^2 required at .01 level = 13.27.

The null hypothesis of no difference between the two ethnic villages is rejected. In 1965 Sinhalese paddy land seemed to yield more bushels per acre than that of the Tamils. The difference is significant with a χ^2 of 32.0.

It would stand to reason since Tamil villages are located in the dry highland zone where the soil is not good for paddy cultivation. It is observed that 43 percent was in unproductive jungles. Paddy cultivation was not the main product of this area. Here the villagers preferred to grow palm trees and coconut trees. They also engaged in a type of shifting (called chena)

cultivation.[1] Hence the paddy land yielded less than that of the Sinhalese villages.

Another possible explanation is that the rainfall in Tamil villages is very low; "the season is dry and hot all year round except 100 days per year."[2] This condition complicated by no river, no tank and inadequate practice of water collection makes the low yield in paddy cultivation evident.[3]

This low yield was also due to the unfair distribution of the number of Divisional Officers and Agrarian Services Overseers who were responsible for the guidance and supervision of the Cultivation Committee. According to the Report of the Ministry of Planning and Economic Affairs in 1964 there were 198 Cultivation Committees, five Divisional officers and 12 Agrarian Overseers per 46,522 paddy acres in Kandy (Sinhalese area) as compared to only 147 Cultivation Committees, seven Divisional officers, 15 Agrarian Overseers per 80,649 acres in Jaffna[4] (Tamil area). It is observed that the

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[1] See Chapter 2.

[2] Christopher Sower, op. cit., p. 205.

[3] S. F. De Silva, A Regional Geography of Ceylon, The Colombo Apothecaries Co., Ltd., Ceylon, 1954, p. 25.

[4] Agricultural Development Proposals (1966-1970), by the Ministry of Agriculture and Food, Ceylon Government Press, January 66, p. 118.

number of acres in the Jaffna area was almost twice that of the Kandy district but the number of Cultivation Committees was less in Jaffna than it was in Kandy.

But last of all it is probable that the heavy hand of traditional cultivating methods outweighed any other factors in determining the low productivity of paddy land in Tamil villages.[1] Tables 10.1 and 10.2 are consistent with Tables 9.1 and 9.2 which indicate that the percentage of the Tamil cultivators who had no knowledge of the Japanese method of transplanting was much larger than that of the Sinhalese.

Table 10.3 Sinhalese cultivator's statement of average number of bushels produced per acre on his paddy land in 1955 and 1965

Bushels per acre	Sinhalese 1955	Sinhalese 1965	Total
10 or under	12 (11.3)	13 (13.6)	25
11 - 20	33 (33.6)	41 (40.3)	74
21 - 35	23 (19.0)	19 (22.9)	42
36 - 50	12 (15.0)	21 (18.0)	33
over 51	5 (5.9)	8 (7.1)	13
Total	85	102	187

$\chi^2 = 2.91$

χ^2 required at .01 level = 13.27.

[1] Christopher Sower, op. cit., p. 210.

The calculated χ^2 shows that the null hypothesis of no difference is not rejected. It means that from 1955 to 1965 there was no significant change for Sinhalese cultivators in terms of paddy productivity.

One possible explanation is that the new method of cultivation (Japanese method) was not adopted by the Ceylon cultivators in general even though it was highly recommended by the government.[1] It is also noted that the farmers didn't use enough fertilizer for their paddy land.[2]

Generally speaking before 1965 attempts of the Ceylon government toward improvement were concentrated on improving the industrial and urban areas with the agricultural and rural areas almost neglected until 1965. By that time the government of Prime Minister Dudley Senanayake put greater emphasis on agriculture by propagandizing a "Green Revolution" all over the country. He ordered the Agricultural Development Proposals published in which there are proposals aiming

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[1]"The new transplanting process is fairly difficult, highly scientific and more expensive kind of practice; there were a few persons in almost every village studied who were trying new ideas," Christopher Sower, op. cit., p. 134.

[2]Report of a Rural Development Evaluation Mission in Ceylon, 1962, p. 86.

at increasing the paddy production by a heavier and more balanced application of fertilizer.[1] In addition, a program of investment in fertilizer stores, seed paddy, tractors, machinery for paddy cultivation, a plan of irrigation facilities and a provision of Agricultural Credit and Crop insurance scheme were implemented in order to raise the paddy yield.[2]

Finally the paddy yield didn't increase much from 1955 to 1965 is also due to the fact that:

1. The land cultivated was held in very small holdings (about 64% of the holdings were below one acre each, about 31% a half acre each and about 85% below two acres each).

2. The land was not owned by cultivators (about 60% of this land was owner cultivated, 25% was cultivated by tenants).

3. And cultivators consequently were generally indebted. They couldn't invest much capital other than their labor in production; therefore low production.[3]

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[1] Agricultural Development Proposals 1966-1970, prepared by the Department of Agriculture and Food, Government Press, Colombo, Ceylon, 1966, p. 6.

[2] Ibid., pp. 121 and 97.

[3] Ibid., p. 111.

Table 10.4 Tamil cultivator's statement of average number of bushels produced per acre on his paddy land in 1955 and 1965

	Tamil 1955	Tamil 1965	Total
10 or under	189 (161.2)	39 (66.8)	228
11 - 20	29 (31.1)	15 (12.9)	44
21 - 35	2 (17.6)	23 (7.3)	25
36 - 50	2 (6.3)	7 (2.6)	9
over 51	0 (5.6)	8 (2.3)	8
Total	222	92	314

$\chi^2 = 93.8$

χ^2 required at .01 level = 13.27.

The calculated χ^2 indicates that the changes from 1955 to 1965 was significant at .01 level. It is observed that in 1965 there was an increase in paddy production for the Tamil farmers. This seemed inconsistent since the data in Table 11.4 shows that in 1965 the Tamil cultivators didn't make any significant improvement in their paddy yield during the previous 12 months as evidenced by the non-significant χ^2 of .51.

It is also evident in the explanations of Table 10.3 that the Ceylon villagers didn't make any significant increase of paddy productivity per acre from 1955 to 1965 as shown by the χ^2 of 2.91.

The seeming error found in the data presented in Table 10.4 may be explained by the inaccuracy of information.

Tables 11.1 through 11.4 present data on the total bushels of paddy the Ceylon cultivators received from their land during the previous 12 months in 1955 and 1965.

These tables (11.1 through 11.4) are consistent with Tables 10.1 through 10.4 which indicate the number of bushels yielded per acre. The Tamil cultivators who appeared to have their paddy land yield less bushels per acre than the Sinhalese did also seemed to receive less bushels in the previous 12 months.

In 1955 there were 35 Sinhalese cultivators with a yield of "10 or under" bushels as compared to 83 in "50 or over" bushels while there were 18 Tamil cultivators in "10 or under" bushels as compared to only three in the "50 or over" bushels category.

The difference was significant with a χ^2 of 26.25.

Table 11.1 Cultivator's statement of the total bushels of paddy received from land during the previous 12 months in Sinhalese and Tamil villages in 1955 and 1965

Total bushels received	Sinhalese 1955	Tamil 1955	Total
under 10	35 (43.3)	18 (9.7)	53
11 - 20	22 (26.9)	11 (6.1)	33
21 - 50	29 (28.6)	6 (6.4)	35
51 and over	83 (70.2)	3 (15.8)	86
Total	169	38	207

$\chi^2 = 26.25$

χ^2 required at .01 level = 11.34.

Table 11.2 is quite similar to Table 11.1. The null hypothesis of no difference is rejected by the significant χ^2 at the .01 level. It is observed that in 1965 the percentage of the Tamil cultivators decreased as the number of bushels increased. In 1965 there were 18 Tamil cultivators in "under 10 bushels" cell as compared to five in "over 51 bushels" cell while there were 27 Sinhalese cultivators in "under 10 bushels" cell as compared to 96 in "over 51 bushels" cell during the previous 12 months.

