



Assessment of Status of Improved Beekeeping Technology and Use Practices in Selected Districts of East Shewa and West Arsi Zones of Oromia, Ethiopia

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Abstract: Survey was conducted to assess level of ownership and use of honeybee queen excluder in three districts viz. Kofale and Wondo from West Arsi zone; and Adami Tulu from East Shewa zone of Oromia Ethiopia. A total of Ninety beekeepers were purposively selected for interview. Data like ownership of modern hive and its accessories, improved skills to run beekeeping, practice on use of queen excluder and production of honey were collected. It was found that the beekeepers know how on use of queen excluder was found to be 66.67% at Wondo and at 75% Kofale and 66.6% at Adami Tulu. From this it can be concluded that generally in current study beekeepers were found to be better accustomed with use of Queen Excluder. However, the adoption of these device seems still in its infant stage and needs further promotion to make beekeepers in these areas aware of its benefits. And also the efficiency of the queen excluder was poorly or not determined so far and therefore, needs further investigation following different honey flow periods in the study areas and beyond.

Keywords: Beekeeping, Queen-Excluder, Pollen, Brood, Bee Colony

1. Introduction

Beekeeping is the art of managing honeybees sustainably for the purpose of tapping into the resource benefits. It is more than collecting and retaining bees in a hive and apiary, or putting a hive in an apiary and waiting to benefit from the bee colony. Beekeeping involves effectively and sustainably managing the bee colony [1]. It was reported that honey production is a complex characteristics of several factors and requires modern types of equipment and tools, applying appropriate beekeeping knowledge and skills, and accessing potential and profitable markets [2, 12, 13].

Among several things, beekeeping without understanding of local situation is nothing but wastage of time and other essential resources and will trivially contribute to economic and environmental sustainability [3]. Therefore, utilization of improved beekeeping technologies has to be made sure under real circumstances of a given beekeeping region for

successful and maximized profitability [4, 14, 15].

Ethiopia, in East Africa, with more than 10 million honeybee colonies and nearly 1 million beekeepers, has long made a beekeeping part and parcel of rural livelihood making and income generation activities. However, the way of keeping bees has been of a little value and is very traditional. This way of beekeeping was deemed 'not fit' by the government to meet current demands for honey in terms of quality and quantity [5, 6]. Hence, improved hives of different sorts have been introduced into the country. However, there are limited studies on the distribution and status of the improved hives and associated technologies on livelihoods and production [8, 11].

Therefore, this situation does justify that any honeybee management activities must be geared towards the nature of particular honeybee race, the climate, the season, the vegetation and geography. Management skill that can be practically applied under local condition plays a key role in

enabling beekeeping sector gainful [7].

Practice of beekeeping is not only depending on better strain of honeybees but also on abundance and occurrence of pollen and nectar sources within surrounding areas of an apiary [9, 10].

In Ethiopia, improved honeybee rearing technology has been in use for decades but with minimum impact on honey production [16]. Therefore, this study is designed to assess current status of improved beekeeping technologies under beekeepers condition with special focus on use practice of honeybee queen excluder in selected districts of East Shewa and West Arsi zones of Oromia, Ethiopia.

1.1. General Objective

The overall objective this study was assess current status of improved beekeeping technologies under beekeepers condition with special focus on use practice of honeybee queen excluder in selected districts of East Shewa and West Arsi zones of Oromia, Ethiopia.

1.2. Specific Objectives

The specific objectives of the research were:

1. To assess ownership and use practice of improved beekeeping technologies in selected beekeeping districts in West Arsi and East Shewa zones of Oromia
2. To determine extent of use of improved beekeeping technologies with special focus on use of honeybee queen excluder in selected districts of West Arsi and East Shewa Zones of Oromia

2. Materials and Methods

2.1. The Locations

This study was conducted in East Shewa and West Arsi zones of Oromia, Ethiopia. Three beekeeping districts, each one from different type of agro ecologies viz. Lowland

(Adami Tulu JidoKombolcha), midland (Wondo) and highland (Kofale) were purposively selected based on beekeeping potential and, accessibility.

2.2. Research Design and Methods

In December, 2021 an assessment was done in Adami Tulu Jido Kombolcha, Wondo and Kofale districts to know the extent of use of modern hive before the actual experiment setting up. From available beekeepers list in the districts, a total of thirty beekeepers per district was purposively interviewed.

Data on ownership and status of improved beekeeping technologies and their use practice was collected through questionnaire and checklists.

2.3. Method of Data Analysis

Data coding and entry was done in excel Microsoft office word and imported to Statistical package for social sciences (SPSS version 24). Frequency percentage was considered for analysis of nominal data.

3. Result and Discussion

3.1. Beekeepers Know How on Honeybee Queen-Excluder

Out of the total respondents asked the question 'do you know honeybee queen excluder and what it uses for? ', 33.3 % and 66.7 % of the respondents responded ' yes' and 'no' respectively at Adami Tulu Jido kombolcha; 75% and 25% responded ' yes' and 'no' respectively at Kofale; and 66.67% and 33.33% responded ' yes' and 'no' respectively at Wondo (Figure 1). Generally, the beekeepers know how was found to be better at the Midland agroecology (Wondo) with 66.67% response of 'yes' and at the highland agroecology (Kofale) with 75% response of 'yes' indicating that they are well accustomed with the use of Queen Excluder.

