Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development
Vol. 17, Issue 1, 2017
PRINT ISSN 2284-7995, E-ISSN 2285-3952

LABOUR-TIME-USE PATTERNS AND MAJOR DISEASES AFFECTING FARM ACTIVITIES IN ABIA STATE, NIGERIA

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Abstract

This study examined the major diseases affecting agricultural production in Abia state in line with the various time allocation and labour-use patterns in the study area. The Body Mass Index (BMI) was used as a classification criterion to categorize farmers as healthy and non-healthy. 1080 farming households were selected from Abia state through a multi-stage sampling technique. The anthropometric result (using BMI) showed that only about 44% of the farmers were healthy. There was a marked difference for labour and time-use patterns (considering the energy demands of the various activities) for both healthy and non-healthy farmers. Healthy households utilized family labour as their main source of labour while hired labour was mainly used by non-healthy households. Arthritis, rheumatism, malaria/typhoid and asthma were the major diseases that affected the farmers during different cultural activities. These farm activities are usually energy-sapping and have the tendency to increase the likelihood event for farmers to take ill. The study recommends that effective extension services geared towards educating farmers on preventive measures to avoid undue exposure to harsh environmental conditions so as to improve agricultural productivity. The operation of action programs to combat these health challenges by all stakeholders as well as the availability of inputs at subsidized prices will provide a pathway for improved healthiness and welfare by reducing the financial burdens faced by these poor, sick households.

Key words**:** *diseases, labour-use, cultural activities, productivity, healthiness*

INTRODUCTION

There is a strong argument that agriculture continues to be one of the most important drivers of poverty reduction and the bedrock for economic growth, especially for the billions of people in developing countries [4]. This argument has gained momentum over the years owing to the fact that in agriculture-based countries, the sector generates, on average, 29% of the gross domestic product (GDP) and employs 65% of the labor force [14]. Farm households can use savings from sales of agricultural proceeds for improved access to health products and services. Similarly, agriculture provides food and nutrients for energy and maintenance of good health.

The role of agriculture in human livelihood also means that agricultural development has strong linkages with other fields of development practice and research, including health and nutrition [4]. These linkages are causal in nature and imply that there is a strong interdependence across them. In a nut shell, the success of agricultural livelihoods depends on the health of its workforce. At the same time, different agricultural production systems have different impacts on health, nutrition, and well-being of the people. Based on this premise, farm-related infections and diseases could pose serious challenges to farmers' health and can thus be isolated to be detrimental. By these interactions, it can be said that agriculture and health are closely related and their consequences will be useful in planning development programs in agriculture and health.

Agricultural productivity will continue to experience decline owing to illness and consequent loss of productive adults' knowledge, assets to cope with illness and human capital through death as a result of HIV/AIDS, malaria, tuberculosis and other diseases [14]. These health threatening diseases such as malaria fever, HIV/AIDS, farm injuries, cholera fever, schistosomiasis, diarrhoea, respiratory diseases and skin

disorders are on the alarming increase [6,7,5]. A closer look at existing literatures show alarming rate of productivity decline through labour losses during various farm activities giving rise to trade-offs between the cost of care-giving (for the sick) and labour productivity. For example, when a household member gets sick, arrangements are made to take care of the person and this may further aggravate the household labor situation. In Northern Zambia, AIDS-affected households, particularly those headed by women, reduced the total area under cultivation due to labor shortages [8]. A Tanzanian study by [11] reported that women spent 60% less time on farming activities taking care of their husbands suffering from AIDS. Available healthy time has often times been reduced due to incapacitations. In line with this, a study showed that Ethiopian women were found to spend about 100 hours a week which is equivalent to about 4 days nursing AIDS-affected household members, largely at the expense of their children and their farms [9]. Nigerian subsistence farmers spend as much as 13% of total household expenditure on treatment of malaria alone [2], thus lending credence to the fact that cost of combating diseases and health problems by farmers is quite enormous, considering the frequency and prevalence of diseases among Nigerian farmers. This study is carried out in an attempt to cross-examine the major diseases affecting farm activities and practices in Abia state, Nigeria.