Table 11.2 Cultivator's statement of the total bushels of paddy received from land during the previous 12 months in Sinhalese and Tamil villages in 1965

Total bushels received	Sinhalese 1965	Tamil 1965	Total
10 or under	27	18	45
11 - 20	28	10	38
21 - 50	17	6	23
51 and over	96	5	101
Total	168	39	207

$\chi^2 = 27.94$

χ^2 required at .01 level = 11.34.

Table 11.3 shows that from 1955 to 1965 the Sinhalese cultivators' paddy yield stayed the same as evidenced by the non-significant χ^2 of 5.91. This table is inconsistent with Table 10.3 which indicates that from 1955 to 1965 the Sinhalese cultivators' paddy yield per acre was constant.

Table 11.3 Sinhalese cultivator's statement of the total bushels of paddy received from land during the previous 12 months in 1955 and 1965

Total bushels received	Sinhalese 1955	Sinhalese 1965	Total
10 or under	35 (31.0)	27 (30.9)	62
11 - 20	22 (25.1)	28 (24.9)	50
21 - 50	29 (23.0)	17 (23.0)	46
51 and over	83 (89.7)	96 (89.3)	179
Total	169	168	337

$\chi^2 = 5.91$

χ^2 required at .01 level = 11.34.

Table 11.4 also shows a non-significant change from 1955 to 1965 in the Tamil villages as evidenced by the non-significant χ^2 of .51. The possible explanations of Tables 11.1 through 11.4 were the same as given for Tables 10.1 through 10.4.

Table 11.4 Tamil cultivator's statement of the total bushels of paddy received during the previous 12 months in 1955 and 1965

Total bushels received	Tamil 1955	Tamil 1965	Total
10 or under	18 (17.7)	18 (18.2)	36
11 - 20	11 (10.3)	10 (10.7)	21
21 - 50	6 (5.9)	6 (6.1)	12
51 and over	3 (3.9)	5 (4.1)	8
Total	38	39	77

$\chi^2 = .51$

χ^2 required at .01 level = 11.34.

Chapter 5

SUMMARY--CONCLUSION--RECOMMENDATION

SUMMARY

The Problem

The purpose of this study was to investigate the changes in four Sinhalese villages--Illukwewa, Higoda, Ellagala and Hinguraka--and two Tamil villages--Idaikurichy and Varany North--from 1955 to 1965.

These changes were also used to compare the two types of ethnic villages: Sinhalese and Tamil in terms of adopting the recommended practices.

The Hypothesis

It was hypothesized that there were changes in both Sinhalese and Tamil villages due to the adoption of recommended agriculture, public health, and medical care procedures.

It was further hypothesized that the differences between the Sinhalese and the Tamil villages--that is to say their history, geography, tradition, culture

and socio-economics--influenced the recommended adoptions mentioned above.

Method of Collecting Data

This present research was based on the data collected by Sower and Welikala in their studies of Ceylon in 1955 and 1965 in which the samples were six selected villages of Ceylon. Four of them were Sinhalese speaking villages including Hinguraka, Higoda, Ellagala and Illukwewa. The other two were the Tamil speaking villages of Idaikurichy and Varany North. They were purposely chosen to represent the typical characteristics of each region.

The family units of each village were investigated. These units were randomly selected from each village. There were also cases where all the village units were selected for investigation.

Interviews were used to collect the information.

There were a total of 479 and 377 interview schedules available from the studies of 1955 and 1965 respectively.

Method of Analyzing the Data

Based on the availability of identical data from both studies--Ceylon in 1955 and 1965--the author used

the Chi-square statistic to test the null hypotheses of no differences between the two types of ethnic villages and no differences between the two time periods in relation to the recommended adoptions of agriculture, public health and medical practices.

Contingency tables were set up by calculating the number of villagers falling in each category. The total number of four Sinhalese villagers who belonged to the same category were grouped together. The same thing was done with the two Tamil villages. As a result, the six selected villages were compared not as six separated villages but as two types of ethnic villages--one Sinhalese and one Tamil.

CONCLUSION

Summary of Statistically Significant Observations

The following differences between the two types of ethnic villages were statistically significant:

More Sinhalese villagers participated in RDS in 1965.

More Sinhalese houses were built with mud-thatch or masonry while more Tamil's were built with ola-thatch. Consequently Tamil shelters had less satisfactory ventilation.

There were more protected wells in the Tamil villages.

The Sinhalese seemed to boil their drinking water more often than the Tamils did.

There were more confinements at home in the Tamil villages. Consequently more Tamil confinements were attended by the untrained village nurses while more Sinhalese's were attended by government mid-wives and government medical officers.

There were more Sinhalese cultivators who had some knowledge of the Japanese method of cultivation. In contrast there were more Tamils who had no knowledge of that method.

Sinhalese paddy land yielded more bushels per acre than that of the Tamils. Consequently the Sinhalese cultivators received more bushels in the previous 12 months in both years (1955 and 1965).

The following statistically significant changes from 1955 to 1965 were observed:

There was a decrease in RDS membership among the Tamil villagers.

In 1965 more Tamil houses were built with mud-thatch and less with ola-thatch.

In 1965 the satisfactory adequacy of ventilation in the Tamil as well as in the Sinhalese shelters decreased.

In 1965 there were more protected wells in the Tamil villages; as a result, Tamil families boiled their drinking water less often in 1965 than in 1955.

In 1965 more Sinhalese confinements were held at maternity houses. Consequently their percentage of confinements attended by government mid-wives and government medical officers increased. In contrast, that of the Tamils decreased.

In 1965 there was an increase in the Tamil paddy land yield per acre.

In 1965 the percentage of the Sinhalese cultivators who had no knowledge of the Japanese method of cultivation increased.

Summary of Statistically Non-significant Observations

The following statistically non-significant differences between the two types of ethnic villages were observed:

The percentage of RDS membership in 1955.

The percentage of families who had and used sanitary latrines in both 1955 and 1965.

The following changes were not statistically significant from 1955 to 1965:

The percentage of the Sinhalese members of RDS.

The percentage of the Sinhalese houses built with mud-thatch and masonry.

The percentage of the Sinhalese families who had protected, partly protected and unprotected wells.

The percentage of the Sinhalese families who boiled their drinking water.

The percentage in both villages which had a sanitary latrine.

The percentage of the Tamil confinements held at home.

The Sinhalese paddy yield per acre.

The bushels of paddy received in previous 12 months in both Sinhalese and Tamil cultivators.

In summary, the findings of this study show a significant difference between the two types of ethnic villages in terms of recommended adoption of medical care, public health and agriculture practices.

The findings also show a significant change from 1955 to 1965 in the Tamil villages; however, this change

was a decrease in adopting such recommended practices while not much statistically significant change was observed in the Sinhalese villages after a period of 10 years.

RECOMMENDATIONS FOR FURTHER RESEARCH

Based on these findings, the author came to a conclusion that the RD program in Ceylon in general was not as successful as was expected. The observations in this study are concomitant with those reported in the Report of A Rural Development Evaluation Mission in Ceylon, 1962 which indicates that the RD program didn't achieve its objectives during the 1960's. The causes of such failure are manifold.

The RD program in Ceylon was not the responsibility of a single department but involved the activities of many departments. Due to the lack of coordination among the different departments, this program as a whole had a loose organization. As a result, the lack of a structure caused an inadequate orientation and training of the leaders and the field personnel expected to provide these effective services.

As far as the villagers were concerned, they showed little enthusiasm in contributing as volunteers to the public services. They also resisted any innovations especially those brought over from other countries.

This is a common problem faced not only by Ceylon but by many other countries in Southeast Asia which are trying to re-educate their village populations. This psychological problem has always been an obstacle to any adoption of recommended practices for improving the rural life.

The social and psychological factors affecting the villagers' beliefs and behaviors make the role of a "change agent" in those countries the most important one. Any new practices will not be adopted until their traditional beliefs and behaviors are changed and are ready for such innovations. However, this does not mean that all their own traditions should be changed. It is the change agent's duty and responsibility to distinguish which traditions should be preserved and which should be changed in order to make the lives of the people improved without losing the beautiful traits of that culture.

