Human-wildlife conflict : A study of local perceptions in Jeli, Kelantan, Malaysia

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Abstract: The human-wildlife conflict happens when interaction between humans and wildlife occurs, resulting in undesirable influences on humans' social, economic and cultural life, wildlife populations or the environment. There are cases of human-wildlife conflicts that have affected the daily activities of both sides. An interview-based survey of human-wildlife conflict was conducted in Jeli, Kelantan, Malaysia to identify the villager's opinion and response when they face the conflicts. A total of 195 questionnaires were distributed to three subdistricts in Jeli. Awareness, perceptions, opinions, and observations of the nuisance behaviour of wildlife and the effectiveness of precautionary measures by the authorities were discussed. Results indicated that wild boars reported the highest number of cases of human-wildlife conflict. The primary reason given for these conflicts were over-hunting and urbanization. For the type of conflicts, the respondents who have observed the wildlife indicated the highest score and lastly the respondents had also identified the Department of Wildlife and National Park and Malaysia Civil Defence Department as the most effective and trusted government authorities to manage the human-wildlife conflicts.

Key words: Human-wildlife conflict, perceptions, Jeli, Kelantan

INTRODUCTION

The cases of human-wildlife conflict (HWC) increase annually in Malaysia, especially in Kelantan (Goldthorpe and Neo, 2011). There are two major factors that caused the conflict which are push and pull factors (Saaban et al., 2011). The push factor occurs when the wildlife habitat is destroyed by human for urbanization or economic activities. The over-hunting activities also make wildlife feel insecure to stay in their own habitats. However, the pull factors occurred when wildlife itself intrude into the human area because they are attracted to agriculture crops and livestocks that have been freed randomly (Saaban et al., 2011). Tigers, elephants, pigs, macaques, pythons, sunbears, water monitor lizards and wasps are wildlife have been identified to be frequently attacking the human in Malaysia (Chua et al., 2005). According to Jayaraj et al. (2013), most of the species are categorised in the endangered category. The conservation status of a wildlife species can be identified using the IUCN Red List of Threatened Species. The IUCN Red List's main purpose is to identify those species that are facing a high risk of global extinction and also determine the population pattern over time, breeding rates, and new threats (Vié et al., 2008).

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There are several reasons that have caused wildlife to become aggressive towards the community. Three main factors that have caused the wildlife population to decline are habitat destruction, deforestation and over-hunting. Habitat destruction is the effect of the urbanization, deforestation and industrial development (Abdullah and Hezri, 2008). The human population has been increasing drastically, causing the need for land to be utilized for urbanization and agricultural purposes. It will expand their urban area into natural wildlife territory and slightly change the habitat as large areas of forest have been converted to other land uses, like urban areas that force the wildlife to migrate and find new habitats for their survival (Abdullah and Hezri, 2008).

There are four types of hazard that causes degradation of forest that does not involve human activity. These are hydro-meteorological hazard, geological hazard, biological hazard, astrophysical hazard and climate change hazard (Mulugeta et al., 2007). Recently the Department of Wildlife and National Park (DWNP) recognised two levels of protection for wildlife in the Wildlife Conservation Act, 2010. The first level indicates that protected wildlife can be killed by licensed hunters (depending on the species and number of wildlife). On the other hand, the second level is identified as totally protected and cannot be hunted under any situations except for those specifically recognised in the legislation (DWNP, 2010).

MATERIALS AND METHODS

Study sites

The research was conducted in Jeli, Kelantan because of the higher number of human-wildlife conflict that have been occurring in the past few years making it one of the famous conflict location that needs special attention (Saleh, 2014). This study is more focused on village that lies at the fringe of the forest and area where human-wildlife conflict happened frequently. Jeli is an area of 1,280 km^2. The economic activities carried out in Jeli is greatly influenced by its geography factors that cover 82% of the state's land area which are hilly, forests and many rivers such as Sungai Pergau, Sungai Renyuk, Sungai Suda and Sungai Balah (Ahamad, 2014). These rivers supply much needed water to its agricultural plantations such as rubber, oil palm, paddy and fruits as well as livestock breeding and logging (Ahamad, 2014). Today, the development has increased drastically after a university was opened in Jeli and according to the Department of Land and Districts (Ahamad, 2014). Before the developments arrived to Jeli, it was well perceived as protected areas as shown in Figure 1 below.