MATERIALS AND METHODS

Study area

Abia State is the study area and was carved out of Imo State on the 27th of August, 1991, [1]. Abia state situates east of Imo State with which it shares common boundary on its West, North and Northeast by Anambra, Ebonyi and Enugu states respectively. The state is bounded on the East and Southeast by Cross River and Akwa Iboms States respectively while it shares its southern borders with Rivers State. Agriculture is the major occupation of the people of Abia State [1]. This is induced by the rich soil which stretches from the north to the southern parts of the State. There are three agricultural zones in the state namely Aba, Ohafia and Umuahia. Cash crops, such as oil-palm, cocoa and rubber are produced while food crops such as yam, cassava, plantain and maize are produced in large quantities.

Data collection and analysis

A multi-stage sampling technique was adopted in collecting data for this research. The first stage involved the selection of three LGAs from each of the three agricultural zones, precisely, Ikwuano LGA from Umuahia agricultural zone, Isiala Ngwa South LGA from Aba Agricultural zone and Bende LGA from Ohafia agricultural zone. In the second stage, six (6) autonomous communities were selected from each of the LGAs making a total of eighteen (18) autonomous communities. In the third stage, three (3) villages were selected from each of the selected autonomous communities making a total of fifty-four (54) villages. In the last stage, 20 farmers were selected from each of the villages to have a total of 1080 farmers. The Body Mass Index (BMI) which was derived from [15] was used to classify farmers as healthy and non-healthy. The BMI is derived by dividing the height (in Centimeter) of a respondent by the weight (in Kg).

RESULTS AND DISCUSSIONS

Body Mass Index

This study adopted BMI as the major measurement of farmers' health status. The BMI classification as well as BMI status of the farmers is presented in the Table 1 and Figure 1. The BMI classification used in this study was adopted from the World Health Organization records in [16].

Table 1.BMI classification

BMI (kg/m^2)	Description
Less than 18.5	Underweight
18.5 – 24.9	Normal
25.0 – 29.9	Overweight
30 – 39.9	Obese
40 and above	Morbidly obese

Source: WHO, 2013.

The BMI result shows that while none of the

farmers was morbidly overweight, 5%, 18%, 33% and 44% were obese, overweight, underweight and normal respectively. This implies that about 66% of the respondents were not healthy.

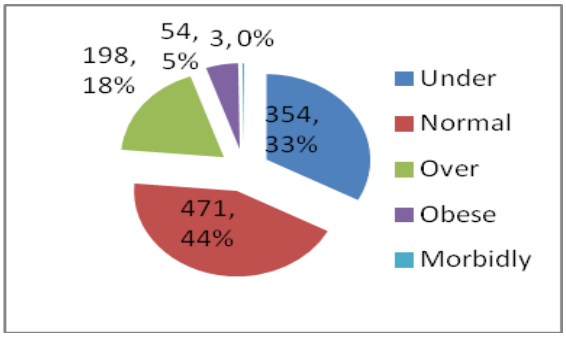

Fig. 1. BMI of the farmers
Source: Field survey, 2016.

This situation requires urgent policy interventions. Clearly, BMI is related to energy intake, net of output; it has also been shown to be related to maximum oxygen uptake during physical work, which is, in turn, related to aerobic capacity and endurance, independent of energy intake [12, 10] in [3]. Given this scenario, it is therefore expected that these farmers would be inefficient and less productive.

