HEALTH CONDITION OF UPLAND FARMERS: A STUDY ON THE EFFECTS OF THE UPLAND DEVELOPMENT PROGRAM IN LAKE BALINSASAYAO

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Introduction

One of the important concerns of economic development in a community is health improvement of its inhabitants. If one assumes that health is dependent on the availability of food and other basic resources, an increase in the quantity and quality of these goods is, therefore, imperative.

The Silliman University Research Action Development Program in the Uplands (SURADPU) particularly in Lake Balinsasayao, started around three years ago (1984). It is an integrated approach aimed at conserving the remaining forest by keeping the cleared farms stable. This aim is mainly carried out by introducing soil conservation techniques appropriate for the highlands. The embodying philosophy is this: Once the farms are stable, production will improve. Farmers will no longer find it necessary to expand forest clearings to augment production. In this way, forest clearings can be considered.

During the last three years of the program, the Lake Balinsasayao farmers have been exposed to intensive training on appropriate farming techniques which they implement on their farms. More than 20 farmers adopted the techniques. Their activities were monitored during the last two years to assess their farm production changes and their health condition. The assumption is that the farmers' present health condition is partly a reflection of the effects of their present food condition brought about by the adoption of new farm development techniques.

Baseline Health Condition of the Farmers

In May 1982, seven communities around Lake Balinsasayao were surveyed. A major concern was the assessment of the communities' health condition. This took place around two years before the project started operating. The study collected data on

Table 1

Percentage of Various Age Groups Who Are 10 Years Old and Younger By Nutritional Levels Based On Body Weight

Age Groups	Normal (%)	First Degree Malnourished (%)	Second Degree Malnourished (%)	Third Degree Malnourished (%)	Total (%)
Below 2 years old	54	31	8	7	100.00 (13)
3-4 years old	20	47	33	0	100.00 (15)
5-6 years old	0	75	25	0	100.00 (8)
7-8 years old	*	*	*	*	*
9-10 years old	*	*	*	*	*

* No data

Source: Fontelo 1985:87

anthropomorphic measurements as indicators of health conditions of preschool children (aged 0-6 years old). These measurements include weight, height and arm circumference (Fontelo 1985).

On the basis of weight, the study (see Table 1) showed that the worst health condition was found among children aging 3-6 years old. While it is true that third degree malnutrition was found among children whose ages are two years old and below, its preparation (only 7% for third degree) was negligible. More than 50% were on the normal range. A very low percentage was registered as normal for those aging 3-6 years old.

In terms of height, those children aging two years old and below consistently demonstrated better condition compared to the older ones. More than 60% of those children aging two years and below were under normal condition of height (91-100% of ideal height). Nobody was considered as belonging to the third degree level (61-70% of ideal height). Among children aging 3-4 years old, 3% were considered third degree malnourished (see Table 2).

For ideal area circumference, however, children aging two years and below no longer performed as well as in the other indicators (ideal height and weight). The older age groups were slightly better off than the younger age category (see Table 3). This difference could be due to error in measurement especially for arm circumference, which is highly sensitive to inaccuracy (measurement slippage) compared to bodily weight and height.

In 1983, another study was conducted (Cadeliña 1984). This time the study did not do any anthropomorphic measurement, but concentrated on collecting information about incidence of illness. Fifteen percent of all the respondents contacted were sick at the time of the interview. They reported to be afflicted with viral infection (such as flu) and respiratory trouble.

Another question was asked on the incidence of illness during the last 12 months before the interview contact was made. On the basis of recall, 31% of the respondents claimed to have been sick, on the average, six times during the last 12 months.