This is one of the problems faced by most of the Southeast Asian countries which deserves all possible further analysis and research.

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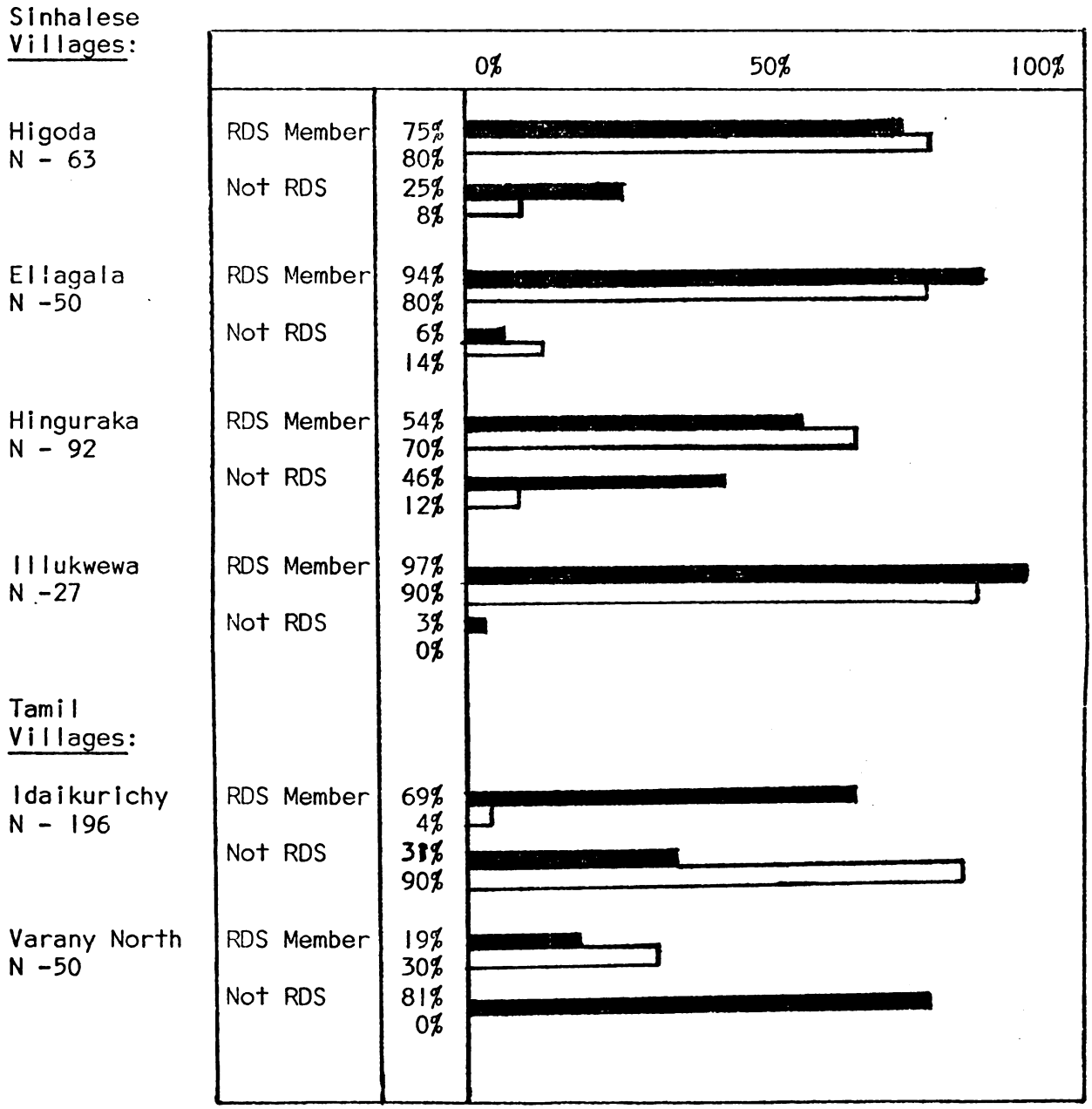
APPENDIX

(Eleven figures taken from Dr. Sower's original research of Ceylon in 1955 and 1965)

FIGURE I

NUMBER OF PERSONS INTERVIEWED IN EACH VILLAGE AND PERCENT WHICH ARE MEMBERS OR NON-MEMBERS OF A RURAL DEVELOPMENT SOCIETY, BY VILLAGES



Data obtained in 1955

Data obtained in 1965

(Applies to all following figures)

FIGURE 2

TYPE OF MATERIAL USED IN HOUSE CONSTRUCTION. By Villages.

