

Full Length Research Paper

Labour cost implication of malaria and perception of cocoa farmers on its preventive measures in Ondo State, Nigeria

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The study was executed to examine the cost implication of labour used by cocoa farmers during periods of incapacitation caused by malaria and to determine the perception of the farmers on malaria preventive methods. Descriptive statistics were used to classify farmers by days of incapacitation and the cost of labour for cocoa plantation management when farmers were absent from the cocoa plantation because of malaria. A five-point Likert scale was used to determine the perception of farmers on various malaria preventive methods. The sample frame for the study was derived from secondary data obtained from records of Ondo State Ministry of Health on registered cocoa farmers who had malaria during the production season in 2015. Multi-stage, systematic and purposive samplings were used to select 180 respondents. The variables measured include: Number of days of incapacitation, additional labour cost incurred during periods of incapacitation and malaria preventive methods. The mean days of incapacitation were 24 days. It was revealed that farmers incurred extra expenses on: Pruning, harvesting, spraying, pollination and general farm sanitation.

Key words: Incapacitation, pruning, harvesting, spraying, pollination and five-point Likert scale.

INTRODUCTION

Malaria remains a major health challenge in many rural communities for some countries in Africa. Ajani and Ashagidigbi (2008) opined that among the major diseases that are common in Africa, malaria is one of the greatest threat facing development in Africa today. Assenso and Asante (2003) stated that “among the 109 malaria-prone countries and territories in tropical and sub-tropical regions, Africa, South of Sahara, is the hardest hit where over 90% of the estimated 1 to 2.5

million deaths occur annually.

Between 20 and 40% of outpatient visits and between 10 and 15% of hospital admissions in Africa are attributed to malaria.” In Nigeria malaria constitutes serious economic burdens to households through incapacitation and diversion of vital households’ productive resources to treatment of the sick (Ugbomoiko, 2013). Malaria is more common in rural farming communities, and transmission generally coincides with the planting and harvesting

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seasons and so may affect area cultivated and area harvested (Sauerborn et al., 1991)

According to Chuma et al. (2006), having high levels of malaria during the farming season has important negative implications on well-being over time. When malaria patients are not relieved of the ailment in the space of two weeks, the blood of such victims will be affected which can hinder the normal functions of the kidney and liver, thus causing patients to be incapacitated. Malaria therefore, can militate against farmers in their efforts to achieve maximum production yield in a cropping season and consequently affect their income. Many approaches have been employed to measure the economic burden of malaria in Nigeria but the most recent is the Willingness to Pay Approach (WIPA) by Jimoh et al. (2007). The study indicated that malaria imposes great burden on the society as its adverse effect is on the mental, physical and social well-being of people as well as on the economic development of a nation.

Yusuf et al. (2010) posited that "productivity and income losses from malaria infection can be perfectly linked to growing poverty. Among rural households, this is well understood from non-involvement of majority in wage/salary jobs, timeliness of farm activities with malaria sometimes striking at crucial time of planting, weeding and harvesting." An indirect effect of malaria on production capacity of farmers is reduction in productive time for routine farm management activities. Malaria morbidity, therefore, will affect the level of labour availability; because infected individuals may not have the capability of attending to their farmsteads and even if they do, labour inefficiency may result (Mohammed et al., 2018). Again, loss of man-days has direct income effects on workers of large farm holdings. Jeffery and Pia (2002) posited that foregone income is generally estimated by calculating the value of lost workdays as a result of malaria and malaria-related illness, based on estimated wages. Although these workers are not direct respondents for this study, it could be important to estimate this economic loss in future studies. The economic loss attributable to malaria could be much higher than documented evidence of farm workers affected by malaria. Jimoh (2005) suggested that for every reported case of malaria per 100,000 persons, the loss in agricultural output could be as high as ₦3.953 million. Jimoh (2005) also noted that for every reported case, many others are not reported and that each reported case may be a proxy for as many as 200 persons whose output is lost. It is therefore expedient for people living in malaria endemic areas to seek for several ways of malaria prevention.

This research focused on the cost incurred by owners of cocoa plantations who actively participate and manage workers' activities on their farms.

Generally, when some farm owners are incapacitated, or when some workers are affected by malaria, it is expected that more labourers are hired during such periods to minimize production losses. There is yet to be

record on additional labour cost estimates for cocoa farmers incapacitated by malaria in Nigeria. These costs could be reasonable and may negatively affect profits in a production season.