Table 2

Percentage of Various Age Groups Who Are 10 Years Old And Younger By Nutritional Levels Based On Desirable Height (1982)

Age	91-100% of Ideal Height (%)	81-90% of Ideal Height (%)	71-80% of Ideal Height (%)	61-70% of Ideal Height (%)	Total (%)
Below 2 years old	62	23	15	0	100.00 (13)
3-4 years old	40	40	7	13	100.00 (15)
5-6 years old	38	62	0	0	100.00 (8)
7-8 years old	*	*	*	*	*
9-10 years old	*	*	*	*	*

* No data

Source: Fontelo 1985:88

Table 3

Percentage of Various Age Groups Who Are 10 Years Old And Younger By Nutritional Levels Based On Ideal Arm Circumference (1982)

	91-100% of Ideal Arm Circumference (%)	81-90% of Ideal Arm Circumference (%)	71-80% of Ideal Arm Circumference (%)	61-70% of Ideal Arm Circumference (%)	Total (%)
Below 2 years old	54	38	0	8	100.00 (13)
3-4 years old	60	40	0	0	100.00 (15)
5-6 years old	50	50	0	0	100.00 (8)
7-8 years old	*	*	*	*	*
9-10 years old	*	*	*	*	*

* No data

Source: Fontelo 1985:89

Each length of illness or sickness usually lasted for three days. This suggests that on the average, the morbidity rate in the area forced the ill farmers to stop from working around 18 days per year.

When the project started, another study which still included health condition was conducted (Harvey n. d.). This time, the data did not show marked improvement on the condition of the preschoolers. On the basis of weight, only 7% was reported normal; 51% was reported to be first degree malnourished; 35% second degree and 7% third degree. The information was, however, not disaggregated for the younger age groups.

Unlike the first study, the third study did not show consistency of health condition of the preschoolers when other indicators were used. For instance, when ideal height was used 39% was reported to be normal and the rest were first degree malnourished. When arm circumstance was used, 15% was reported normal First degree malnourished was on the magnitude of 66%, 15%, second degree and 4% for the third degree. On the whole, the same study also reported that around 12% among the the preschoolers showed physical manifestations of anemia.

Assuming that health education can improve health condition of the population, the second study also attempted to determine the proportion of households in the community having received basic health education. The data revealed that around 17% only received basic information and the rest did not.

Present Health Condition

From March 1986 to the present, a monthly monitoring of the health condition of our farmer cooperators of SURADPU in Lake Balinsasayao has been done. This includes documenting the incidence of illness among children and adults and the changes of the anthropomorphic measurements of children up to age 10. These measurements include weight, height and arm circumference.

For this paper, the data analyzed include only those collected from March 1986 to February 1987.

Morbidiy Pattern

The study in 1983, which was supposed to show the morbidity pattern of the community was refined by our ongoing one-year old health monitoring in the area. In the 1983 study, the respondents were not disaggregated according to age and sex. They were lumped into one category only. Most of the information sought were on the number and types of illness experienced during the 12 month period. At the time of the interview contact, 15% of the respondent population were reported to be sick. For the period of 12 months before the interview contact, 31% reported to have been sick.

The data on our present study allow us to see trends of morbidity pattern of various age and sex groups during a period of 12 months. Figure 1 shows that for the age group, 10 years old and below, the peak of incidence of illness could be seen both sex groups, although the peak tends to be higher for the females than for the males.

For the older age groups, two age levels were compared, i.e. the 11-29 years old and 30 years old and above. Figure 2 shows the morbidity pattern of four groups of population (female aging 30+, aging 11-29, male aging 30+ and male aging 11-29) on a monthly basis for 12 months. Similar to our first observation, two peak periods of illness (see Figure 2) occur during the months of March and November. This suggests that illness is seasonal and probably coincides with weather and temperature changes. It should be noted that the onset of the southwest moonsoon in the area occurs during the month of March and the northeast monsoon, November.

In almost all age groups (see Figure 1 and 2), the females are more prone to illness. A higher incidence of illness in almost all months have been registered by the females for age groups 10 and younger and aged 30 and older.

Between age groups, the youngest and oldest categories tend to be more susceptible to illness compared to the middle age groups. This suggests the general condition that the youngest and

Figure 1

Frequency Trend of Male and Female Population Aged 10 Years Old and Younger Who Got 111 During a 12-Month Period of Monitoring