Sex-number of days lost due to incapacitation distribution of the farmers

Table 2 shows the distribution of the number of days lost due to incapacitation in relation to the sex of the farmers. The result in Table 2 shows that all the farmers lost more than 5 days due to disease incapacitation. However, the greatest percentage (43%) of the male farmers lost between 16 and 20 days while only 2% lost about 31 – 35 days. On the other hand, more than half (52%) of the female farmers lost about 16 – 20 days while 2% lost about 1 – 5 days. In general, female farmers lost an average of 19 days in a season while male farmers lost about 16.8 days. From intuition, women are more resilient than men and as such could be more stress-resistant. However, the higher number of days lost by female compared to male farmers may be as a result of the excessive exposure to farming operations.

Time and labour-use patterns for various farm activities

The time allocated to various farming activities as well as the use of family and or hired labour is expected to differ across the farm households given their health conditions. This result is presented in Tables 3 and 4.

Table 2. Distribution of farmers by Sex and number of days lost due to incapacitation

Number of days lost	Male		Female		Agregate	
	(f)	(%)	(f)	(%)	(f)	(%)
1 – 5	0	0	9	1	9	1
6 – 10	9	1	9	1	18	2
11 – 15	180	17	90	8	270	25
16 – 20	234	21	279	26	513	47
21 – 25	90	8	108	10	198	18
26 – 30	27	2	36	3	63	5
31 – 35	9	1	0	0	9	1
Total	**549**	**51**	**531**	**49**	**1080**	**100**
Mean	**16.8 days**		**19 days**			

Source: Field data survey, 2016.

The result showed that healthy households utilized family labour as their main source of labour supply for all their farm activities except for harvesting where 56% of them used hired labour. However for the non-healthy households, this was not so. Hired labour was used majorly for land clearing and burning, land cultivation and harvesting while they utilized family labour in the other activities. The implication of this is that they could not cope with the energy demands of the aforementioned activities but could manage themselves in the case of lesser energy-demanding activities.

The time use pattern result shows that on the average for all the farm activities, healthy farmers spent more time than non-healthy farmers.

There is a marked difference for time utilization considering the energy demands of

the various activities.

Table 3. Labour-use patterns

Labour used	Healthy		Non-healthy	
	Frequency	Percentage	Frequency	Percentage
Land clearing/burning				
Family labour	450	67	180	44
Hired labour	225	33	225	56
Land cultivation				
Family labour	390	58	135	33
Hired labour	285	42	270	67
Planting				
Family labour	675	100	360	89
Hired labour	0	0	45	11
Thinning/supplying				
Family labour	675	100	315	78
Hired labour	0	0	90	22
Weeding				
Family labour	525	78	270	67
Hired labour	150	22	135	33
Fertilizer application				
Family labour	480	71	261	64
Hired labour	195	29	144	36
Harvesting				
Family labour	300	44	117	29
Hired labour	375	56	288	71

Source: Field survey, 2016.

Table 4. Time use patterns for various farm activities

Time use (No. of hours)	Healthy		Unhealthy	
	Frequency	Percentage	Frequency	Percentage
Land clearing and burning				
< 2	0	0	180	44
2.0 – 3.9	270	40	225	56
4.0 – 5.9	345	51	-	-
6.0 – 7.9	60	9	-	-
Mean	3.77		1.8	
Land cultivation				
< 2	-	-	-	-
2.0 – 3.9	150	22	333	82
4.0 – 5.9	345	51	72	18
6.0 – 7.9	180	27	-	-
Mean	4.52		2.75	
Planting				
< 2	-	-	171	42
2.0 – 3.9	450	-	171	42
4.0 – 5.9	225	67	63	16
6.0 – 7.9	-	33	-	-
Mean	3.2		2.02	
Thinning/supplying				
< 2	-	-	207	51
2.0 – 3.9	420		198	49
4.0 – 5.9	255		-	-
6.0 – 7.9	-		-	-
Mean	3.2		1.64	
Weeding				
< 2	-	-	-	-
2.0 – 3.9	150	22	342	84
4.0 – 5.9	465	69	63	16
6.0 – 7.9	-	9	-	-
Mean	4.20	2.62		
Fertilizer application				
< 2	-	-	243	60
2.0 – 3.9	495	73	162	40
4.0 – 5.9	180	27	-	-
6.0 – 7.9	-	-	-	-
Mean	3.00		1.53	
Harvesting				
< 2	-	-	99	24
2.0 – 3.9	225	33	252	63
4.0 – 5.9	390	58	54	13
6.0 – 7.9	60	9	-	-
Mean	3.90		2.31	