Data collection

Questionnaire survey was conducted to collect data of human-wildlife conflict by collecting them from primary and secondary sources. For the primary sources, 195 data were collected from the villagers and victims of the conflict. Then, the secondary sources were collected by interviewing representative in the decision making level from Department of Wildlife and National Park, Village Development and Security Committee (JKKK), Department of Jeli Land and Districts, Fire and Rescue Department of Malaysia (BOMBA) and Malaysia Civil Defence Department (JPAM).

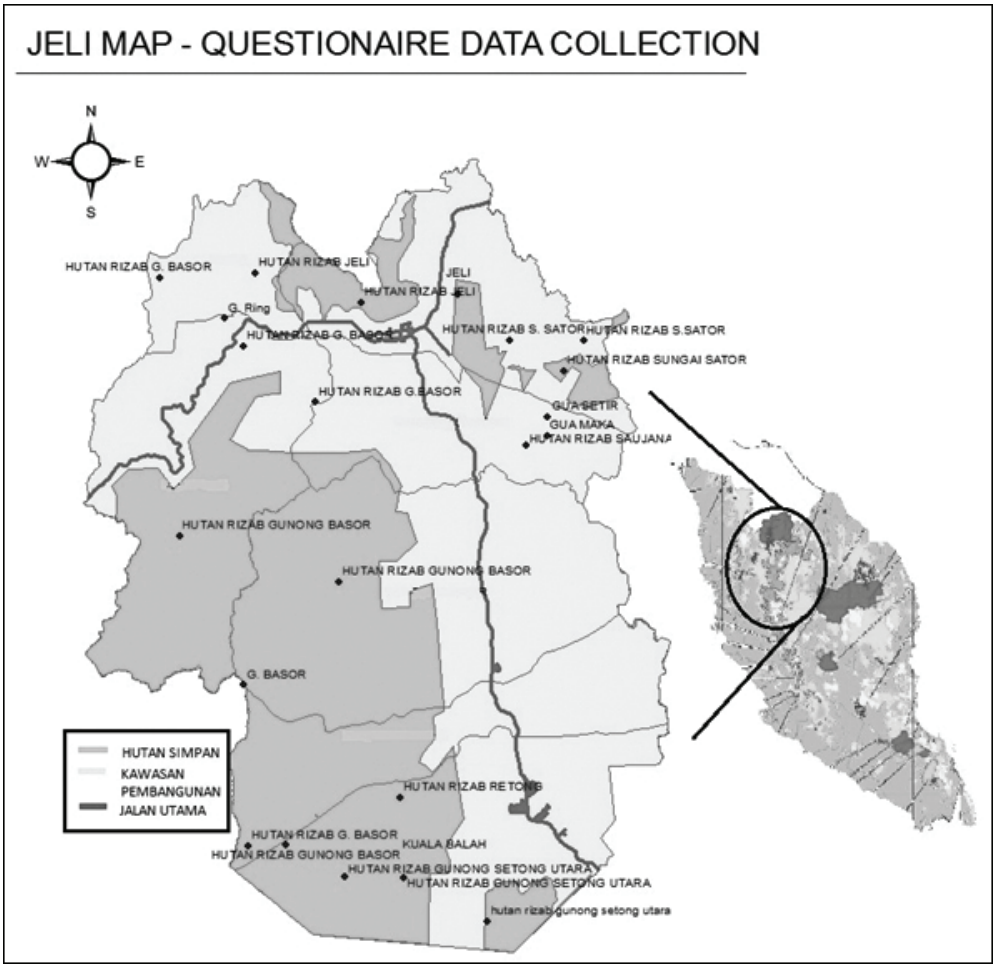


Figure 1. Map of study sites in Jeli (Dangermond, 2012; Vaz, 2015).