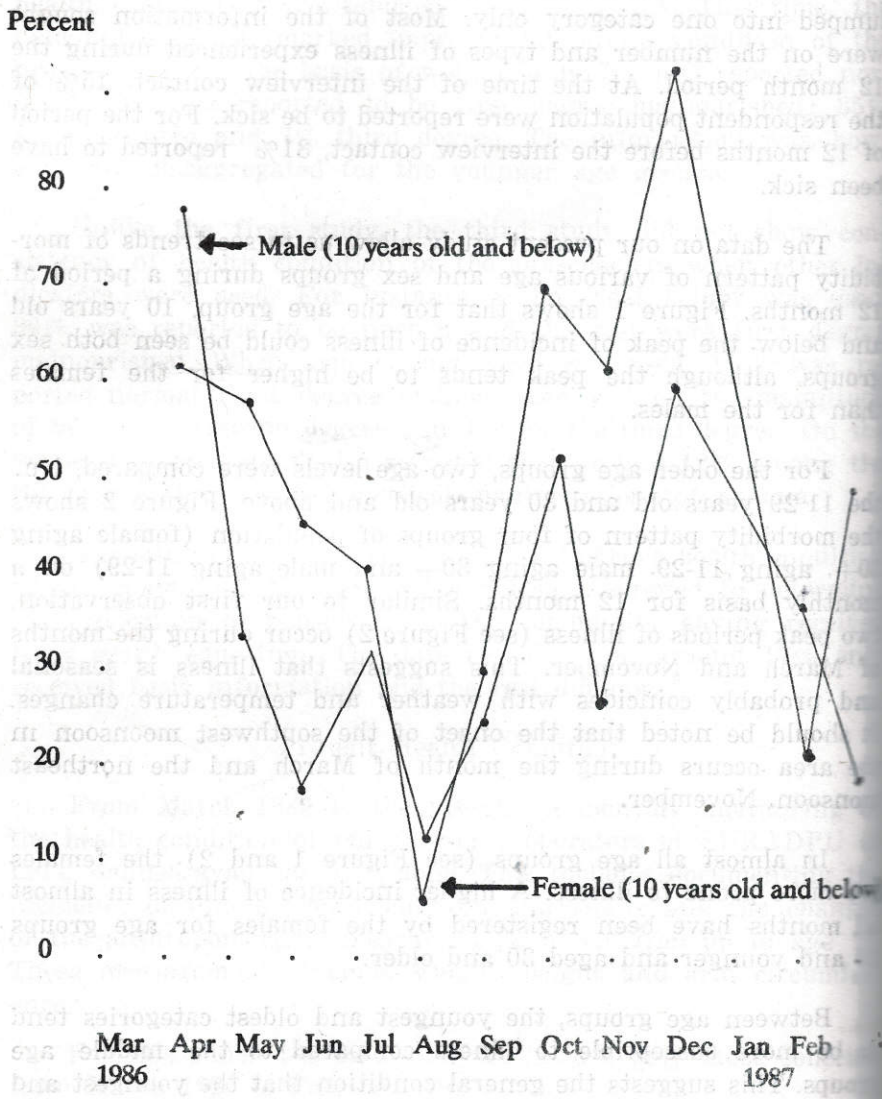

Figure 2

Frequency Trend of Male and Female Population Aged 10 Years Old and Younger Who Got 111 During a 12-Month Period of Monitoring

