



Investigating the Determinants of Snakebite Cases Among Patients Attending Secondary Healthcare Facilities in Federal Capital Territory, Abuja, Nigeria

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Abstract

Original Research Article

The study was carried out in secondary healthcare facilities in Federal Capital Territory, Abuja to identify the species of snakes, age and the gender of snakebite victims, occupations that are most vulnerable to snakebites and determine the season that has the highest records of snakebite in the study area. A reconnaissance survey was carried out to identify communities where snakebites cases were predominant and from this the number of questionnaire were deduced. One hundred and fifty (150) questionnaires were administered to respondents in five (5) General Hospitals including Gwagwalada, Bwari, Gwarimpa, Maitama and Kuje. Data obtained were been processed and analyzed using Microsoft excel. Descriptive statistics such as bar charts, pie charts and figures were used to present data obtained from the study. The results show that 84 (56%) of the snakebite victims were male while 66 (44%) were female. Snakebite was highest among 21- 30 years while the least were among 51 years and above. The result also shows that farmers has the highest percentage of snakebite with the least being civil servants. The records indicate that most of the snakebite were on the farm 75 (50%) while 4 (3%) falls under others. Majority of the victims 123 (82%) were bitten on their legs while 27(18%) were bitten on their hands. Viper (*Echis ocellatus*) has the highest number of victims while python has the least. Result also shows that most of the snakebite occurs during rainy season with the month of April having the highest number of victims. Expansion of farmlands is the main cause of snakebites. Since snakebites mostly occur in farms protective clothing such as boots, hand gloves, trouser should be worn when working. There is also need to enlightened and educate communities on snake and snakebite risks.

Keywords: Snake Bite, General Hospital, Abuja, Nigeria.

INTRODUCTION

Nigeria is among the regions of the world that is rich in biodiversity. Nigeria has a total of 309 threatened species of snakes which includes 8 reptiles which is under pressure from

deforestation, urbanization, construction industries, bush burning, over hunting, climate change, habitat loss among others (Yohanna, 2017). Maintaining a high level of biodiversity is important to all life on earth, including humans, and snakes are an important part of that biodiversity. Snakes are

absolutely paramount to the health of many ecosystems, the environment and to biodiversity. They are extremely valuable components to the ecological communities in which they live; playing several complex roles, including that of predators and prey (Yohanna, 2017). Human-wildlife conflicts have resulted to human fatalities and injuries and retaliatory killing of wildlife which is the major threat to the survival of many wildlife species (Lumbonyi *et al.*, 2017). Conflict between humans and snakes occurs when people try to capture or kill a snake or disturb them in some way which results to snake bites. When left alone, snakes present little or no danger to people. Snakes are widely distributed in the world. More than 3000 known species of snakes have been identified globally, a vast majority of around 60%-80% are non-venomous (Sani *et al.*, 2013; Wang *et al.*, 2014). It is estimated that approximately five million people across the globe are bitten by snakes annually, causing around 125,000 deaths and 400,000 individuals to be permanently disabled or disfigured (Lancet, 2015).

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According to the Nigeria's National Population Commission and the National Bureau of Statistics (NBS) (2019), FCT has 3,564,000 populations as at 2016 population projection. However, more than 70% of the populations within FCT–Abuja were engaged in agricultural activities which makes them vulnerable to snake bite (Akani *et al.*, 2013). Snake bites is a major public health concern in FCT, Abuja with Oracle Foundation that was specifically established to cater for the poor and peasant farmers in the rural areas that are bitten by snakes but have no means of treatment spending over N30 Millions in treatment in three months. Records released by the Oracle Business Limited Foundation have indicated that it expended over ₦150 million on the treatment of snake bite

victims from 2013 till date (Akani *et al.*, 2013). Thus, over one hundred people usually received treatment for various degrees of snake bites in various health facilities in Nigeria per annum. Other States in Nigeria where snakebites are also common include Nasarawa, Benue, Kaduna, Taraba, Adamawa, Borno, Plateau, Jigawa, Niger, Kogi, Oyo, and Enugu States (Michael *et al.*, 2018). Notwithstanding, reliable data on morbidity and mortality due to snake bite in FCT–Abuja are scarce due to lack of community-based surveys. Consequently, this work sought to investigate the prevalence and distribution of snakebite cases in some selected secondary healthcare facilities in Abuja, North Central Nigeria.