Most farm families living in malaria-endemic communities in Nigeria may be aware of one or more ways to prevent malaria incidence; however, their decision not to adopt ameliorative actions could be influenced by several reasons. Some of them may believe that malaria is a regular ailment that must occur during raining season of every year and thus may not be interested in acting consciously to prevent its occurrence. Others could avoid malaria preventive measures that attract costs and yet another group of farmers may not have the right perception of most malaria preventive strategies owing to lack of appropriate communication media to disseminate information to them respectively. In the light of these challenges, this study sought to investigate the number of days of incapacitation caused by malaria, the additional labour cost incurred by the farmers during periods of incapacitation and their perception on various malaria preventive measures. This study is justified by the need for evidence on additional labour costs that could erode profit margin of cocoa farm businesses in the study area and to investigate their level of knowledge on various malaria preventive measures. It is expected that findings from the study will help actors of cocoa value chain appreciate farmers' challenges posed by malaria in their bid to increase their level of productivity.

MATERIALS AND METHODS

Research design and duration

The research design was descriptive and cross-sectional. This study is a socio-economic research executed with the aid of well-structured questionnaires. The research was completed in 14 months that spanned between September, 2014 and December, 2015.

Sample and data collection

The study was carried out in Ondo State, Nigeria. Nigeria has 36 states while Ondo State has 18 Local Government Areas (LGAs). Multi-stage and proportionate sampling was used to select respondents. At the first stage, three LGAs noted for cocoa production were purposively chosen: Idanre, Ile-Oluji/Oke-Igbo and Owo. At the second stage, two villages were randomly selected from each of the chosen LGAs. The villages were: (1) Alade-Idanre and Atoshin-Idanre from Idanre, (2) Bankemo farm settlement and Odotu farm settlement from Ile-Oluji/Oke-Igbo and (3) Iyere and Isuada from Owo. At the third and final stage, proportionate sampling was used as follows: 35 cocoa farmers were randomly selected from each of the selected villages in Idanre, 30 cocoa farmers from each of the selected villages in Ile-Oluji/Oke-Igbo and 25 cocoa farmers from each of the selected villages in Owo. In all, 70 cocoa farmers were proportionately and randomly selected from Idanre, 60 cocoa farmers from Ile-Oluji/Oke-Igbo and 50 cocoa

Table 1. Numerical value of the scale points and their respective real limits.

Farmers' perception on malaria preventive measures	Point with real limit	Decision
Strongly Agree (SA)	5(4.50-4.90)	Informed
Agree (A)	4(3.50-4.49)	Informed
Undecided(U)	3(2.50-3.49)	Uninformed
Disagree(D)	2(1.50-2.49)	Uninformed
Strongly Disagree (SD)	1(0.5-1.49)	Uninformed

farmers from Owo. From the sampling frame of cocoa farmers in each of the LGAs, Idanre had the highest registered number of cocoa farmers with the Cocoa Farmers Association of Nigeria in Ondo State, followed by Ile-Oluji/Oke-Igbo and Owo. This informed the proportional selection method employed in the selection of respondents in each of the 3 LGAs. The sampling frame for the selection of the study units was obtained from records of the Ondo State Ministry of Health on cocoa farmers who visited local clinics and hospitals in the selected LGAs for malaria treatment in 2015. Only cocoa farm owners whose names were on the records of the Ondo State Ministry of Health were identified to be in the sampling frame of the study. These names were later selected from the list of registered cocoa farmers in Ondo State, to form the sampling frame of the study. The names and addresses of these farmers were then used to locate them. To avoid duplication of respondents, the names of cocoa farmers visited were noted and a village was visited at a time in each LGA before another village was visited.

Data analysis

STATA 10 software was used to analyze the data for the study. Descriptive statistics were used to investigate the days of incapacitation caused by malaria among the respondents and additional labour cost (in Naira) incurred during the days of incapacitation. A 5-point Likert scale was used to describe the perceptions of cocoa farmers on malaria preventive measures. It was specified as Strongly Agree (SA) 5 points, Agree (A) 4 points, Undecided (U) 3 points, Disagree (D) 2 points and Strongly Disagree (SD) 1 point. The mean response to each perception was interpreted using the concept of real limits of numbers. Examples of the Likert scale items and the respondent's responses are subsequently presented in the study findings. The numerical value of the scale points and their respective real limits are as shown in Table 1.