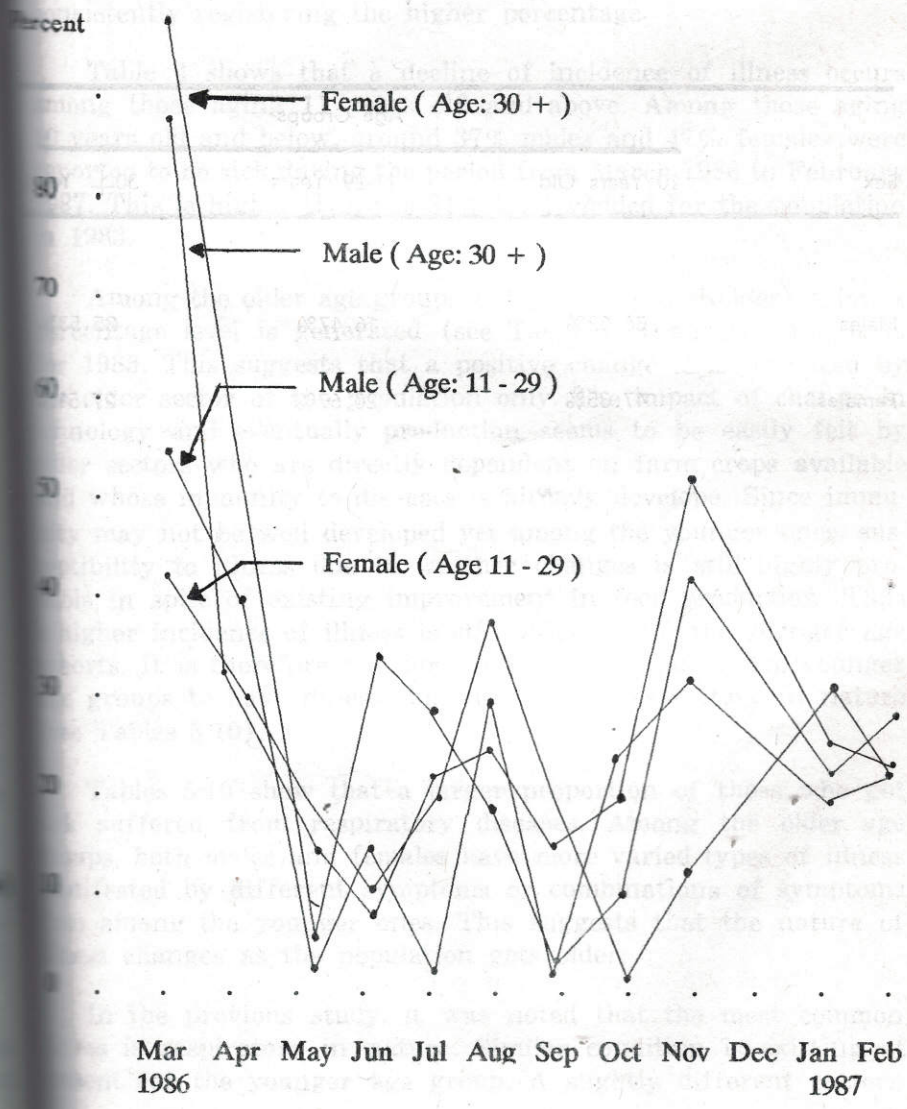

Table 4

Average Percentage of Individuals Under Various Age and Sex Groups Sick During 12-Month Period (March, 1986-February, 1987) Monitored In Lake Balinsasayao

Sex	Age Groups		
	10 Years Old	11-29 Years	30+ Years
Males	36.62%	16.47%	25.53%
Females	47.35%	20.67%	27.51%

Table 5

Kinds of Illness of 10 Years Old and Younger For a Period of 12 Months (Male)

Illness	MAR 1986	APR 1986	MAY 1986	JUN 1986	JUL 1986	AUG 1986	SEP 1986	OCT 1986	NOV 1986	DEC 1986	JAN 1987	FEB 1987
Abdominal problem	6%	10%	20%	0	0	0	0	0	0	-	0	0
Respiratory disease (cough with fever,etc.)	44%	50%	80%	60%	0	100%	57%	75%	71%	-	33%	100%
Others (tonsilitis, sore eyes, swelling of knees,etc.)	6%	30%	0	40%	100%	0	43%	0	0	-	0	0
Combination of the above	44%	10%	0	0	0	0	0	25%	29%	-	67%	0

- No data

Table 6

Kinds of Illness of 10 Years Old and Younger For a Period of 12 Months

Table 6

Kinds of Illness of 10 Years Old and Younger For a Period of 12 Months (Female)

Illness	MAR 1986	APR 1986	MAY 1986	JUN 1986	JUL 1986	AUG 1986	SEP 1986	OCT 1986	NOV 1986	DEC 1986	JAN 1987	FEB 1987
Abdominal problem	0	0	17%	0	0	20%	0	17%	0	-	0	0
Respiratory disease (cough with fever,etc.)	40%	65%	67%	100%	100%	80%	100%	83%	57%	-	100%	75%
Others (tonsilitis, sore eyes, swelling of knees,etc.)	20%	0	8%	0	0	0	0	0	29%	-	0	25%