Data analysis

The common practices in Statistical Package for the Social Sciences (SPSS) is used to distinguish the community description by expressing the conflicts. It is conducted by manually typing the data obtained from the survey and questionnaire into the software. The analysis is more descriptive, which are frequency, percentage and mean (Quintero et al., 2012). Measuring wildlife conflicts can help to study about HWC distribution and determine the number of cases involved in HWC. As a result, analysis of variance (ANOVA) was used to test a categorical independent variable (with two or more categories) and a normally distributed interval dependent variable and to test the differences in means of the dependent variable broken down by the levels of one independent variable. It was also used to determine whether the means of several groups are all equal by calculating the p value (significant difference between three or more categories), for example the difference of data collected between villages in three different sub-districts of Jeli (Arslanturk et al., 2014). For this research, the fix independent variable is three districts in Jeli and the dependent variable are the questions in questionnaire. In particular, the ANOVA with post-hoc Tukey in this study was used to compare significant mean of (1) which wildlife have the highest score of HWCcase between three sub-districts in Jeli; (2) what kind of wildlife conflicts have the highest score of HWC case between three sub-districts in Jeli; (3) which government authorities have the highest score of respondents' choice between three sub-districts in Jeli; and (4) which opinion have the highest score chosen by respondent between four option given.

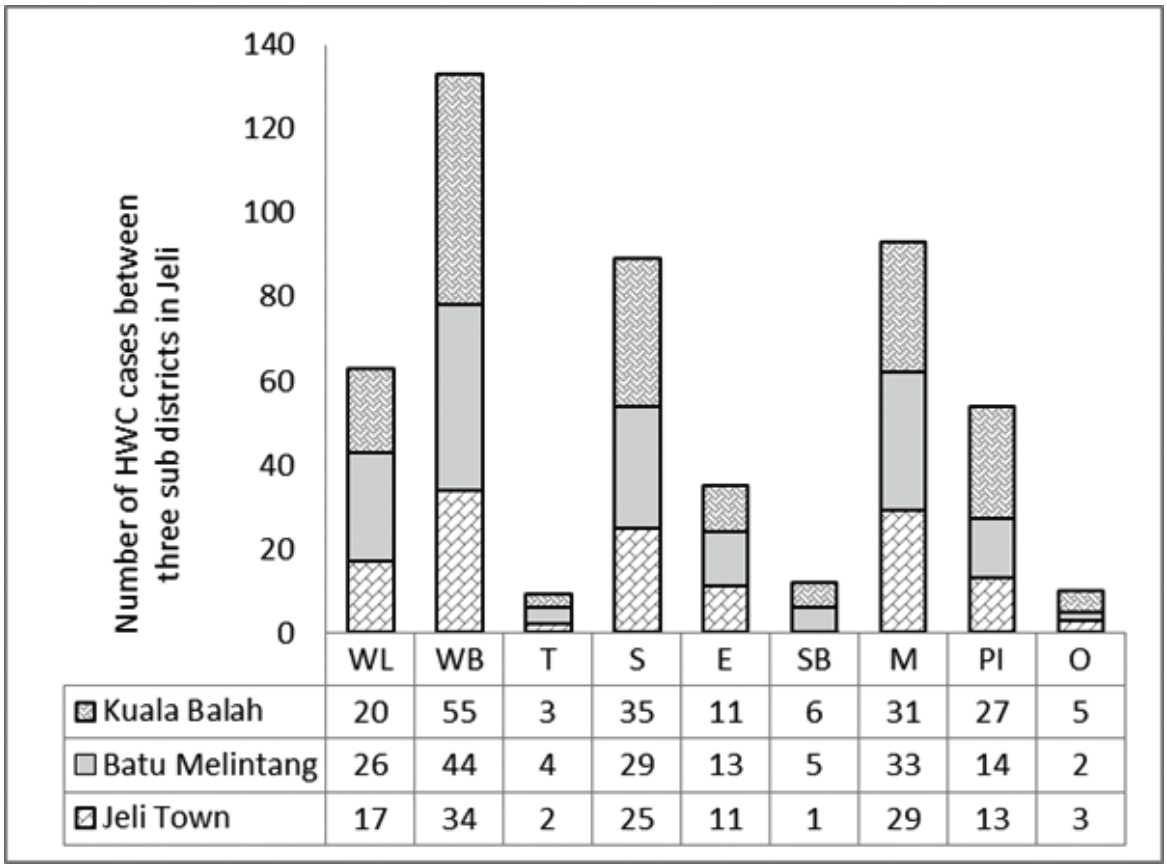
RESULTS AND DISCUSSION

Between 6 September and 8 October 2015, 195 interviews were carried out at the respondent's house, school and workplace. The interviews had been distributed into three subdistricts which mean 65 interviews done for each subdistrict. In each subdistrict, the interviews were conducted in an average of six or seven interviews per day. The ages of respondents were between 14 to 60 years, with a mean of 37. The percentage of interviews conducted with middle-aged villagers is the highest (45.13%), than teenagers (30.77%) and adults (24.10%). The middle-aged villagers were friendly and easier to answer the questionnaire than the adults and teenagers. Two third of respondents were men (70.77%) with the total of 138 per 195 people, and the rest are women (29.23%). From the data, most of the respondents are men because they have higher possibility to face the conflicts during work than women. The culture in Malaysia has limited the interaction between different gender and most of the women in Jeli work as housewives, thus it is hard to meet women in open places and minimizing the data of women respondents. The majority of ethnic in Jeli is dominated by Malays (95.88%) followed by Chinese (2.58%) and Indians as the minority ethnic (1.55%).