RESULTS

Effect of malaria on working days

The result of analysis on the days of incapacitation caused by malaria in a cropping season (Table 2) revealed that 9.4% of the respondents were incapacitated between 1 and 10 days, 37.2% of the respondents were incapacitated between 11 and 20 days, 29.5% of the respondents were incapacitated between 21 and 30 days, 14.4% of the respondents were incapacitated between 31 and 40 days, while 9.4% of the respondents were incapacitated for more than 40 days. Some of the farmers were not incapacitated, but frequently visited hospitals on

account of one or more close relatives working on their plantations that had malaria for prolonged periods.

Additional labour cost on various farm operations

Table 3 shows the distribution of respondents by additional labour cost incurred for various farm operations during periods of incapacitation caused by malaria. The mean cost of additional labour for timely harvesting was ₦21,375 Naira. 18 respondents spent below ₦10,000, 32 respondents spent between ₦10,000 - 20,000, 85 respondents spent between ₦20,001 - 30,000 and 14 respondents spent above ₦30,000. A total of 149 respondents spent part of their income on various sources of labour alternatives during a harvesting period. This indicates that malaria affected many cocoa farmers during the harvesting season.

The mean additional labour cost for timely spraying of various agrochemicals was ₦18,764. 15 respondents spent below ₦10,000, 28 respondents spent between ₦10,000 - 20,000, 37 respondents spent between ₦20,001 - 30,000 and 5 respondents spent above ₦30,000. A total of 85 respondents spent part of their income to hire labour for timely spraying of agrochemicals.

The mean additional labour cost for timely pollination is ₦10,000. 58 respondents spent below ₦10,000, 31 respondents spent between ₦10,000 - 20,000; while 9 respondents spent between ₦20,001 - 30,000. No respondent spent above ₦30,000 for pollination during an incapacitation period. A total of 98 respondents employed hired labour for timely pollination.

The mean cost of weeding is ₦6,522. 121 respondents spent below ₦10,000, 13 respondents spent between ₦10,000 - 20,000, and 4 respondents spent between ₦20,001 - 30,000. No respondent spent above ₦30,000. A total of 138 respondents spent part of their income on general sanitation and weeding. This could mean that many respondents were incapacitated during the rainy season as weeds aggressively grow during such periods, hence the need for hired labour for weeding to reduce the tendency for weeds that harbour pests, which could cause disease outbreak on their farms.

The mean cost of pruning incurred is ₦5,000. Only 43 respondents spent part of their income on pruning

Table 2. Distribution of respondents according to days of incapacitation.

Days of incapacitation	Frequency	Percentage
1-10	17	9.50
11-20	67	37.20
21-30	53	29.50
31-40	26	14.40
Above 40	17	9.40
Total	180	100.0

Mean days of incapacitation = 24.
Source: Field Survey (2015).

Table 3. Distribution of respondents according to additional labour cost on farm operations.

Cost in (₦) {\$1≈₦365}	Frequency					Total
	Spraying	Pollination	Harvesting	Weeding	Priming	
Below 10,000	15	58	18	121	43	255
10,001-20,000	28	31	32	13	0	104
29,001-30,000	37	9	85	4	0	135
30,001-40,000	5	0	14	0	0	19
Total	85	98	149	138	43	*513
MC	18,764	10,000	21,375	6,522	5,000	61,661

*Multiple responses, MC- Mean cost of farm operation.
Source: Field Survey (2015).

Table 4. Distribution of respondents by perception on various malaria preventive measures.

Perceptions statement	SA (5)	A (4)	U (3)	D (2)	SD (1)	Score	Mean	Ranking
Use of insecticide treated nets	515	168	27	18	16	744	4.13	1 st
Environmental sanitation	305	240	48	32	25	650	3.61	2 nd
Use of aerosol sprays	215	272	129	16	16	648	3.60	3 rd
Covering of areas with stagnant water	215	232	132	0	33	612	3.40	4 th
Use of preventive drugs	130	272	150	34	17	603	3.35	5 th
Use of oil on areas of stagnant water	95	44	219	116	17	491	2.73	6 th
Use of vaccines	80	136	156	66	43	481	2.67	7 th

SA=Strongly Agree, A=Agree, U= Undecided, D=Disagree, SD= Strongly Disagree.
Source: Field Survey (2015).

activity. This could mean that only cocoa farmers who were incapacitated for very long periods of time spent money on pruning, because pruning is not frequently carried out on cocoa farms as compared with the other farm management activities.