- No data

Table 9

Kinds of Illness of Male Individuals Aged 30+ For a Period of 12 Months

Illness	MAR 1986	APR 1986	MAY 1986	JUN 1986	JUL 1986	AUG 1986	SEP 1986	OCT 1986	NOV 1986	DEC 1986	JAN 1987	FEB 1987
Abdominal Problem	10%	0	0	0	0	0	0	0	0	-	0	0
Respiratory diseases (cough with fever, etc.)	10%	57%	100%	100%	0	33%	0	100%	50%	-	100%	100%
Others(tonsilitis, sore eyes, swelling of knees,etc.)	30%	29%	0	0	100%	77%	100%	0	50%	-	0	0
Combination of the above	50%	14%	0	0	0	0	0	0	0	-	0	0

- No data

Table 10

Kinds of Illness of Female Individuals Aged 11-29 For a Period of 12 Months

- No data

Kinds of Illness of Female Individuals Aged 11-29 For a Period of 12 Months

Illness	MAR 1986	APR 1986	MAY 1986	JUN 1986	JUL 1986	AUG 1986	SEP 1986	OCT 1986	NOV 1986	DEC 1986	JAN 1987	FEB 1987
Abdominal problem	11%	13%	0	0	0	0	33%	0	33%	-	0	0
Respiratory diseases (cough with fever,etc)	22%	62%	75%	100%	0	80%	0	0	33%	-	50%	100%
Others (tonsilitis, sore eyes, swelling of knees,etc)	11%	13%	0	0	100%	20%	33%	0	0	-	50%	0
Combination of the above	56%	13%	25%	0	0	0	33%	0	33%	-	0	0

- No data

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of illness is occuring only for the older age category. Such difference is difficult to determine as "change" simply because the data from the two studies were not organized in a similar manner.

Table 11 reveals the number of days a person gets sick during the past 12 months. For all categories of respondents the average number is longer than that at the start of the project. The difference is almost twice as much. A longer length of illness is consistently demonstrated by the females from all age groups.

Table 11 suggests that while it is true that there is a decline in the proportion of those who got ill at present compared to that at the initial period of the project, the length of illness has not changed. In fact, the data reflect an increase in the number of days for the present. Such condition is difficult to explain.

Anthropometric Measurements

For the individuals aging 10 years old and below, three measures were taken. These were body weight, height and arm circumference.

Body Weight: On the whole, the males are found to be heavier than the females. However, the males do not consistently demonstrate weight superiority over the females for all age groups. For instance, the males aging 5-6 years old and 2 years old and below are relatively lighter than their female counterparts for these age categories. Nevertheless, the difference is slight (see Table 12). Assuming that body weight, among others, suggests certain amount of resistance to diseases, this might explain why we tend to find higher incidence of illness among the females than among the males.

Comparing the mean actual weight to the average minimum ideal weight of the various age groups, Table 13 shows that only the females belonging to the two-year-old and younger group have normal weights. Those who belong to the 3-4, 5-6 and 7-8 years old groups are below the average minimum ideal weikghts. These underweights fall under the first degree malnutrition.

Table 11

Average Number of Days A Person Got Sick During The Past 12 Months

Age and Sex Groups (1)	Average Monthly (Days) (2)	Annualizing Factor (3)	Estimated (Days) Average Annually (Col. 2 x Col. 3) (4)
Male (11 years old and older)	2.6	12	31
Female (11 Years old and older)	2.7	12	32
Male (0-10 years old)	2.9	12	35
Female (0-10 years old)	3.3	12	40

Table 12

Average Weight (Kilograms) of Male and Female Individuals By Age Groups (10 Years Old and Younger) During the Last 12 Months (March 1986-February 1987)

	Male		Female	
Age Groups	Mean Weight	C.V.*	Mean Weight	C.V.*
2 years old and below	9.03	.47	9.31	.42
3-4 years old	14.45	.38	11.84	.45
5-6 years old	15.67	.45	15.78	.43
7-8 years old	17.48	.43	17.36	.38
9-10 years old	20.57	.44	20.38	.43
N	—		—	

*Coefficient of Variation

Among the males, the 2 years old and below and the 3-4 years old have normal weights. Only the age groups 5-6 and 7-8 are underweight. Like their female counterpart, they are first degree malnourished.