Source: Field survey, 2016

For instance, land clearing and burning which are energy sapping activities had healthy farmers spending about 4 hours while non-healthy farmers could barely manage 2 hours. For land cultivation, the difference is also obvious. Summarily, since time is a human capital that determines the amount of labour supplied to agricultural activities, its depletion through disease incapacitations is sure to affect productivity both at short and long runs production cycles.

Major diseases affecting the farmers in the study area

This section presents the major identified diseases affecting the farmers. Only respondents who approached medical experts for diagnosis of specific diseases were studied. The diseases identified include common fevers/colds, malaria/typhoid, tuberculosis, hypertension, hepatitis, asthma, pneumonia, diabetes, arthritis and rheumatism. These diseases affected the various farm operations including land clearing/burning, land cultivation, planting, thinning/supplying, weeding, fertilizer application and harvesting. The results are presented in the Figures 2 to 7

Major diseases affecting land clearing and burning

The major diseases affecting land clearing and burning are shown in Figure 2.

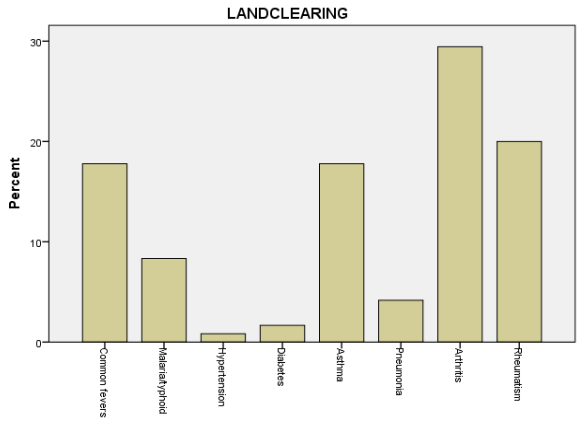

Fig. 2. Major diseases affecting land clearing and burning
Source: Field survey, 2016

The information on Figure 2 shows that arthritis, rheumatism, asthma and common fevers were the ill-health conditions that affected the farmers during land clearing and burning. Arthritis and rheumatism accounted for about 29% and 20% incapacitation of the farmers during this operation. Land clearing is one of the most tedious farm activities usually carried around late January and early March and requires a lot of energy to carry out. Although arthritis is expected to be most prevalent among the aged population, it affected majority of the farmers (who were middle-aged) during a number of farm operations including land clearing and burning. It showed a high correlation with rheumatism showing that they were aggravated by similar work operations and conditions. As expected, 18% of the farmers were affected by asthma during this period, especially because of burning. The spoke from the burnt bio-masses would have aggravated asthma in the farmers.

Major diseases affecting land cultivation

The major diseases affecting land cultivation are presented in Figure 3.

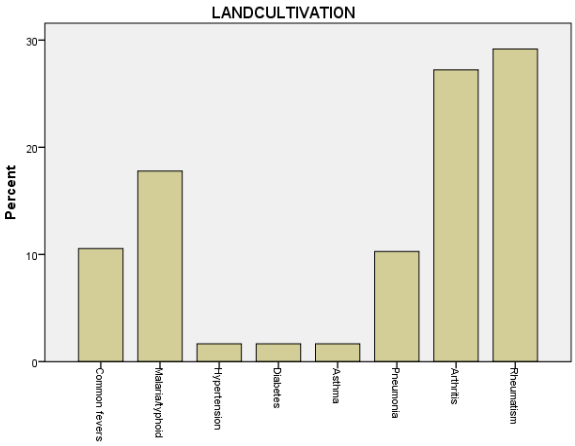

Fig. 3. Major diseases affecting land cultivation
Source: Field survey, 2016

The diseases affecting farmers during land cultivation in is presented in Figure 3 and shows that rheumatism, arthritis and malaria/typhoid were the most severe such that 29%, 27% and 18% of the farmers were affected respectively with an appreciable increase in the level of malaria infestation within this period. While malaria has remained a major killer in this region of the world, its morbidity is expected to rise with more of the rains. This study shows that