According to Ahamad (2014) the number of people in Jeli in 2000 was dominated by Malays at 98.9%, 1.1% are indigenous people and there are no data of other ethnics in Jeli. This study showed the majority of ethnic in Jeli is Malays, which is in line with the statement from Socio-Economic Profile of Kelantan. The geographical factors of Jeli that contains 82% of the state's land area greatly influenced the economic activities (occupation) carried out by the villagers. However, the hypothesis of occupation related with HWC percentage is higher than that unrelated with HWC is rejected because the data on occupation related with HWC (28.80%) is lower than occupation unrelated with HWC (71.20%). The occupation related with HWC indicates farmers had closer with wildlife. The example of occupation unrelated with HWC is government's servant who work in the government offices. The respondents who were interviewed are mostly Kelantanese (83.25%), which indicated that they are already familiar with HWC, different with the opinion of respondents from other states (16.75%) that mentioned the HWC in Kelantan is more frequent than in their state of origin.

The data showed the different types of wildlife cases in three sub-districts of Jeli. According to Ahamad (2014), there are 68 villages identified in Jeli which are divided into three sub-districts, Kuala Balah, Batu Melintang and Jeli Town. Jeli Town has the highest number of villages (31) followed by Batu Melintang (15) and Kuala Balah (20). The conflict between human and wildlife has frequently happened and were reported to The Department of Wildlife and National Park Jeli are water lizards, wild boars, tigers, snakes, elephants, sunbears, macaques, poisonous insects and others such as wild dogs, pythons, wild cows and goats (Awang, 2015). The cases of human-wildlife conflicts between three sub-districts in Jeli (Jeli Town, Batu Melintang and Kuala Balah) can be identified by the number of cases.

The data was then simplified to a total number of HWC and converted to bar chart of HWC case number comparison between three sub-districts in Jeli (Figure 2). The highest number of wildlife conflicts is in Kuala Balah (193) followed by Batu Melintang (170) and Jeli Town (135). According to the previous study by Goldthorpe and Neo (2011) and Jayaraj et al. (2013), the results of nine wildlife chosen for questionnaire indicated that numbers of wild boar, macaque, poisonous insects and others such as wild dogs, pythons, wild cows and goats have remained unchanged whilst tigers, snakes, elephants, sun bears and water lizards appear to have been depleted with possible localised extirpations of the latter. The primary reason given for these losses was over-hunting and over-logging. The data from the questionnaire has pointed out that the number of cases involving the wild boar, macaque, poisonous insects and others cases is higher than the number of tiger, snake, elephant, sun bear and water lizard cases. The comparison with previous study is acceptable with the data collected from the questionnaire.



	WL	WB	T	S	E	SB	M	PI	O
Kuala Balah	20	55	3	35	11	6	31	27	5
Batu Melintang	26	44	4	29	13	5	33	14	2
Jeli Town	17	34	2	25	11	1	29	13	3

* WL- water lizard; WB- wild boar; T- tiger; S- snake; E- elephant; SB- sun bear; M- macaque; PI- poisonous insects; O- others: wild dog, python, scorpion, wild cow and goat.

Figure 2. HWC case number comparison between three sub-districts in Jeli.