This health condition is obviously better than what we found in the community around five years ago, i.e. before the establishment of the project. Table 1 showed 7% third degree malnourished and 8% second degree malnourished from children aging two years old and below. Among children belonging to 3-4 and 5-6 age groups, 33% and 25%, respectively were reported to be second degree malnourished. On the basis of weight, therefore, there is an improvement of the present health condition of the children compared to that found in the community before the program started.

Height: The height of the male and female individuals does not significantly differ. Tabe 14 shows that both males and females from the five different age groups have almost similar heights.

Let us now assess the health condition of the subject on the basis of height. This can be done by comparing the ideal height of the person given their actual weight and height. Since there is an ideal height associated with a particular weight, then we can assess health on the basis of actual height and weight.

Among the males, only the 7-8 and 9-10 age groups have normal heights. They slightly exceed the standard. All the other age groups (see Table 15) have height slightly shorter than the ideal. The difference suggests a first degree malnutrition.

Among the females, all age groups except one have normal heights. Females aging 2 years old and below have heights below the ideal, a condition suggesting only a first degree malnutrition.

On the basis of height, the present health condition of these age groups is better than that we found five years ago. Table 2 shows 15% belonging to the second degree malnutrition for ages two and below in 1982. Among children aging the 3-4 years old, 2% fall under the third degree malnourished level, while 7% fall under second degree malnourished level during that year.

Table 13

Health Condition of Male and Female Individuals Aged 10 Years Old and Below on the Basis of Body Weight During the Last 12 Months (March 1986-February 1987)

Age Groups	Mean Actual Weight		Average Minimum Ideal Weight*
	Male	Female	
2 years old and below	9.03	9.31	8.29
3-4 years old	14.45	11.84	13.29
5-6 years old	15.67	15.78	16.14
7-8 years old	17.48	17.36	17.65
9-10 years old	20.57	20.38	—
N=	—	—	

* Source: National Nutrition Council 1974:45-46.

\- No data

Table 14

Average Height (Inches) of Individuals Aged 10 Years Old and Below During the Last 12 Months (March 1986-February 1987)

	Male		Female	
Age Groups	Height (Inches)	C.V.*	Height (Inches)	C.V.*
1 years old and below	28.00	.45	28.08	.58
2-4 years old	37.07	.43	37.44	.63
5-6 years old	39.60	.43	39.00	.72
7-8 years old	41.56	.39	41.34	.45
9-10 years old	45.00	.59	44.46	.42

* Coefficient of variation

Table 15

Health Condition of Male Individuals During the Last 12 Months (March 1986-February 1987) On the Basis of Height

Age Groups	Actual		Ideal*
	Weight (Kilogram)	Height (Inches)	Height (Inches)
2 years old and below	9.03	28.00	28.08
3-4 years old	14.45	37.07	37.44
5-6 years old	15.67	39.60	39.00
7-8 years old	17.48	41.56	41.34
9-10 years old	20.57	45.00	44.46

*Source: National Nutrition Council 1974:44

Table 16

Health Condition of Female Individuals During the Last 12 Months (March 1986-February 1987) On the Basis of Height

Age Groups	Actual		Ideal*
	Weight (Kilogram)	Height (Inches)	Height (Inches)
2 years old and below	9.31	28.32	28.47
4 years old	11.84	35.74	32.76
6 years old	15.78	40.16	39.00
8 years old	17.36	41.53	41.34
10 years old	20.38	44.79	44.46

*Source: National Nutrition Council 1974:44

Arm Circumference: The males, generally tend to register a bigger arm circumference. However, the pattern seems to change at the later age. The females, 7-8 and 9-10 years old, register a slightly larger arm circumference than their male counterparts in those age groups.

On the basis of arm circumference, the National Nutrition Council (1974:47) sets a standard for determining health condition of children. Three categories were set — "satisfactory," "at risks" and "undernourished." Individuals with arm circumference of 13.5 centimeters and above are considered satisfactory and those "at risk" have 12.6 to 13.5 centimeters. Below 12.5 centimeters is considered "undernourished."