MATERIALS AND METHODS

Study Area

The study was carried out in Federal Capital Territory, Abuja. It shares boundary with Niger State to the West and North, Kaduna State to the Northeast, Nasarawa State to the East and South and Kogi State to the Southwest. Lying between latitude 8.25 and 9.20 North of the equator and longitude 6.45 and 7.39 East Greenwich Meridian, Abuja is geographically located in the center of the country. The FCT has a landmass of approximately 7,315km² and it is situated within the Savannah region with moderate climatic conditions. The FCT has 3, 564, 000 population as at the population projection of 2016. Whereas, Abaji with 148, 600 population; Abuja Municipal Area Council with 1, 967, 500 population; Bwari with 581, 100 population; Gwagwalada with 402, 000 population; Kuje with 246, 400 population; and Kwali with 218, 400 population (NPC and NBS, 2019).

Reconnaissance Survey

A reconnaissance survey was carried out for two weeks in December, 2018 to identify communities where snakebites cases were predominant and where snakebite victims were being treated medically in FCT, Abuja.

Data Collection

Five (5) selected secondary healthcare facilities namely Gwagwalada, Bwari, Gwarimpa, Maitama & Kuje were purposefully selected for data collections. Questionnaires were administered in each General Hospital, making a total number of 150 respondents from January to June, 2019.

Data Analysis

The data collected were processed and analyzed through the use of Microsoft Excel. Descriptive statistics such as bar charts, pie charts, and figures were used to present data obtained from the study.

Ethical Clearance

Approval for this study was obtained from the selected secondary healthcare facilities, FCT, Abuja. The permission to collect data in these areas was also approved by the Chief

Medical Directors of the Hospitals. All participants were informed about the purpose of the study and were assured that their responses would be treated anonymously and confidentially. Written informed consent was obtained from all participants and they were free to withdraw from this study at any time without prejudice.

RESULTS

Figure 1 showed the distribution of the snakebite by the gender of the victims. Accordingly, the males were more infected than the females at a rate of 84% and 66% respectively. Figure 2 showed the distribution of the cases by age. Those victims within the bracket of 21–30 years had the highest cases of 46%; followed closely by those within age bracket 11–20 years and 41–50 years with a prevalence of 33% and 30% respectively. The least affected victims were aged 51 and above years (20%). Figure 3 showed the distribution of snakebite by occupation of

the victims. Notably, the farmers were the most affected with point prevalence of 59%; while the civil servants were the least affected with a prevalence of 21%. Figure 4 showed the distribution of the snakebite by species of the snake. It was observed that the Viper snake is the most encountered specie (45%); while the python snake is the least specie of the snake biting the victims. Figure 5 showed the prevalence of the snake bite by months. The highest incidence of the snakebite was recorded in the months of April (22%) and May (20%); while the least cases were recorded in the months of February (3%) and December (4%). Figure 6 showed the introduction of the snakebite victims based on the place where the bite takes place. Accordingly, majority of the victims were bitten by snakes in the farm (75%), followed by bushy areas (29%) and then outside or within the compounds (23%). Figure 7 showed the distribution of the snakebites by body parts affected. Majority of the bite, about 82% was in the legs, while 18% was on the hands of the victims.