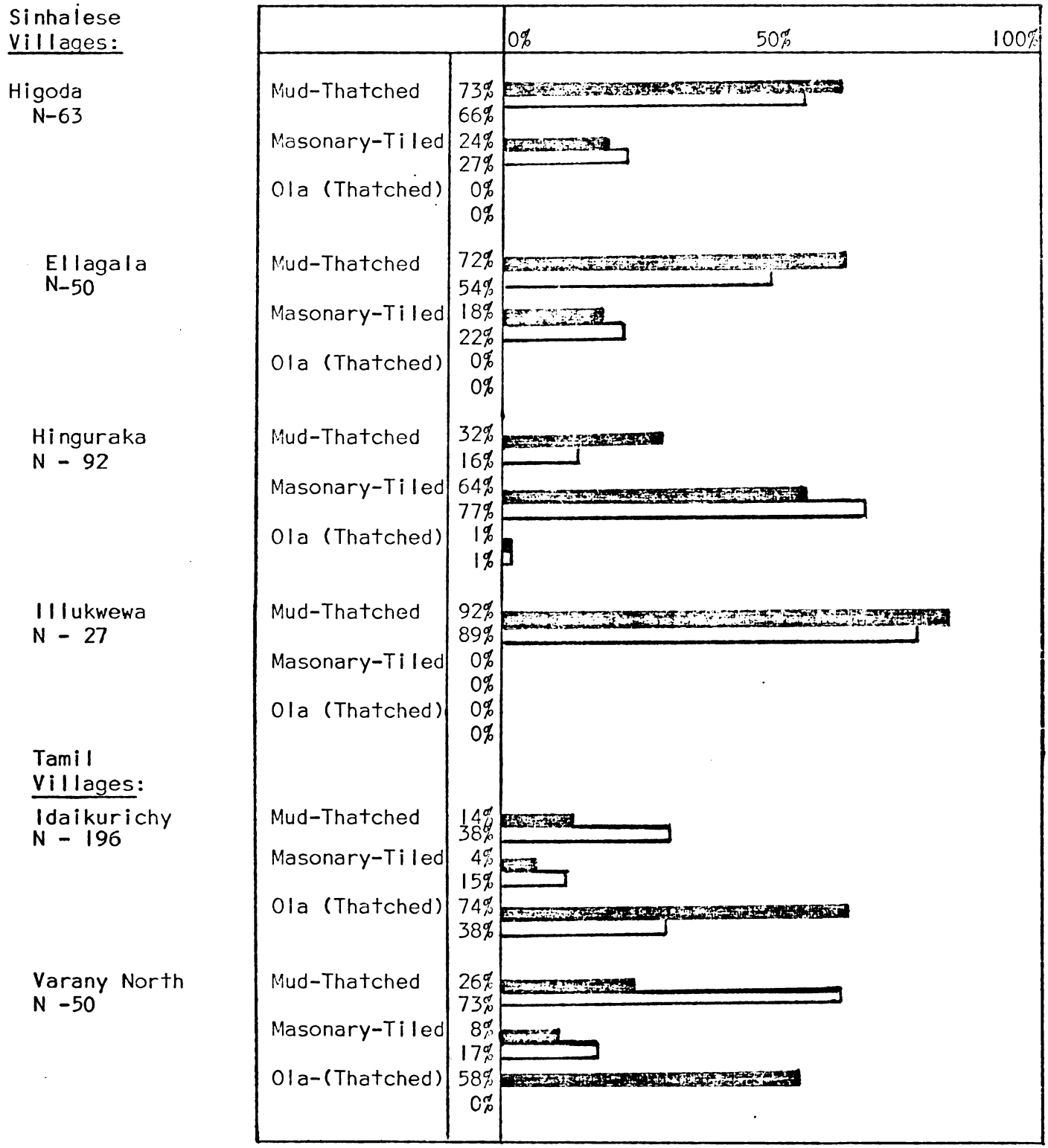


FIGURE 3

ADEQUACY OF VENTILATION OF HOUSES BY VILLAGES

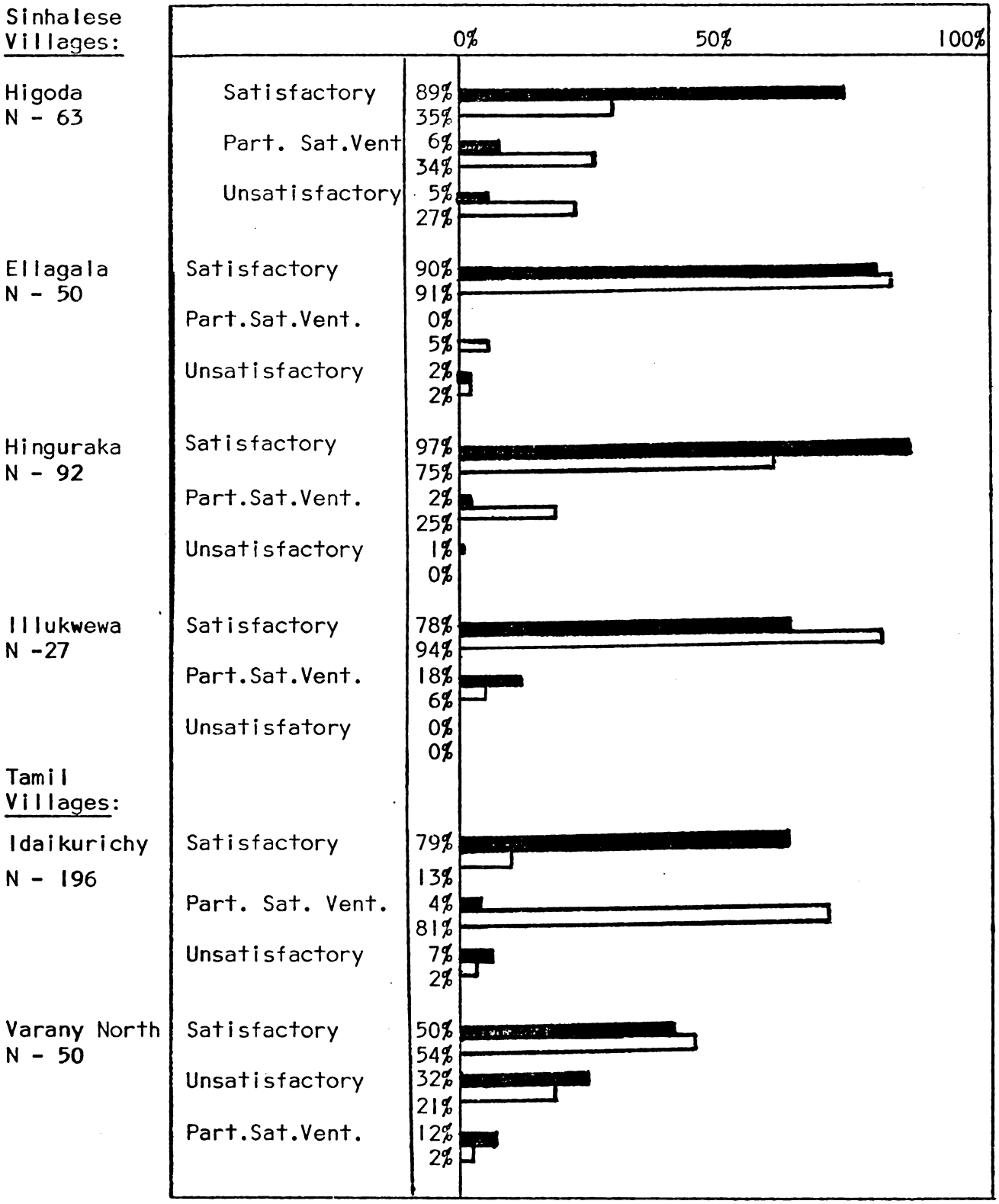


FIGURE 4

SOURCES OF DRINKING WATER, By Villages

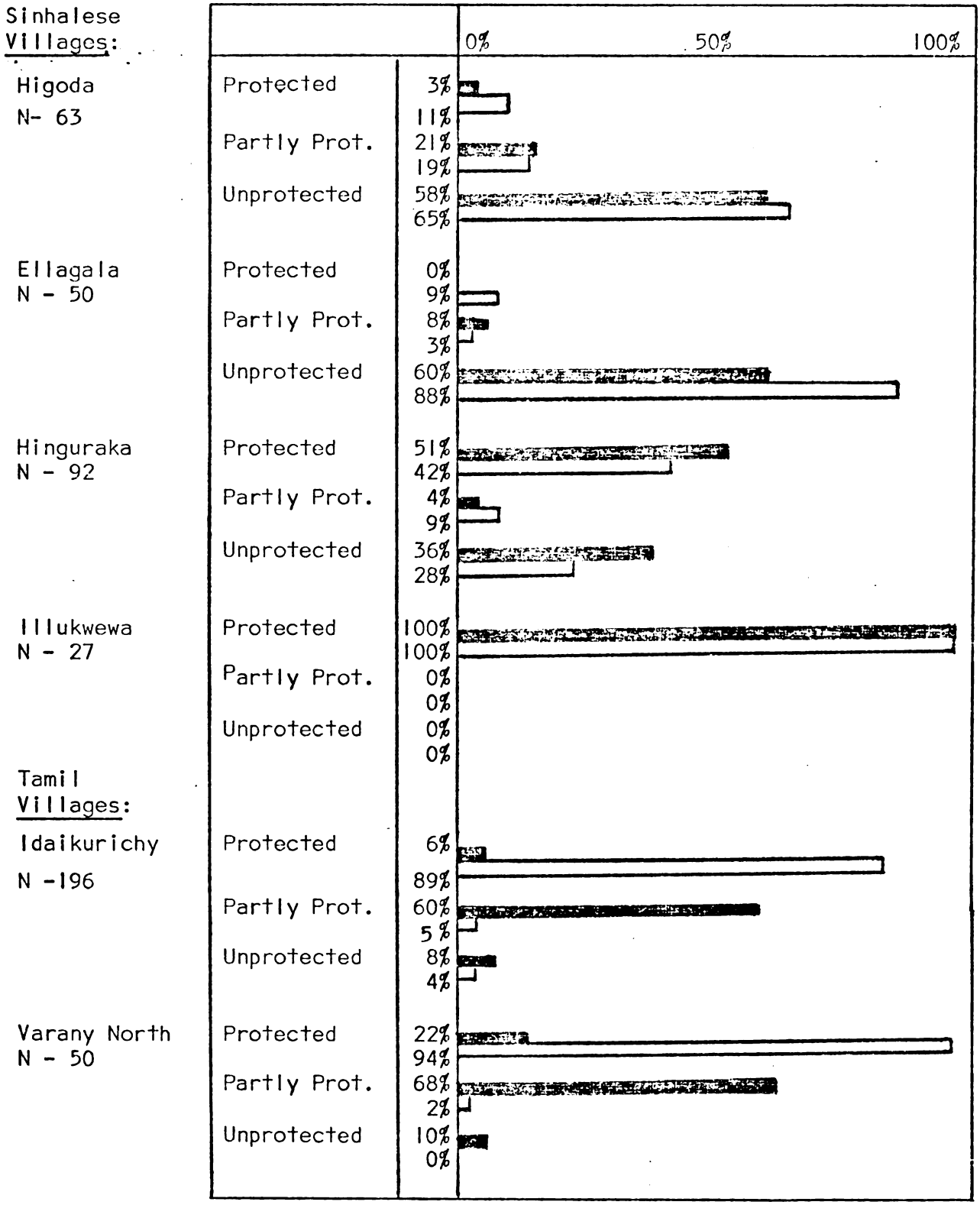


FIGURE 5

PERCENTAGE OF FAMILIES WHO BOIL THEIR DRINKING WATER,
By villages.