Table 17 shows that all sex and age groups fall above the "satisfactory" marker. This suggests that on the basis of the arm circumference, the present population is under satisfactory health condition. If we compare this with our data in 1982 (see Table 3), the present condition must have improved from that of the past. Table 3 shows around 8% of those children aging two years old and below are third degree malnourished and 38% first degree. Among the other age groups, the proportion of first degree malnourished ranges from 40% to 50%. In fact, in another study conducted in 1984 (Harvey, n. d.), on the basis of arm circumference, only 15% were reported as under normal health condition.

Health and Nutrition Education

Toward the end of 1985, a full time nutritionist was hired for the project. Her responsibility was to provide educational training for the mothers on household nutrition and sanitation. Weekly seminars were held for the mothers. On the basis of our record on participation, 100 percent of the mothers within our area of operation have participated in this training. During the later period, family planning officers from the government (Population Commission) were invited to give seminars on family planning in the community.

Table 17

Average Arm Circumference (Centimeters) of Individuals Aged 10 and Younger During the Last 12 Months (March 1986-February 1987)

Age Groups	Male		Female	
	Arm Circumference (Centimeters)	C.V.	Arm Circumference (Centimeters)	C.V.
years old and below	14.17	.78	13.96	.71
years old	15.51	.82	14.69	.70
years old	15.90	.51	15.59	.83
years old	16.40	.49	16.69	.59
years old	17.14	.67	17.57	.67

This component of the program has therefore provided local training for mothers on proper food preparation, illness prevention, sanitation and family planning. It is asumed that this training program must have equipped with the basic information on those areas.

From the study of Harvey in 1984, it was noted that only 17% of the households in the community received basic health education. Therefore, the population at present, must have enjoyed better access to health education compared to that period in 1984. The availability of better informed mothers on health at present must also have contributed to the improvement of the actual health condition of the population today.

Summary and Conclusion

The study started with the asumption that the present health condition of the farmers and their household members in Lake Balinsasayao is the result, among others, of the present upland development program implemented in the area. Since the program has been in operation on field for three years, it was assumed that change in production must have already been felt by the population.

The program started collecting baseline information on the community five years ago. One set of information collected was on health condition. In March 1986, a continuing monthly monitoring of information on health was implemented. On a monthly basis, information on incidence of illness and anthropometric measurements (weight, height and arm circumference) were monitored. This is a continuing activity up to the present.

Three indicators of change on health conditions were measured. These were morbidity patterns, anthropometric measurement and prevalence of basic knowledge on health education. Although some of the data from the two periods (past five years and the present) are not directly comparable, some conclusions can still be discerned through inferences.

On the basis of the three indicators measured, the present health condition of the Lake Balinsasayao population is better than that of five years ago. Although the length of illness at present tends to be longer than that of five years ago, the overall percentage of illness incidence is lower. It should be noted, however, that the females are more prone to illness than their male counterpart.

There is a consistent pattern revealed using the anthropometric measurements. If ever malnutrition exists, the three measurements consistently show only first degree malnutrition. This tends to occur more frequently among the females. This perhaps explains why a relatively higher morbidity rate is found among the females. Nonetheless, the overall health situation is found to be a lot better than that prevailing in 1982.

The establishment of the program has improved the level of awareness on the part of the local mothers concerning proper nutrition, prevention of illness, sanitation and family planning. One hundred percent of the project's clientele population has already been exposed to these issues through seminars. Obviously, this shows a superior advantage to that one five years ago where only 17% had been reported to have learned basic health information.

It seems that the synergistic effect of the two components of the SURADPU program must have worked for the health improvement of the farmers. The introduction of the appropriate farming and cropping system for the uplands must have improved farm production and consequently food intake. The training on proper nutrition, illness prevention and sanitation must have reduced the risks of illness among the farmers.

For practical considerations, it appears that the impact of development program on health condition is dependent on two things. First, it hinges on the proper utilization of resources so that the quantitative and qualitative aspects of production can be improved. It should be noted that the nutritional quality of the food products can be improved by diversification, one of the goals

of the program's cropping systems component. In fact in another study (Cadeliña 1985), it was found out that diversification of crops can improve the quantitative dimension of production.

Second, it is also anchored on adequate health and nutrition educational drive. Improvement of the cropping system is not adequate if we want to feel a stronger impact on health. A suitable training program on nutrition and illness prevention should be incorporated, a step further to reduce the risk of illness.

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