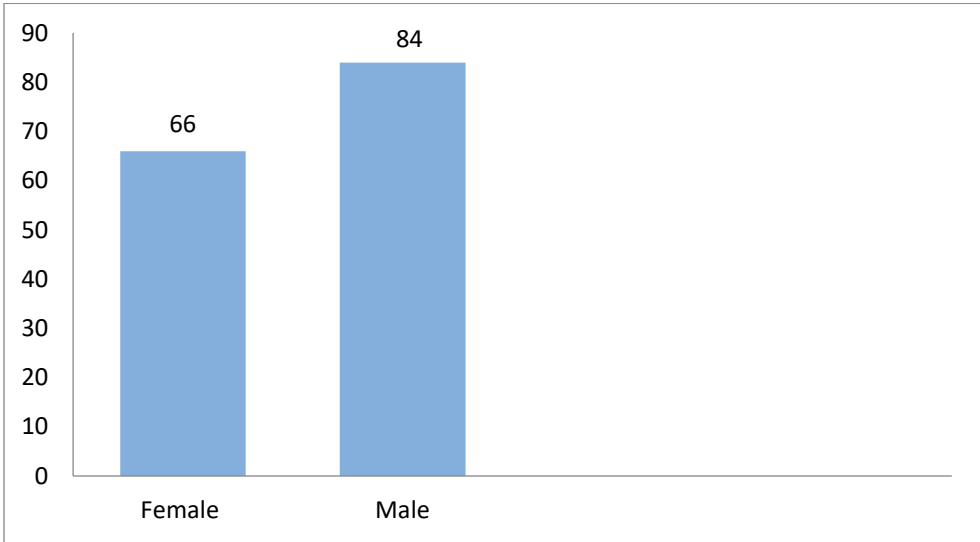


Figure 1: Distribution of the Snakebite Victims by Gender

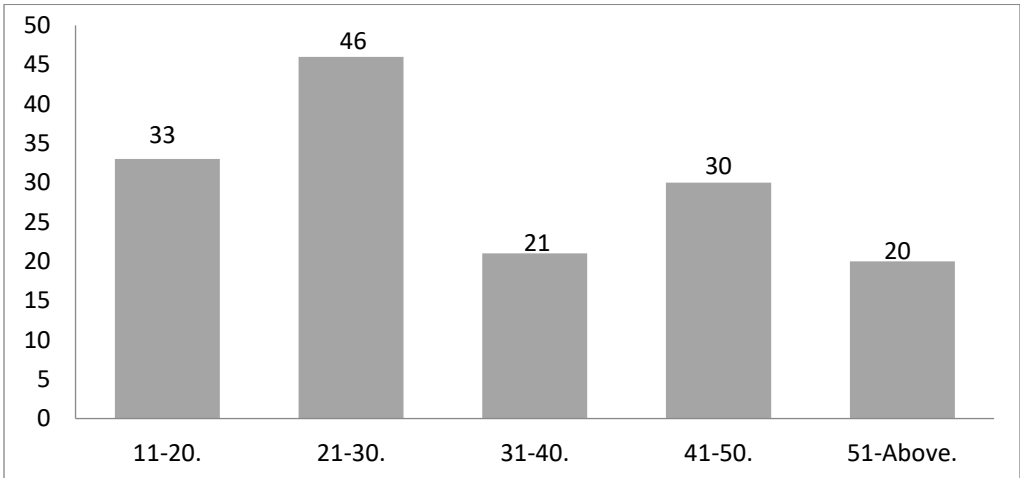


Figure 2: Distribution of the Snakebite Victims by Age



Figure 2: Distribution of Snakebite Victims by Occupation

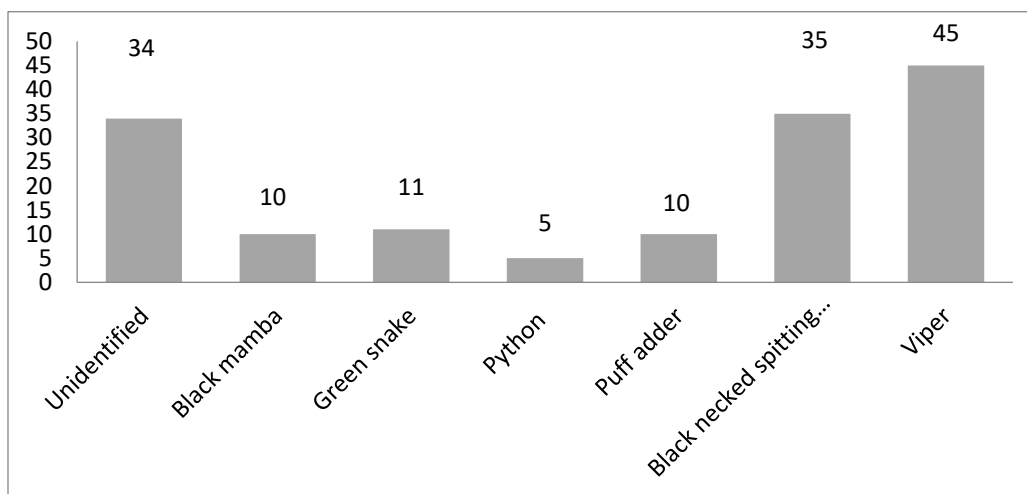


Figure 4: Distribution of snakebite victims by snake species

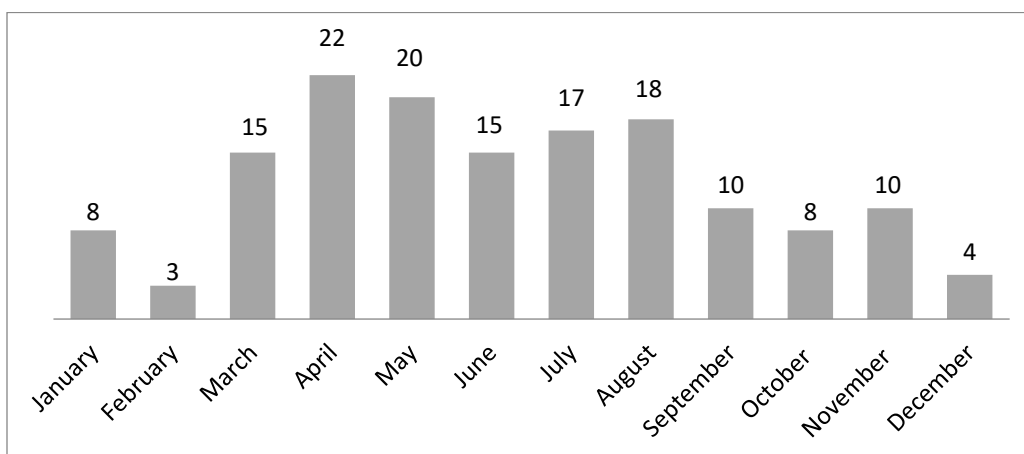


Figure 5: Monthly Distribution of Snakebite

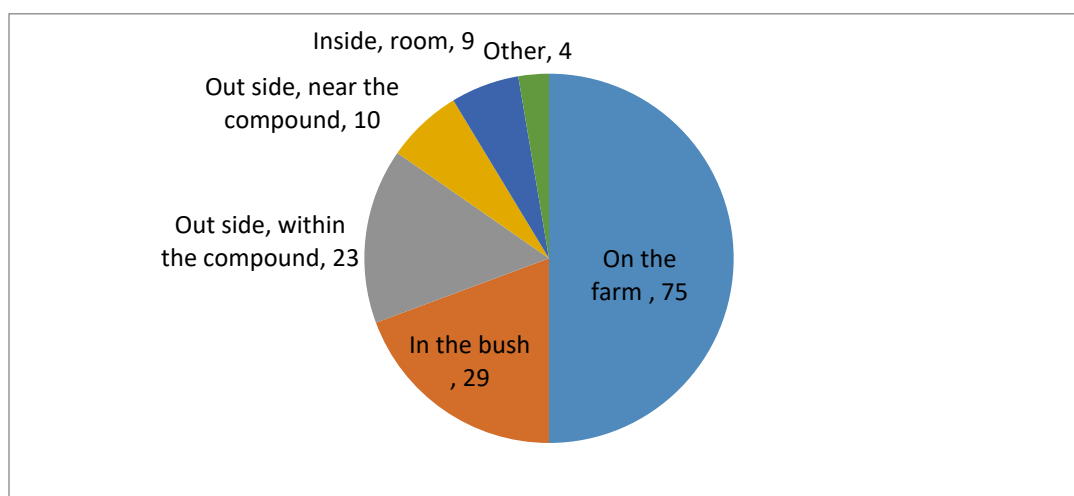


Figure 6: Distribution of the Snakebite Victims by Place

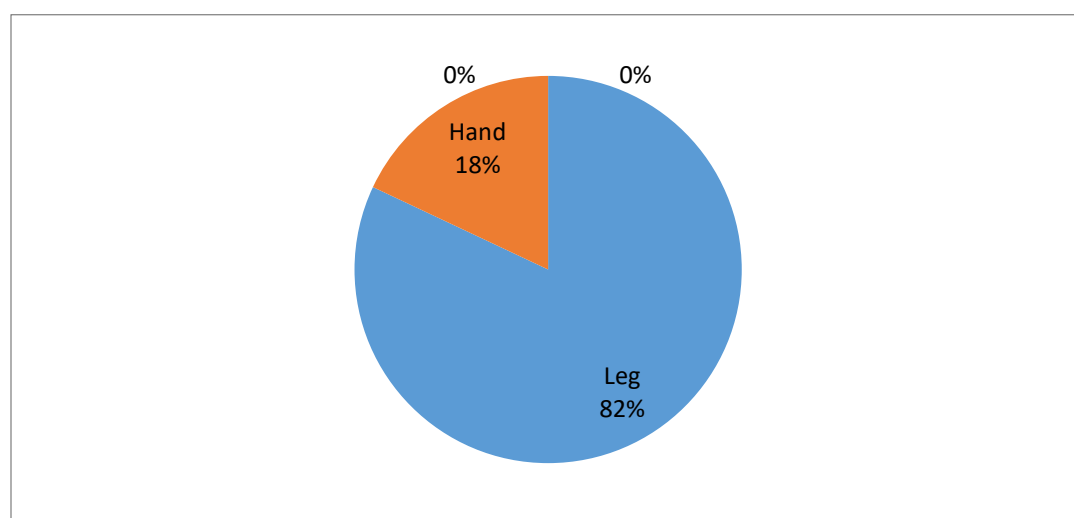


Figure 7: Distribution of the Snakebite Victims by Body Part

DISCUSSION AND CONCLUSION

Discussion

Snakebite envenoming is a major public health problem among rural communities in Nigeria. In this present study, snakebite was highest in males (56.0%) than in females (44.0%). This is understandable, because the male members of the various communities within Federal Capital Territory, Abuja are more involved in economic activities such as farming, fishing and other ventures which exposed them to the natural habitats of these snakes than the female population, majority of whom are full time housewives. This phenomenon had been extensively elaborated by Rahman *et al.* (2010) in his study of the incidence of snakebites in rural Bangladesh. Similarly, Jamaiah *et al.* (2004) noted high prevalence of snakebites amongst the males than the females in a retrospective analysis of snakebites in Malaysia and thus attributes it to the nature of activities peculiar to both sexes.