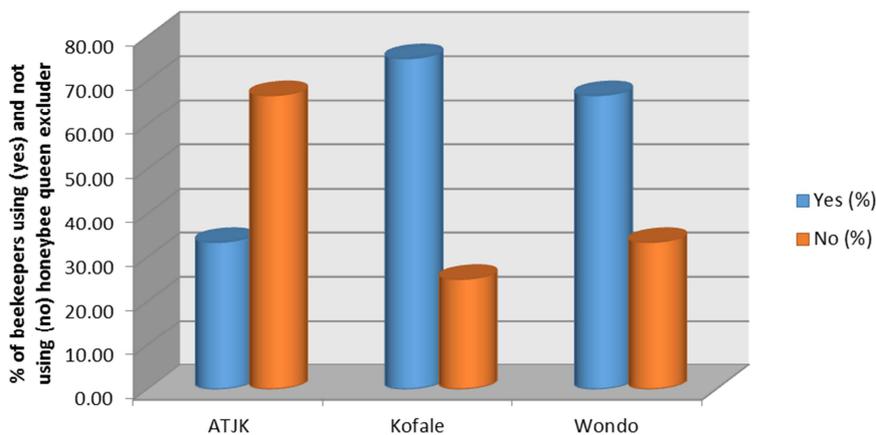


Figure 1. Responses of respondents on knowhow and uses of queen excluders.

3.2. Use and Ownership of Modern Hive

25% and 75% of the respondents own and do not own

honeybee queen excluder by responding 'yes' and 'no' respectively at Adami Tulu Jido kombolcha; 75% and 25% of the respondents own and do not own honeybee queen

excluder by responding 'yes' and 'no' respectively at Kofale; and 58.33% and 41.67% of the respondents own and do not own by responding 'yes' and 'no' respectively at Wondo. From this fact it can be deduced that beekeepers in midland

and highland agroecologies are more involved in modern hive beekeeping as compared to those of the lowland agroecology.

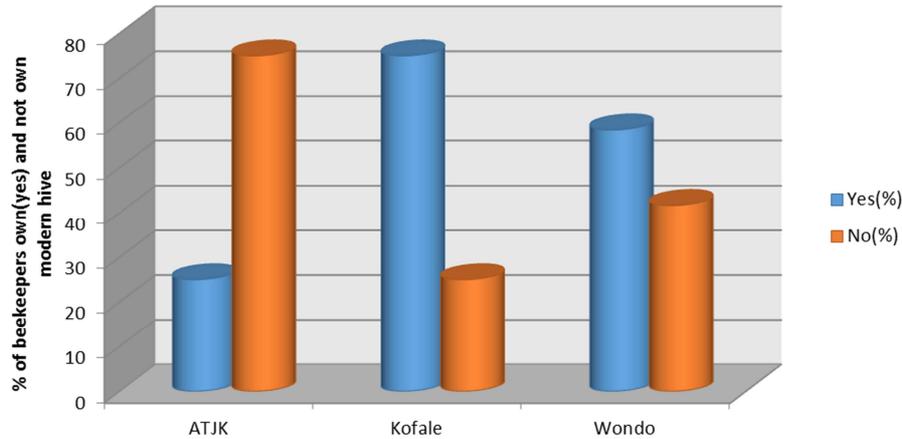


Figure 2. Modern hive ownership of respondents in the study areas.

3.3. Source of Improved Hive

According to this study, the respondent beekeepers' sources of honeybee colonies are as follows: 16.67%, 25%, and 58.33% from government, non-government, and private sources at Adami Tulu Jido Kombolch; 25%, 33.33%, and

41.67% from government, non-government, and private sources at Kofale; and 41.67%, 8.33%, and 50% from government, non-government, and private sources at Wondo. It can be inferred from this data that the responding beekeepers' modern hives' sources are almost entirely private.

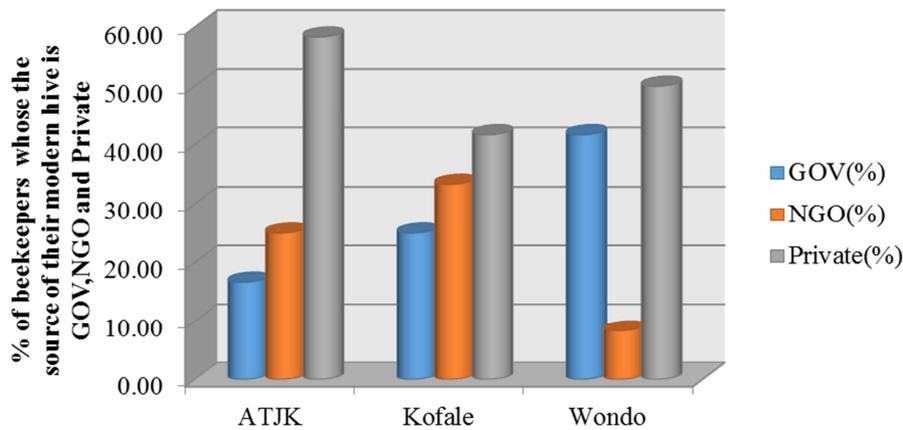


Figure 3. Respondent's source of modern hive.