Figure 2 indicates the comparison of HWC case numbers between three sub-districts in Jeli. For the number of cases, the highest HWC case is in Kuala Balah where the conflicts were caused by wild boars followed by snakes, macaques, poisonous insects, water lizards, sun bears and tigers. The same result was also shown in Batu Melintang and Jeli Town, where the highest cases are dominated by wild boars. From the data, the assumption of the highest HWC cases dominated by wild boars is accepted. In the context of the wildlife cases, wild boar has the highest number (133), followed by macaque (93), snake (89), water lizard (63), poisonous insects (54), elephant (35), sun bear (12), others (10) and at the least number is tiger (9). Wild boar is hard to handle because of its population which is capable of expanding and establishing in new areas in a short time (Erkinaro, 1982). In addition, this study also supports the previous study conducted by Hambali et al. (2012) which states that macaque was one of the animals that often conflict with human through a variety of pest's behaviour.

Table 1 indicates the mean of HWC between three sub-districts where there are no significance differences ($P<0.05$) between all wildlife in three sub-districts except for wild boar ($P=0.01$) and poisonous insects ($P=0.023$). The highest mean indicates the lowest wildlife cases reported. Tiger cases has the highest mean and are reported in Jeli Town (1.97±0.17), followed by Kuala Balah (1.96±0.21) and Batu Melintang (1.94±0.24).Water lizard cases also have the highest mean is in Jeli Town (1.72±0.45), followed by Kuala Balah (1.67±0.47) and Batu Melintang (1.56±0.49). However, the mean of wild boar and

poisonous insects which were highest than others sub-districts is located in Jeli Town (1.45±0.50a) (1.77±0.42a), and it is statistically similar with Batu Melintang (1.31±0.47ab) (1.80±0.40ab) and higher than Kuala Balah (1.20±0.40b) (1.60±0.50b). The mean of snake cases is the same as others with the highest mean is recorded in Jeli Town (1.63±0.49 and 1.97±0.17) followed by Batu Melintang (1.52±0.50 and 1.95±0.21) and Kuala Balah (1.45±0.50 and 1.94±0.24). The highest mean of elephant and macaque cases are located in Jeli Town (1.89±0.31 and 1.58±0.50), followed by Kuala Balah (1.83±0.38 and 1.52±0.50) and Batu Melintang (1.77±0.42 and 1.46±0.50).

Table 1. Summary of mean±SD of HWC case between three sub-districts.

HWC case	Jeli Town	Batu Melintang	Kuala Balah	P - values
Tiger	1.97±0.17	1.94±0.24	1.96±0.21	0.708
Water Lizard	1.72±0.45	1.56±0.49	1.67±0.47	0.173
Wild Boar	1.45±0.50[a]	1.31±0.47[ab]	1.20±0.40[b]	0.010
Snake	1.63±0.49	1.52±0.50	1.45±0.50	0.107
Elephant	1.89±0.31	1.77±0.42	1.83±0.38	0.176
Sun Bear	1.98±0.12	1.90±0.29	1.89±0.31	0.093
Macaque	1.58±0.50	1.46±0.50	1.52±0.50	0.377
Poisonous Insects	1.77±0.42[a]	1.80±0.40[ab]	1.60±0.50[b]	0.023
Others	1.97±0.17	1.95±0.21	1.94±0.24	0.708

*All values are subjected to mean±SD with difference superscript are significant difference ($P<0.05$).

There are six kinds of conflict that commonly happened in HWC, which are the respondents observed the wildlife itself, they heard the sound of the wildlife or from its movement, the wildlife attack them directly, they have seen the wildlife footprints, their scratches on respondent's house or human territory and lastly the remnants left by wildlife like stools, fur and the damage of human properties. The data collected has shown the scratches effects are the highest mean percentage (19.83%), followed by attack directly (19.34%), footprints (16.32%), the remnants (16.26%), heard the wildlife activity (15.94%) and the lowest mean percentage is the respondent who have seen the conflicts (12.32%).

Table 2. Summary of mean±SD of kind of conflict between three sub-districts.