malaria episodes were higher in successive farm operations. A rise in pneumonia occurrence at this point more than at the period of land clearing lays more claims to the fact that majority of these diseases are responsive to climatic and weather changes. Land cultivation is usually carried out during early rains in March.

Major diseases affecting planting operation

The major diseases affecting planting are presented in Figure 4.

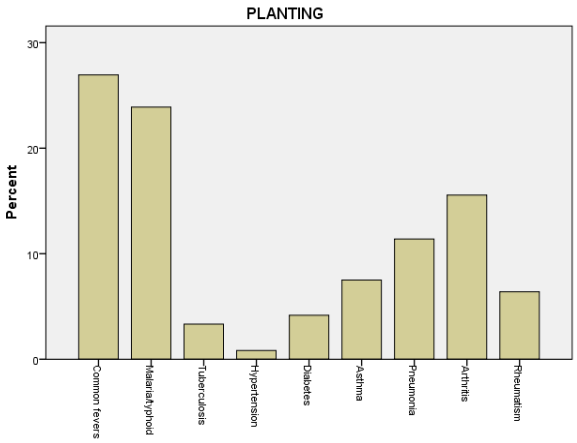

Fig. 4. Major diseases affecting planting operation
Source: Field survey, 2016

The information contained in Figure 4 shows that common fevers, malaria/typhoid and arthritis contributed to about 26%, 23% and 16% of the major diseases affecting planting operation respectively. Planting is usually done immediately after land cultivation in March and early April. It is less energy-intensive and may be majorly affected by common fevers. This explains why there was a marked decrease in the severity of arthritis and rheumatism in comparison to the previous farm operations. There was a slight increase in such diseases as tuberculosis (which is weather sensitive) as compared to land cultivation implying that there could have been more of rains and that the farmers might have been exposed to rains in the course of planting. With an increase in the volume of rainfall, mosquitoes tend to multiply. With mosquito bites, malaria infestation is sure to increase. This could be the reason for a rise in malaria occurrence.

Major diseases affecting thinning and supplying

The major diseases affecting thinning and supplying are shown in Figure 5.

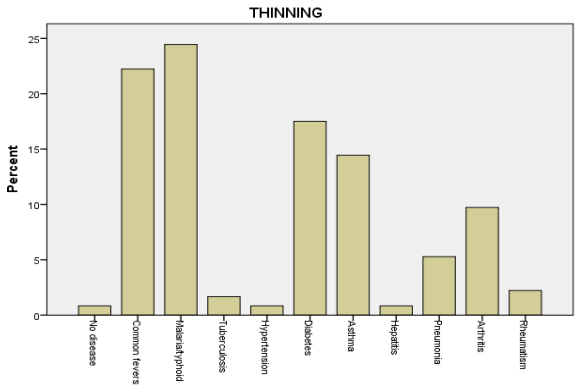

Fig. 5. Major diseases affecting thinning and supplying
Source: Field survey, 2016

As contained in Figure 5, thinning and supplying are usually done two to three weeks after planting, especially around mid-May. This period is usually marked by heavy rains explaining why farmers showed appreciable signs of diabetes and asthma during this period. Common knowledge holds that diabetic patients are unfriendly to heavy rains. There was also a decrease in the level of arthritis and rheumatism in this operation showing that since thinning and supplying are basically none-labour intensive, the principal operators may find it necessary to rest and free the mind of farm-related stress.