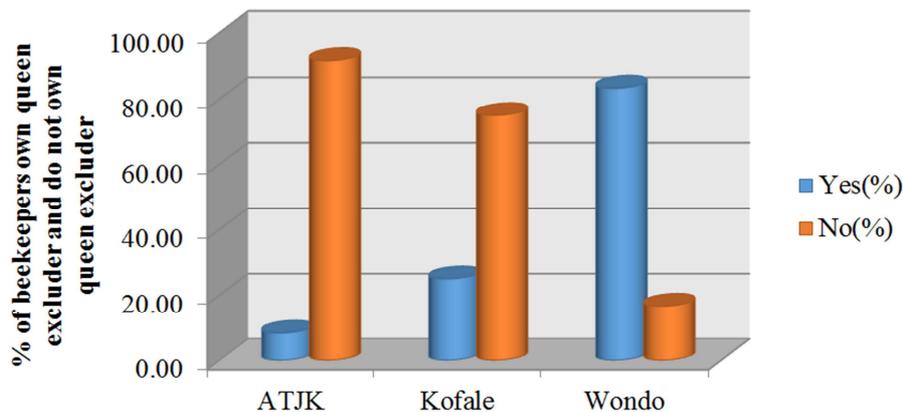


Figure 4. Queen excluder owned by respondents.

Queen excluder ownership of the beekeepers

In the current study, it was found that only 8.33% and 25%, respectively, of the respondents owned their own honeybee queen excluder at Adami Tulu Jido Kombloch and Kofale, while 83.33% of the respondents owned at Wondo. This shows that the majority of beekeepers in Wondo employ queen excluders, but adoption of these devices in Adami Tulu Jido Kombloch and the Kofale district is still in its infancy and needs further promotion to make beekeepers in these areas aware of its benefits.

3.4. Ownership of the Honeybee Colony

The average presence and absence of honeybee colonies in the modern hives kept by beekeepers in the study area were

discovered to be different (Figure 5). Average modern hives owned by beekeepers with and without honeybee colonies were observed to be 3.8 and 2.9 respectively in Wondo, 5.4 and 3.7 respectively in Kofale, and 4.6 and 3.1 respectively in Adami Tulu Jido Kombolcha. Kofale had the most average modern hives with honeybee colonies owned by beekeepers (5.4), while Wondo had the fewest (3.8). At Kofale, the average number of modern hives without honeybee colonies was reported to be the highest (3.7), while at Wondo, the average number was the lowest (2.9). This variation might happen in number of modern hives without honeybees among these districts because of several factors among which the beekeeping knowledge and skill can be one.

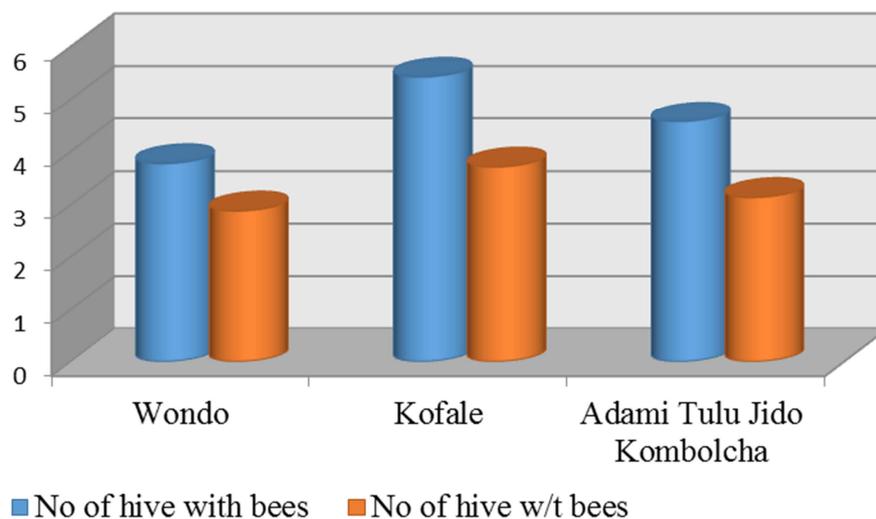


Figure 5. A beekeeper's average number of modern hives, both with and without honeybee colonies.

4. Conclusion and Recommendation

From this it can be concluded that generally in the current study beekeepers were found to be better accustomed with use of Queen Excluder. However, the adoption of these device seems still in its infant stage and needs further promotion to make beekeepers in these areas aware of its benefits. And also the efficiency of the queen excluder was poorly or not determined so far and therefore, needs further investigation following different honey flow periods in the study areas and beyond.

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