Conflict	Jeli Town	Batu Melintang	Kuala Balah	P - values
Seen	1.20±0.40	1.23±0.42	1.09±0.29	0.101
Heard (Sounds)	1.66±0.48[a]	1.58±0.50[ab]	1.31±0.47[b]	**0.000**
Attacked	1.80±0.40	1.88±0.33	1.86±0.35	0.450
Footprint effects	1.68±0.47[a]	1.58±0.50[ab]	1.41±0.50[b]	**0.007**
Scratches effect	1.94±0.24	1.89±0.31	1.84±0.37	0.240
Remnants (stools, Fur and the damage)	1.66±0.48[a]	1.57±0.49[ab]	1.42±0.50[b]	**0.022**

*All values are subjected to mean±SD with difference superscript are significant difference ($P<0.05$).

Table 2 above shows the mean of types of conflict cases in three sub-districts which indicated there are no significance differences ($P<0.05$) between all kind of conflict in three sub-districts except for hearing the noise ($P=0.000$), footprints ($P=0.007$) and remnants ($P=0.022$). The highest mean indicated the lowest kind of conflict's cases reported was direct observation that has the highest mean which are located in Batu Melintang (1.23±0.42), followed by Jeli Town (1.20±0.40) and Kuala Balah (1.09±0.29). Secondly, there is a statistical similarity between sub-districts such as heard of, footprint and remnants which means it has similarity between two of sub-districts but differ with the third district. The attack case is high in Batu Melintang (1.88±0.33), followed by Kuala Balah (1.86±0.35) and Jeli Town (1.80±0.40). The scratch case showed the highest score in Jeli Town (1.94±0.24), followed by Batu Melintang (1.89±0.31) and Kuala Balah (1.84±0.37). The pattern of wildlife moving in groups (53.35%) is higher than wildlife moving individually (46.65%). From the data, the assumption of the number of wildlife cases classified in social animal category such as wild boar, macaque, water lizard and elephant are higher than solitary animal such as snake, tiger, poisonous insects and others. The advantages of wildlife living in group are they can work together to find food and it is easier to care and protect other members. For the solitary animals, they have enough food and space without sharing with others (Schoepf and Schradin, 2012). The time of conflict occurred in the morning (35.03%) than in the afternoon (32.54%) and evening (32.43%). The reason of high number of HWC happens in the morning is because most of the wildlife are not nocturnal animal such as macaque, poisonous insects, water lizard, sun bear, tiger and others. Most of the respondents have encountered the wildlife when they were drinking at the water resource nearby the forest fringe and then moved back into the forest after sensing the presence of human. There are nine reactions of wildlife towards human that have been identified in this study (Awang, 2015) based on villagers complaints, which are killing people (KP), injuring man (IM), damaging properties (DP), crops (DC), killing livestock (KL), bringing fear (BF),wandering (W), harassing (H) and others (O). For this research the reactions is summarized to damage of properties (DP) and loss of life (KP).

The damage of properties is higher than loss of life. According to Ahamad (2014) the economic activities carried out in the district of Jeli is greatly influenced by its geography which support the agricultural plantations such as rubber, oil palm and fruits as well as livestock which are located near wildlife habitat, causing damage of properties to be higher than the loss of life. The damage of properties are grouped into two categories, the

damage that costs less than RM500 and those that cost more than RM500. The estimation damage that costs less than RM500 happened when wildlife disturbed human territory to find food. Most of the villagers affected own only small orchards.

The interaction and perception of villagers towards wildlife is one of the objectives of this study. The highest percentage of villagers' actions towards wildlife is indicated by acting alone either by installing electric fence (58.82%) or by shooting to kill the wildlife (41.8%). The second score indicated the villagers ignore the conflicts (31.02%) and last is the villager report to authorities about the conflicts (29.95%). From the interview, the villagers chose to act alone because they think it is more effective than reporting to authorities. They indicated that they are just trying to protect their agriculture crops from the wildlife and do not have any intention to kill the wildlife for fun or revenge for the damage of their properties.

Table 3. Summary of mean±SD of authorities can be referred regarding to HWC.

Authorities	Jeli Town	Batu Melintang	Kuala Balah	P - values
Department of Wildlife and National Park (DWNP)	1.61±0.49	1.57±0.50	1.52±0.50	0.589
Fire and Rescue Department of Malaysia (BOMBA)	1.70±0.46	1.74±0.44	1.79±0.41	0.598
Police	1.96±0.19	1.98±0.15	1.98±0.13	0.829
Village Development and Security Committee (JKKK)	1.67±0.48	1.57±0.50	1.68±0.47	0.499
Malaysia Civil Defence department (JPAM)	1.61±0.49	1.68±0.47	1.73±0.45	0.410

*All values are subjected to mean ±SD with difference superscript are significant difference ($P<0.05$).