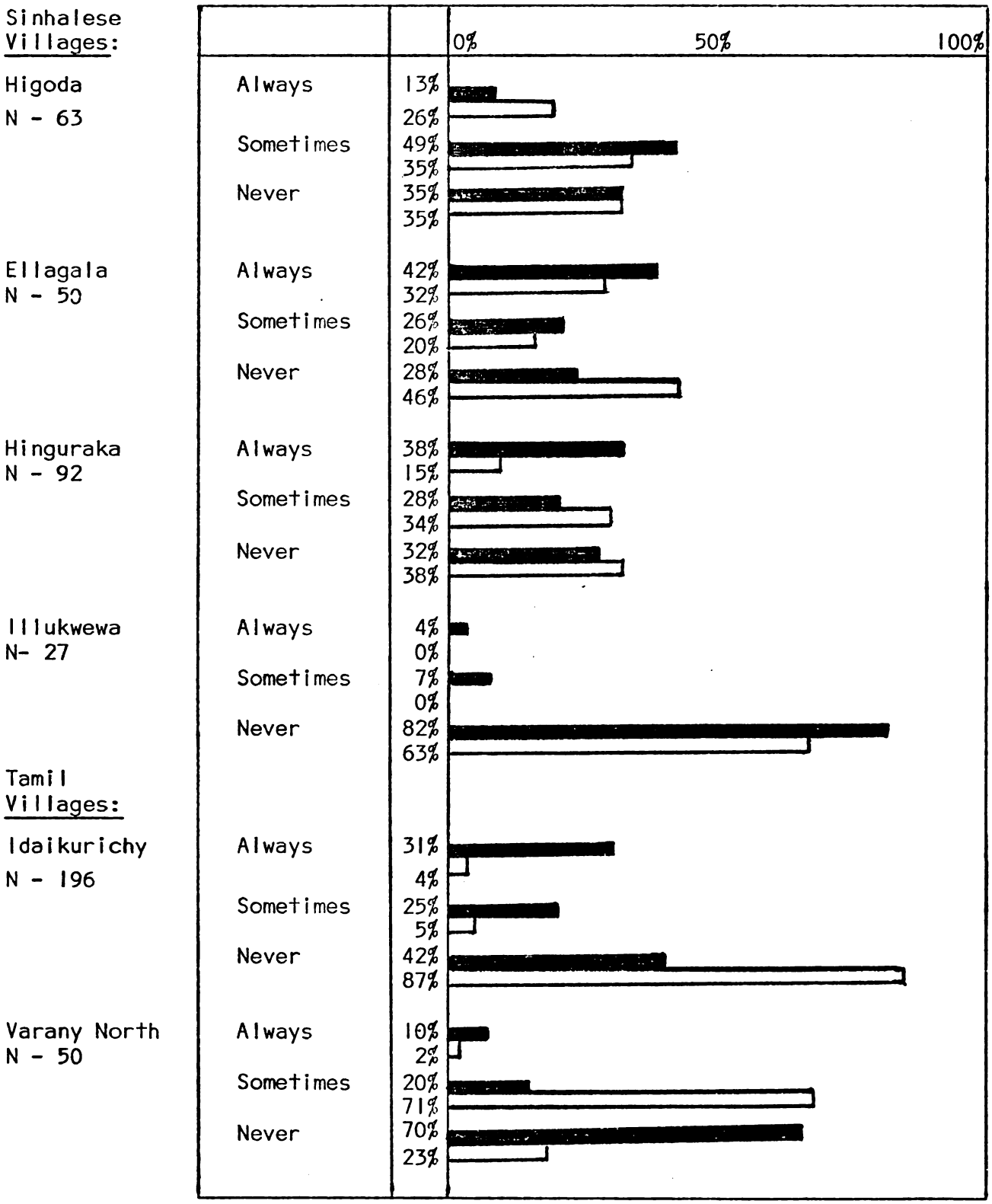


FIGURE 6

PERCETAGE OF FAMILIES WHICH HAVE A SANITARY LATRINE (either pit or water seal type) , AND PERCENTAGE OF FAMILIES WHICH STATE THAT THEY CUSTOMARILY USE A LATRINE. By Villages.

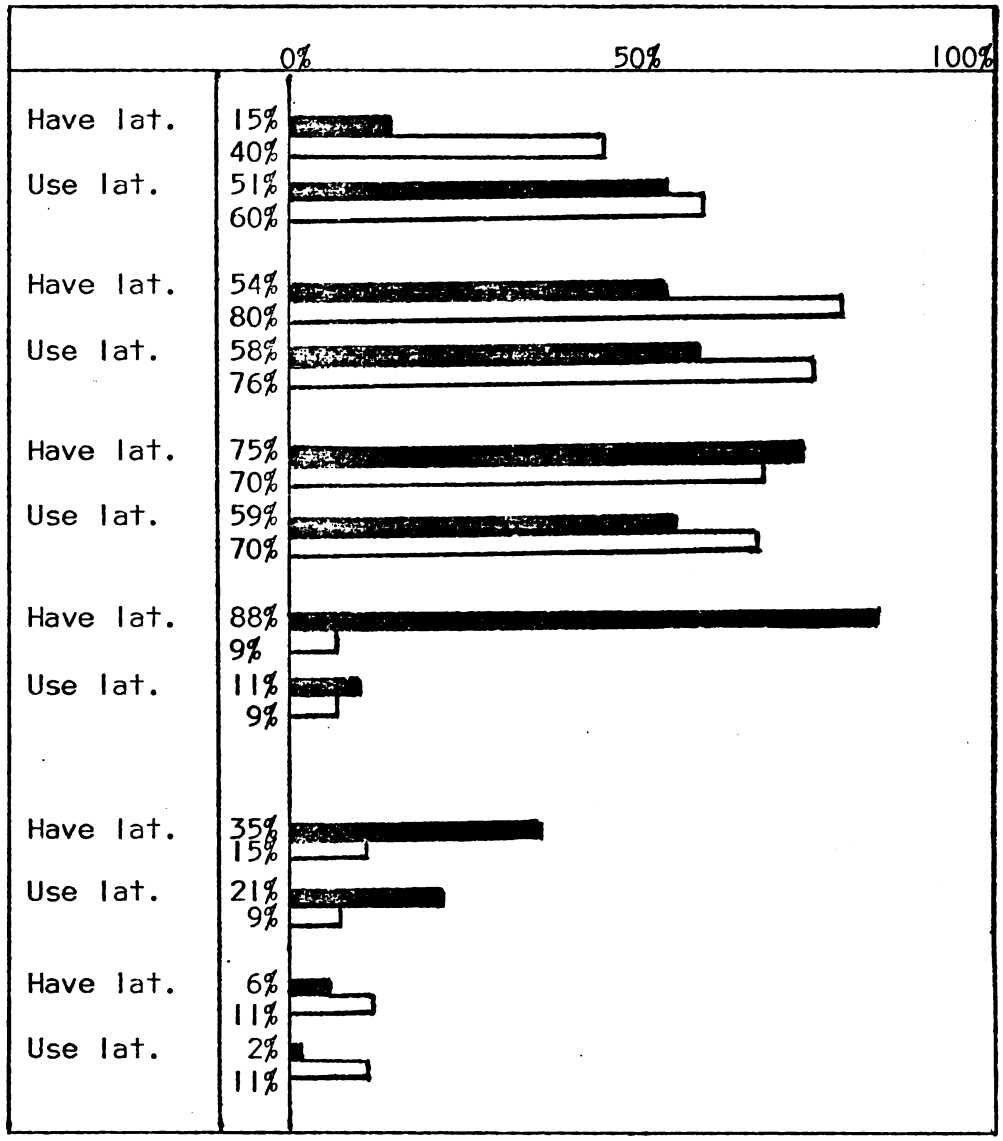


FIGURE 7

PERCENTAGE OF LAST CONFINEMENTS HELD AT HOME OR AT MATERNITY HOME, By Villages.