Major diseases affecting weeding operation

The major diseases affecting weeding operation are presented in Figure 6.

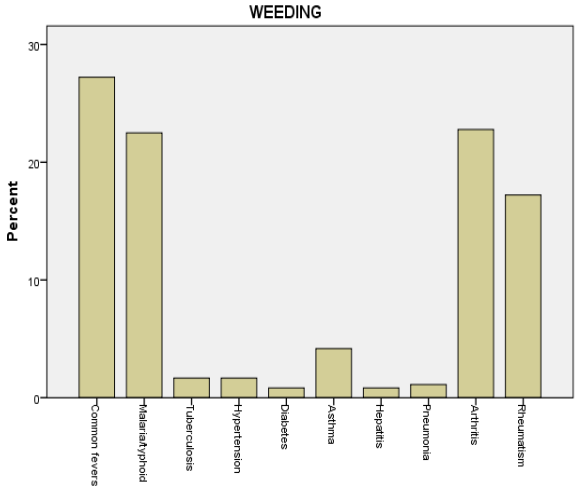

Fig. 6. Major diseases affecting weeding
Source: Field survey, 2016

The result in Figure 6 shows that about 27%, 23% and 22% of the farmers were affected by common fevers, arthritis and malaria respectively. This result is expected to have a strong link with thinning and supplying because these activities usually overlap and in most cases, these operations are carried out together and similar diseases may be prevalent. Depending on the nature of weed and growth, weeding is usually carried out simultaneously with fertilizer application, especially, around early June.

Major diseases affecting fertilizer application

The major diseases affecting fertilizer application are presented in Figure 7.

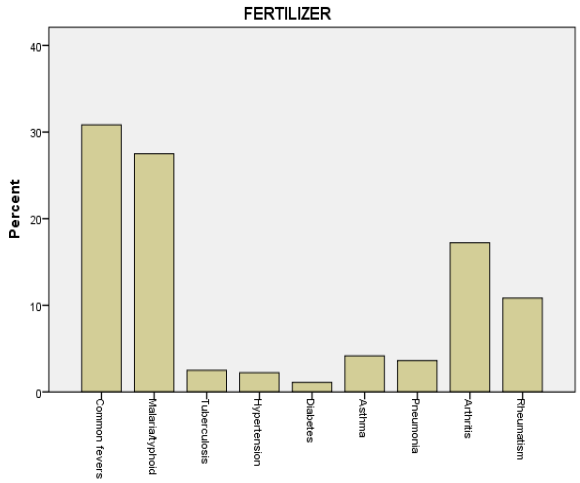

Fig. 7. Major diseases affecting fertilizer application
Source: Field survey, 2016

The result in Figure 7 on fertilizer application is similar to other farm operations. Common fevers, malaria and arthritis were the major health challenges faced by farmers during fertilizer application. Tuberculosis, asthma and pneumonia also showed appreciable increase during this period.

Major diseases affecting crop harvesting

The major diseases affecting crop harvesting are presented in Figure 8.

According to the result on crop harvesting, malaria was at its peak, followed by common fevers. Arthritis was low in comparison to other farm operations. Early harvesting starts usually in June.

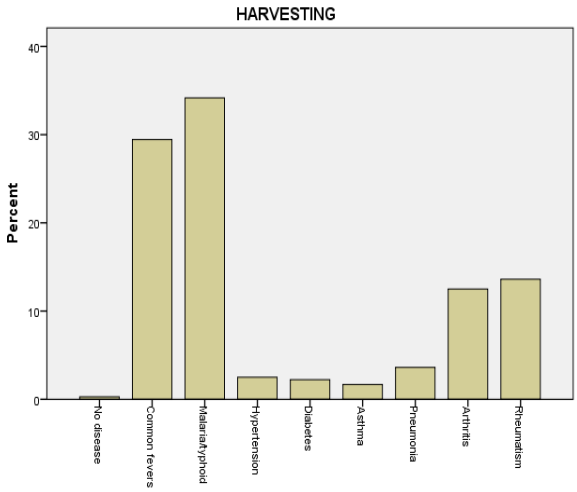

Fig. 8. Major diseases affecting harvesting
Source: Field survey, 2016

Number of days lost due to incapacitation in the various farming activities

The farmers were incapacitated and could not go to their farms due to the infestation of certain diseases. Some days were lost due to this incapacitation. This result is presented in the pie-chart below.