Table 3 above shows the mean of authorities that can be referred regarding to HWC in three sub-districts which indicates no significance difference ($P<0.05$) between all authorities. The highest mean case is dominated by Department of Wildlife and National Park, located in Jeli Town (1.61±0.49), followed by Batu Melintang (1.57±0.50) and Kuala Balah (1.52±0.50). Second authority is Fire and Rescue Department of Malaysia with the highest mean score in Kuala Balah (1.79±0.41), followed by Batu Melintang (1.74±0.44) and Jeli Town (1.70±0.46). The Police Department has different score compared with others because its mean is similar in Batu Melintang and Kuala Balah (1.98±0.15) and lowest in Jeli Town (1.96±0.19). Mean in Batu Melintang between Department of Wildlife and National Park and Village Development and Security Committee has similarity with mean (1.57±0.50) and its lowest score compared to Jeli Town (1.67±0.48) and Kuala Balah (1.68±0.47). The last authority is Malaysia Civil Defence Department with the highest mean for Kuala Balah (1.73±0.45), followed by Batu Melintang (1.68±0.47) and Jeli Town (1.61±0.49).

In the interview, the probability of injury and plantation destruction by wildlife is low. They do not take the consideration of wildlife conservation as their part of responsibility because wildlife presence affects their daily activity. They tend to approach the poacher rather than government authorities if they sense the presence of wildlife in their area because their assumption that the poacher is more effective than the government authorities. About 76.60% of respondents have accepted that they know there is government authority to help them reduce conflicts and 23.40% don't know the existence of government authority. The reason why 23.40% respondents don't know the existence of government authority is that their villages are located far from the town. The rate of authority success in solving the conflict is also important to attract the interest of villagers to report the conflicts; the percentage of respondent acceptance towards authority's efforts is 70.24% higher than respondent who disagreed with authorities to resolve the conflict 29.76%.

Accordingly the mean percentage of no conflict happened in Kuala Balah (41.38%) is highest compared with other sub-districts, which mean it has highest effectiveness of government involvement than Jeli Town (31.03%) and Batu Melintang (27.59%). For the unchanged conflict, the district of Jeli Town get highest score with (40.86%), followed by Kuala Balah (33.33%) and Batu Melintang (25.81%) which means that the government effort in Jeli Town are accepted by villagers. The seldom conflict occurrence is highest in Batu Melintang (42.11%), followed by Jeli Town (31.58%) and Kuala Balah (26.32%). The government efforts which give negative feedback to villagers, by make the conflicts to become more serious is highest in Batu Melintang (44.44%), followed by Kuala Balah (33.33%) and Jeli Town (22.22%). This situation can happen if the wildlife is desperate to protect their territory for food and protection which make them more aggressive. The conclusion for villager's opinion on effectiveness of government involvement is the conflict that happen is the same as before the government involvement is highest (55.03%), followed by the seldom conflict (22.49%), no conflicts (17.16%), and serious conflict (5.33%). The total percentage of villagers that agreed with protection efforts is higher (97.89%) than those who reject the program (2.11%). The respondents that do not support the protection program are highest in Batu Melintang (1.05%) which exceeds half of number in Jeli Town (0.53%) and Kuala Balah (0.53%). The percentage of villagers that agreed with protection program is quite similar within three sub-districts (between 32% and 33%), this means the villagers in three sub-districts of Jeli have high awareness of the essential of protection program. The people who disagreed with protection efforts show that there are still people who have low awareness with positive method done by government in Jeli.

The answers for this question are divided into three options, which are habitat destruction, lack of foods resources and institution weakness. The total percentage of villagers that agreed with habitat destruction as the major reason of conflicts occurrence is the highest score (78.43%) followed by lack food resources (16.34%) and institution weakness (5.23%). The habitat destruction is highest in Jeli Town (35.83%), followed by Kuala Balah (32.5%) and Batu Melintang (31.67%). Batu Melintang has the highest score of villagers that agreed with the option of lack of foods resources causes of the wildlife to disturb human territory (52%), both of Jeli Town and Kuala Balah share the same percentage (24%). The institution weaknesses mean the government organisation do not perform their duties effectively, thus causing the conflict to happen. The villagers that consider the institution weakness, as the causes of conflicts are highest in Batu Melintang (50%) exceed half of villagers in Jeli Town (25%) and Kuala Balah (25%).