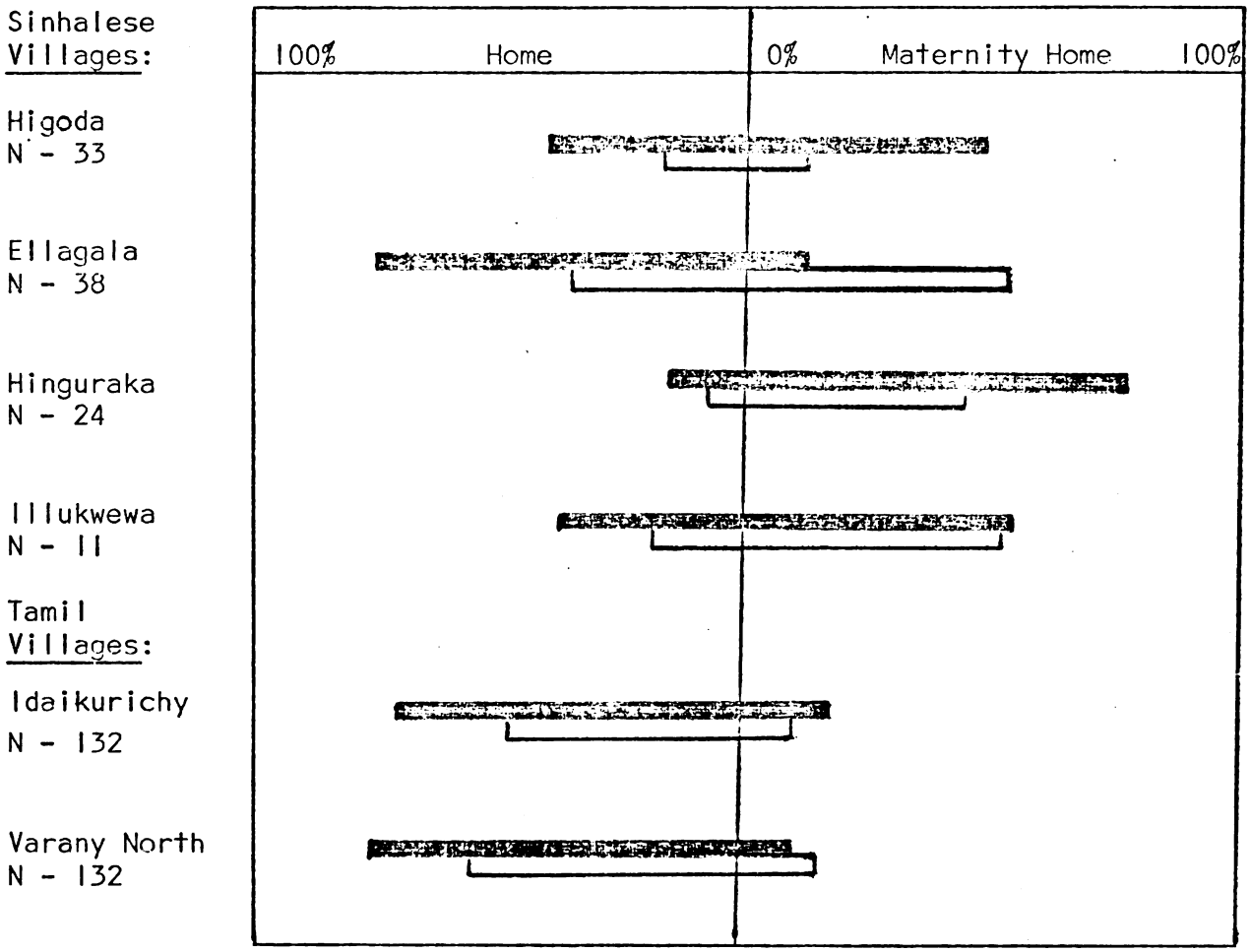


FIGURE 8

PERCENTAGE OF LAST CONFINEMENT ATTENDED BY EITHER GOVERNMENT MIDWIFE, VILLAGE UNTRAINED NURSE, OR A GOVERNMENT MEDICAL OFFICER, By Villages

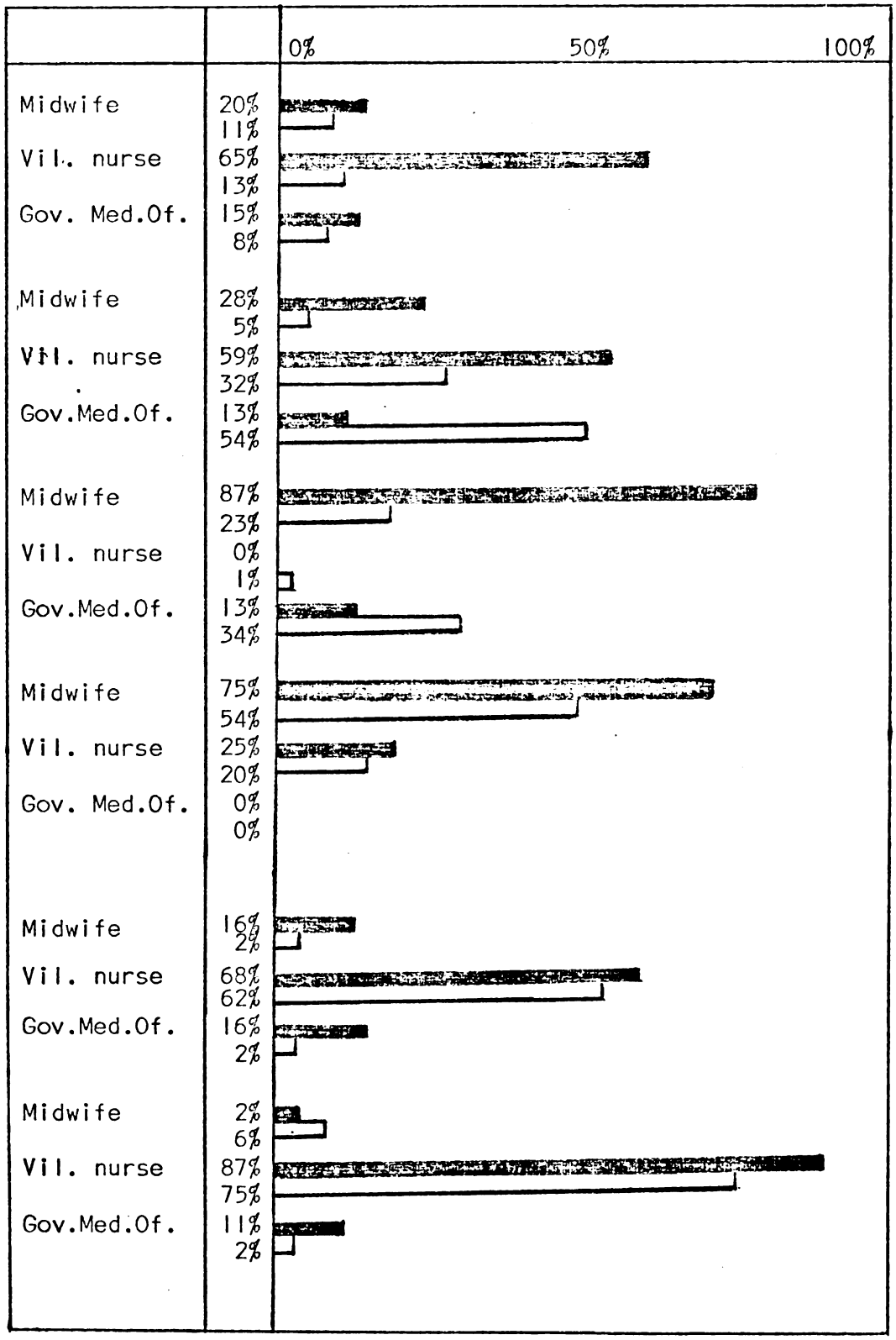


FIGURE 9

EXTENT TO WHICH PADDY CULTIVATORS HAVE KNOWLEDGE OF JAPANESE METHOD OF PADDY CULTIVATION, By Villages.