This assertion reinforced the findings of this present study which observed higher incidence in males than in females.

In the same vein, in terms of age, snakebites was highest among those aged 21-30 years (30.6%) followed by those within the age bracket 41-50 years (20.0%). Interestingly, these age brackets coincide with age of active economic activities which makes them vulnerable to snakebites as a result of their day to day ventures. The finding of this present study contradicts that of Karunanayake *et al.* (2014) which identify people of younger age to be more vulnerable to snakebites in their cohort study within North Central Province of Sri Lanka. The authors attribute this to the fact that unlike the adult population who are more cautious while working in habitats suspected to be inhabited by venomous or non-venomous snakes. The children are carefree while in the farm, or in the bushes or while playing under the moonlight at night. Nonetheless, the observations in this study correspond with those of Omogbai *et al.* (2002), Sharma *et al.*, (2004), Harris *et al.* (2010) and Mahmood *et al.*

(2018) who also reported higher incidence of snake bites amongst the economically-active members of the communities in their respective studies.

Occupational exposure and risk for snakebites had been extensively discussed by Chen and Colleagues (2010). In this present study, however, farmers with prevalence rate of 39.3% were the most affected than the other artisans and civil servants assessed in this research. In the field investigation of the incidence and management practices of snakebites in China, farmers were also the most affected, which is in consonance with the report of this present work. It is plausible to add that the natural ecology of snakes is the farmlands and bushes been them cold-blooded animals. This no doubt had contributed to the highest incidence recorded amongst this category of people; and the fact that farmers are rural dwellers make them more susceptible to be attacked by snakes and the situation is even made worse due to the lack of well-equipped health facilities within these localities.

More so, farmers due to their lack of awareness and poor health literacy are the worst affected. For instance, Kularatne *et al.* (2014) opined that once farmers were bitten by snakes, the farming activities may temporarily seize in the course of managing the problems which can lead to decrease in agricultural production. This also agrees with the work of Habib (2013) which noted that snakebites affects farmers, nomads and rural dwellers of all ages. They further described urban dwellers, and people of high social and economic class such as civil servants that works in offices and government building in cities to be less vulnerable to attacked by snakes.