Perceptions of cocoa farmers on various malaria preventive measures

The perceptions of various malaria preventive measures

as measured by responses to the five-point Likert scale are presented in Table 4. From the results, the respondents agreed that the use of insecticide treated nets (Mean=4.13), environmental sanitation (Mean=3.61) and use of aerosol sprays (Mean=3.6) are common strategies used to prevent malaria incidence. The respondents were undecided that covering areas of stagnant water (Mean=3.4) and pouring oil on areas filled with water around the environment (Mean=2.73) are ways to prevent malaria. They were also undecided on the use of some drugs (Mean=3.35) and vaccination

(Mean=2.67) as other ways to prevent malaria infection.

DISCUSSION

The average days of incapacitation in the production season of 2015 was 24 days. This implies that malaria, to a large extent, causes absenteeism for a reasonable amount of productive time and consequently loss of output and revenue due to several factors amongst which could be additional labour cost for routine farm management activities, plant disease outbreak caused by poor monitoring of cocoa pods development and theft. A study by Isaac (2014), however, showed that the mean days of incapacitation of rice farmers in Southwest, Nigeria was 10 days. This could mean that the extent of the effect of malaria depends on the nature of crop cultivated. Oluyole et al. (2011) stated that the average number of days of incapacitation caused by malaria is 22 days per year and that during the period of incapacitation, farmers would not be able to do any work and hence would result in economic losses to the farmer. As a result of this, the higher the number of days of incapacitation, the higher the economic loss incurred by the farmers. Egbetokun et al. (2014) reported that for every single day a farmer is held down by sickness in the cropping season, there was 0.8049 reduction in his expected output. (Ugwu, 2006) also found that a farmer loses on the average 22 working days when incapacitated by one sickness or the other per time. These findings underpin the need for considerable efforts for malaria control in Nigeria.

The farm operation with the highest mean additional labour cost, incurred during periods of incapacitation is harvesting. This might be a result of perceived economic importance attributed to timely harvesting of cocoa fruits as compared with other farm management activities. This is confirmed by Omoare et al. (2016) who reported that almost all the respondents knew when the cocoa pod is mature for harvesting. Cocoa farmers could have little or nothing to harvest in their plantations if cocoa pods are not harvested at the right time for the following reasons: The cocoa fruits could rot when they become overripe on cocoa trees. In such case, there could be significant reduction in the quantity and quality of cocoa bean extracted from the cocoa pods. As a direct consequence, the income of the farmers could be negatively affected. Secondly, there could be cases of theft when cocoa pods are not harvested timely.

Findings from the study showed that the farmers perceived that the use of insecticide-treated nets, environmental sanitation and use of aerosol sprays are the major ways to prevent malaria infection. This result is in agreement with the findings reported by Abiodun and Abayomi (2013) who pointed out that 33.33% of respondents used mosquito nets while 12.50% used mosquito insecticide spray to prevent malaria incidence. Both malaria preventive measures were the most popular

among respondents in their study. It is expected that respondents with good perception on some malaria preventive measures could have used them, or may have close relatives and friends who are familiar with such measures of malaria prevention.

Adedotun et al. (2010) however reported that “while current international efforts at malaria control are targeted towards the use of Insecticide-Treated Nets (ITNs) for prevention via vector control, only 18.2% (35) of households in this study used it as a preventive method.” This might be premised on an uneven supply of ITNs to communities in the study area. The respondents were undecided on other malaria preventive methods which may indicate that many respondents care less on other ways of malaria prevention. This observation could be justified by Famuyiwa et al. (2014) who implied that the practice of preventive measures of environmental hazards associated with cocoa production were very low in the study area.

Conclusion

Bridging the gaps, Africa has everything to gain by investing in the fight against malaria which is already costing the continent's economy USD 12 billion a year in direct losses. The resources needed for malaria elimination are insignificant compared to those required to overcome the disease in case of resurgence, especially given the current resistance to drugs and insecticides (Ahmed, 2018). Thus, if more promotional campaigns, geared towards increasing knowledge on malaria prevention among residents in malaria prone regions of Africa are implemented, it would be easier to achieve near zero malaria in the African continent.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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