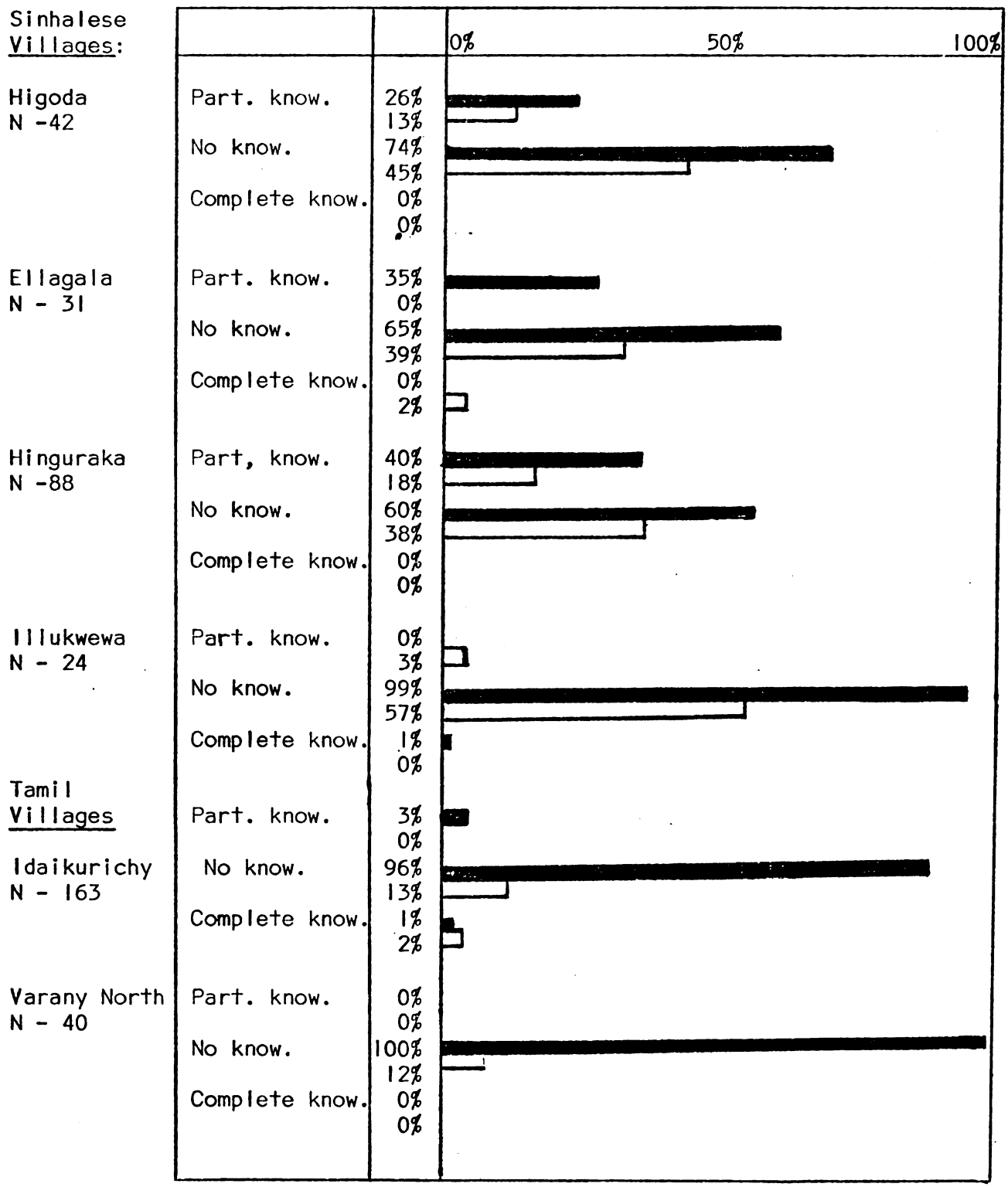


FIGURE 10

CULTIVATOR!s STATEMENT OF AVERAGE NUMBER OF BUSHELS PRODUCED PER ACRE ON HIS RAINFED PADDY LAND
Percentage of Cultivators in different Groupings for Villages which have Rain Fed Paddy Land

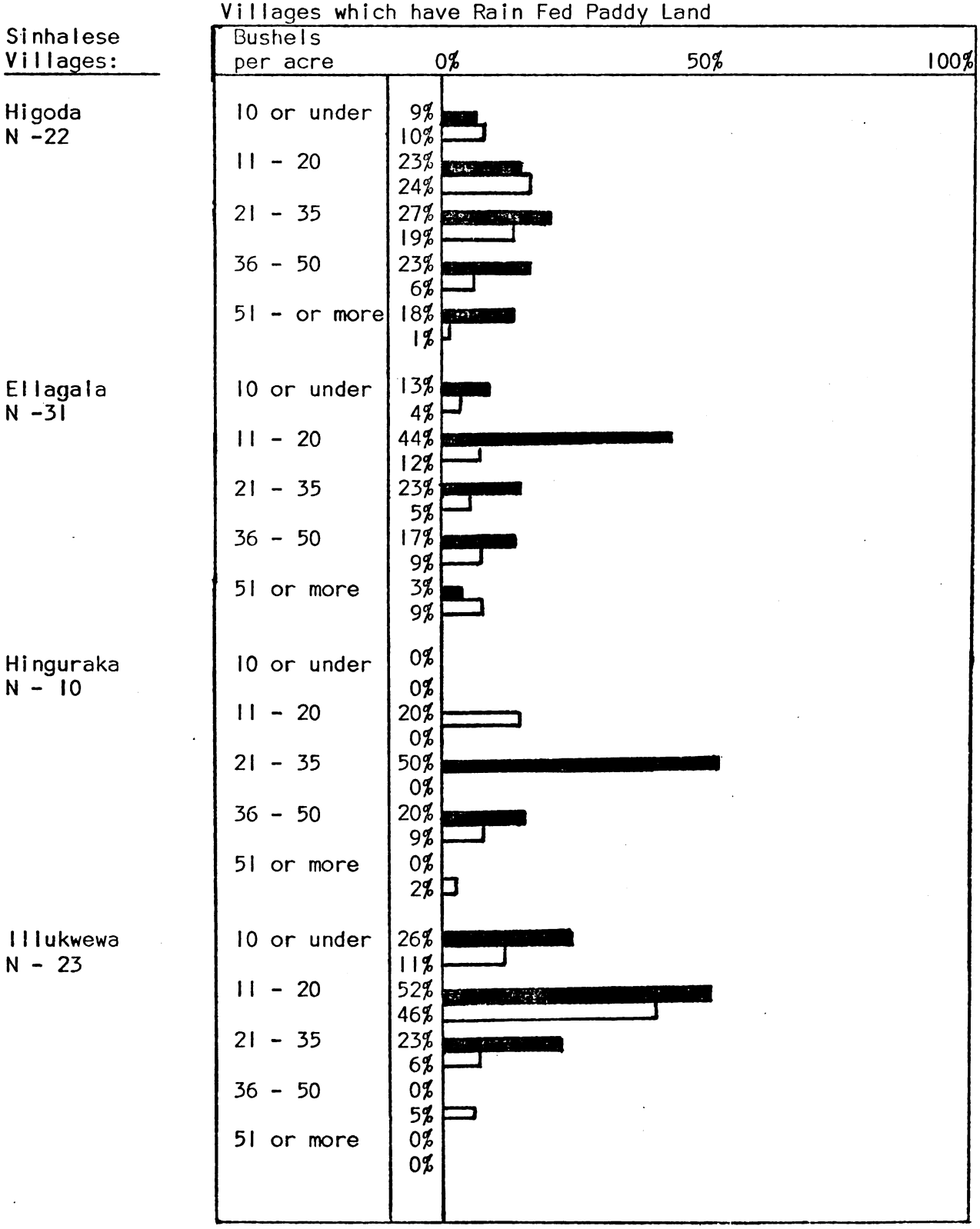


FIGURE 10 (cont'd)