Conversely, majority of the known species of snakes are non-venomous, and only about 15-20% are actually poisonous (Wang *et al.*, 2014). In this present study, snake species identified by victims include viper (*Echis ocellatus*), black spitting cobra (*Naja nigricollis*), Puff adder (*Bitis arietans*), python, green snake and the black mamba. Interestingly, the viper (*Echis ocellatus*) has the highest number of victims with 30.0% cases while python has the least with 3.3% cases. Vipers are the most offending snake species in this study, and this might be due to the fact that it is the most abundant snake species in Nigeria and indeed the whole of West Africa. This makes those examined in the study area to be more prone to attack by this snake species in view of the nature of the habitat been a Guinea Savannah characterized by the presence of abundant trees and long grasses. In addition, this observation is in line with previous reports such as those of Habib (2013) and Sani *et al.* (2013) that *Echis carinatus* (saw-scaled carpet viper), *Naja nigricollis* (spitting cobra) and *Bitis arietans* (Puff adder) are the species of snakes that are associated with envenoming in Nigeria and to a large extent West African sub-region and responsible for most of mortality and morbidity associated with snakebites in the sub-region. Significant numbers could not identify the species of snakes that bite them which agrees with Sani *et al* (2013) that accurate determination of the offending snake species is not always reliable in many parts of Africa. This is because the mode of identification of the snakes is usually by verbal description from witnesses.

Distribution of snakebite in terms of seasonal occurrence showed the highest cases in the months of April and May with point prevalence of 14.7% and 13.3% respectively. Typically,

snakebites are more common between April and May, because this is the period of intense farming activities as it coincides with the beginning of the rainy season as independently identified by Sharma *et al.* (2004) and Sani *et al.* (2013). Another reason why the cases of snakebites is highest during the month of April as observed in this study might be due to the fact that in Federal Capital Territory, Abuja, the month of April is very hot where temperature reaches over 40°C and since snakes are cold blooded animals, they move out of their habitats and roam about freely to cool off their body. Thus, humans may get bitten in the process as they invade the natural habitat of humans. This agrees with previous argument put forth by other workers such as Pandey *et al.* (2016) and Subedi *et al.* (2018) who demonstrated vividly in their work about snakes constantly leaving their abode to scavenge outside where human activities takes place.

Similarly, in terms of distribution of snakebite victims by places where the episode occur showed that majority of cases, about half (50.0%) occur in the farms, followed by 19.3% of cases which occurred in the bush. However, the lowest case, about 15.3% of the victims claimed that they were bitten by the snakes outside their homes or within their compounds. The reason for this trend may not be far from the fact that snakes always try to avoid human habitation and can only invade such places coincidentally. More so, outside house or within the compounds of the victims are characterized by high traffic of human activities such as pounding of yams, washing of dishes and clothes, sweeping of compounds, resting within the compounds, etc. Also, majority of houses of the victims had their compounds well cleared and cleaned which discourage snakes from invading such areas which expose them to attack by humans. This also corresponds with the reports of Kumar *et al.* (2015) on their analysis of myths that concern snakebites in Rural Bengal, India. Meanwhile, majority of the cases of snake bite in terms of body parts where the event occurred indicates that 82.0% of the victims were bitten on their legs compared to the 18.0% that were bitten in their hands. An earlier report by Omogbai *et al* (2002) and a more recent report by Michael *et al.* (2018) demonstrated that since snakes are crawling animals, humans can easily be bitten on their legs; this is because it is the closest parts of their body to the ground. This reinforced the finding of this present study, where the highest cases of snakebites were also on the legs.

CONCLUSION

Snakebites usually occurs when human intrude in snake habitat through land clearing for agricultural expansion which can result to local extinction of snakes in the area. Most of snakebite victims in the selected communities were farmers and most of the snake bite occurs on the farm which can affect food security. Protective clothing including boots, hand gloves and long trousers should be worn while working in the farm. People need to be enlightened on snakebite risks. Since the research was based on questionnaire, there is need for a further study to get records through inhabitants of FCT, Abuja. And finally, there is also need for field survey of snakes in the area.

In view of the findings above, the researchers are hereby presented the recommendations that the farmers should always

use personal protective clothing such as boots, trousers, hand glove etc when working in their farms; there should be proper awareness/education of the public on the effect of snakebite and its management; and government should provide the means of mechanization such as tractors in order to avoid manual labour by the farmers.

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None.

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