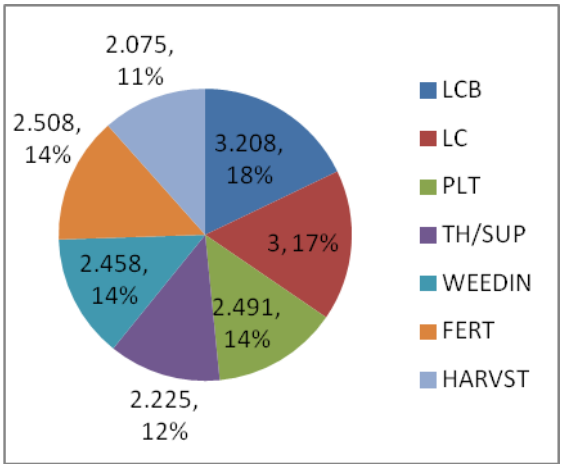

Fig. 9.Number of labour days lost due to incapacitation during farm operations
Source: Field data survey, 2016.

The result above shows that a total of 18%, 17%, 14%, 14%, 14%, 12% and 11% of labour days were lost due to the infestation of diseases in land clearing/bush burning, land cultivation, planting, weeding, fertilizer application, thinning/supplying and harvesting respectively. This finding is similar to [13] who found out that number of days lost to farming due to illness was most during land preparation, weeding (hoeing) and fertilizer application. These activities are usually

energy-sapping and have the tendency to increase the likelihood event for farmers to break down. Given the existent poor labour substitution, productivity is directly affected.

CONCLUSIONS

This study examined the major diseases affecting agricultural production in Abia state in line with the various time and prevalent labour-use patterns in the study area. The Body Mass Index (BMI) was used as a classification criterion to categorize farmers as healthy and non-healthy. The result showed an active farm population, relatively educated with limited land holdings. The anthropometric result showed that only about 44% of the farmers were healthy (using BMI) and it is therefore expected that they would be efficient and productive. On the average, the farmers lost about 18 days in a farming season due to incapacitation by diseases.

The labour-use pattern result showed that healthy households utilized family labour as their main source of labour supply for all their farm activities while hired labour was used majorly used for land clearing and burning, land cultivation and harvesting for non-healthy households. Similarly, the time use pattern result shows that on the average for all the farm activities, healthy farmers spent more time than non-healthy farmers. There is a marked difference for time utilization considering the energy demands of the various activities.

Arthritis, rheumatism, malaria/typhoid and asthma were the major diseases that affected the farmers during different cultural activities. The first two were the most severe for land clearing. Malaria was more severe as more rains fell. These farm activities are usually energy-sapping and have the tendency to increase the likelihood event for farmers to take ill. The study recommends that farmers adopt preventive measures to avoid undue exposure to harsh environmental conditions. This may involve the use of rain coats, rain boats, sunshades etc. An effective policy strategy with emphasis on health development by the government will be a welcome idea. To this effect, health education seminars on the impact of good health on agricultural productivity will be ideal. Arthritis, rheumatism and malaria were major ailments identified to affect farmers. Action programs to combat these health challenges by the government and non-government agencies is highly recommended. Provision of inputs at subsidized prices will go a long way in reducing the financial burdens faced by these poor households. As such, inputs market development with preference to rural based farmers would go a long way in achieving the goal of improved health condition, food production efficiency, sufficiency, security and general living standard.

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