Table 4. The mean±SD of the efficient steps that should be taken by the authorities.

The most efficient way that should be done by the authorities	Jeli Town	Batu Melintang	Kuala Balah	P - values
Regular monitoring in areas of conflict occurs	1.34±0.48	1.27±0.45	1.46±0.50	0.065
Trapping of wildlife in conflict-prone areas	1.61±0.49	1.56±0.50	1.51±0.50	0.513
Providing an electric fence in the orchards	1.78±0.42[a]	1.67±0.48[ab]	1.48±0.50[b]	**0.001**
Set up an agency with residents to resolve this conflict.	1.58±0.50	1.54±0.50	1.51±0.50	0.727

*All values are subjected to mean ±SD with difference superscript are significant difference ($P<0.05$)

Table 4 shows the mean of the efficient steps that should be taken by the authorities in three sub-districts. There are no significance difference ($P<0.05$) between authorities except with providing an electric fence in the orchards ($P=0.001$). The highest mean indicates the least choice of opinion by respondent, the highest mean of regular monitoring in areas of conflict occurs are located in Kuala Balah (1.46±0.50), followed by Jeli Town (1.34±0.48) and Batu Melintang (1.27±0.45). Second opinion is trapping of wildlife in conflict-prone areas; its highest mean score is located in Jeli Town (1.61±0.49), follow by Batu Melintang (1.56±0.50) and Kuala Balah (1.51±0.50). Third opinion has different score compare with other because it is statistically similar between sub-districts. The highest mean is Jeli Town (1.78±0.42a), followed by Batu Melintang (1.67±0.48ab) and Kuala Balah (1.48±0.50b). Last opinion is setting up an agency with residents to resolve this conflict. Mean is similar as third opinion that highest in Jeli Town (1.58±0.50), followed by Batu Melintang (1.54±0.50) and Kuala Balah (1.51±0.50).

The total percentage of villagers that agreed to join the conflict prevention activities is higher (92.90%) than who disagreed (7.10%). The respondents that do not want to join the conflict prevention activities is highest in Batu Melintang (53.85%) exceed the number in Jeli Town (30.77%) and Kuala Balah (15.38%). The percentage of villagers that agreed with protection program is quite similar between Jeli Town and Kuala Balah (34.71%); and both are higher than in Batu Melintang (30.59%). From the data, the assumption made is the villagers in Batu Melintang have low awareness of the benefit to join the conflict prevention activities. For the open-ended question the respondent, need to give their opinion. The answer given by the respondent are listed in Table 5 below.

Table 5. The opinion of respondent to open ended question.

Question: If you have other ideas that can solve this conflict, what is the idea?
The respondents' answers:
1) Stop illegal logging.
2) Build a special zoo to endangered animals.
3) Families who live in areas of conflict have the right to use weapons.
4) Transfer the wildlife to a safer area.
5) Increase the forest reserves in the area of conflict.
6) The authorities need to perform their duties effectively.
7) Stop deforestation.
8) Establish an agency of community service to help the villagers when conflicts occur.
9) Kill the wildlife.
10) Increasing the association and animal lovers club, founding animal lovers club or association.
11) Protect the environment together.
12) The government strengthened the law related to the conflict.
13) Use biological controls in place of the control that causes wildlife to be killed.

CONCLUSION

As conclusion, this research was conducted from 6 September to 8 October 2015 with 65 interviews done for each sub-districts. The objectives were to characterise type of wildlife involve in human-wildlife conflicts, to estimate kind of conflict and community respond toward wildlife conflict and also to determine the most effective government authorities that are trusted by respondent, was fulfilled successfully. The highest case in Jeli is dominated by wild boar. For the kind of conflicts, the respondents who have seen the wildlife are the highest score. The respondents had chosen Department of Wildlife and National Park (DWNP) and Malaysia Civil Defence Department (JPAM) as the most effective and trusted government authorities to manage the human-wildlife conflicts in Jeli, Kelantan.

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