Tamil Villages:

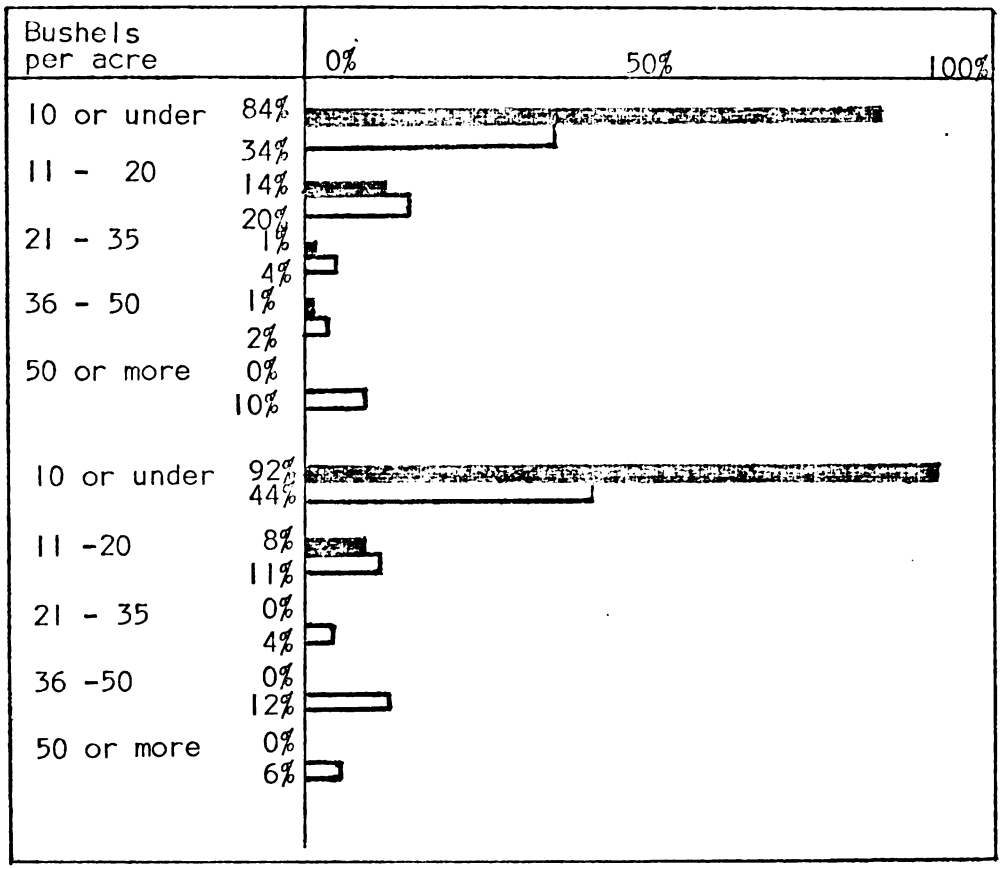
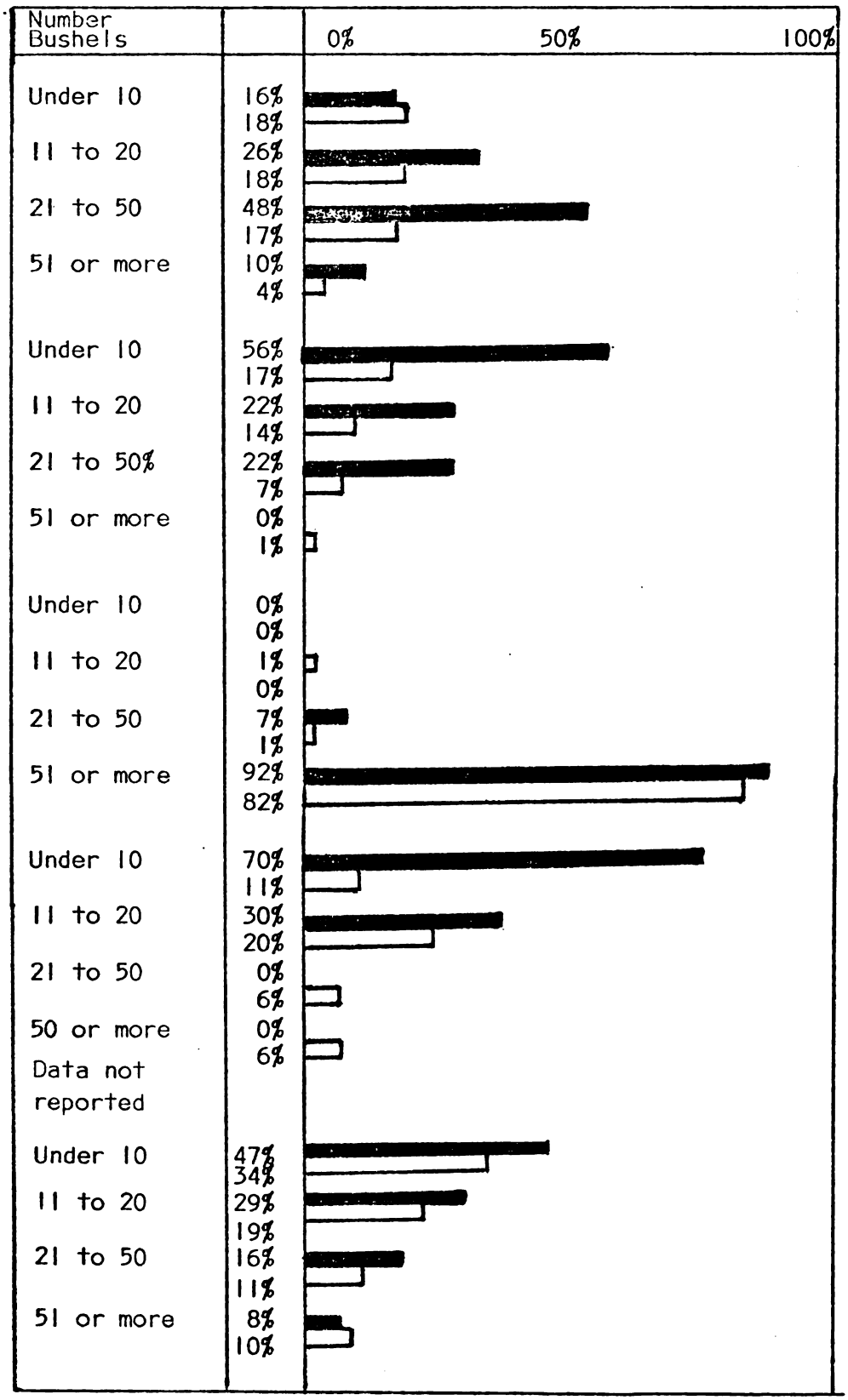


FIGURE 11

CULTIVATOR'S STATEMENT OF THE TOTAL BUSHELS OF PADDY RECEIVED FROM LAND DURING THE PREVIOUS TWELVE MONTHS: Percentage of cultivators in different bushel groupings; by villages which report Paddy Production.



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