

## **Knowledge, Attitude and Practice of Pesticide Use among Oil Palm Smallholders in Sandakan, Sabah.**

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**Abstract:** A study on knowledge, altitude, and practices of pesticide usage among small holder oil palm farmers were conducted in Sandakan, Sabah. 50 respondents were chosen to be part of the study and were questioned on their demographic background, knowledge and practices of the pesticide usage. The survey questionnaire also covers on symptoms of pesticides poisoning experienced by the respondents. Majority of the respondents were men age between 31 years old to 40 years old with their education level was only at the primary school with 6 to 10 years of experience in pesticide handling. Score method was used to determine the farmer's knowledge, attitude and practices and it shows that 72% of the respondent has a high level of pesticides handling knowledge along with good attitudes and practices. Correlation analysis suggesting that the more experience they have, the higher knowledge on pesticide usage they gain and makes them a better user. However based on the interviewed this was more on transfer knowledge of routine daily works from their senior or worker before them. Some of them also experience symptoms of positioning such as itchiness, nausea and headache direct after spraying signifying that sometimes the daily practice was just not in line with their knowledge and the good pesticide handling practice which implemented by the local authorities.

**Keywords:** Attitude, knowledge, oil palm farmer, pesticide handling, practice

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### **I. Introduction**

Oil palm agriculture is one of Malaysia's most important economic resources. Oil palm is grown on a commercial scale began in the early 1980s and became a major crop in Sandakan, Sabah. This agricultural expansion is leading to an increase in pesticide application. Some studies in other countries shows that oil palm smallholders most likely to use excessive pesticide to produce more yield and making them more exposed to higher risks of pesticide hazards [1][2]. Most smallholders were exposed to pesticides while in the field, during applying pesticides and also throughout harvest seasons. Lack of education and training programs from the relevant authorities were some of the causes which leads to many health problems among the farmers.

Therefore, this study was to determine the extent of the oil palm smallholders in Sandakan, Sabah on pesticides knowledge, how they handle the pesticide, how factors such as gender, age, education and duration of pesticide handling experience affects their daily practice. This study also tried to find ways to convey the information on the correct handling of pesticides to reduce negative effects of pesticides on humans and the environment.

### **II. Methodology**

Sandakan, a province located in the eastern part of Sabah was selected for the survey. The site was chosen because it is a major oil palm plantation area in Sabah. It is also due to lack of published studies on the knowledge, attitude and practice of pesticide use among oil palm smallholders in the area. The survey was constructed based on a published study in Cambodia [3].

There were four different parts in the questionnaire: part A is the respondent's background as knowledge and practice of farmers can be distinguished from these factors [4]. Part B is the respondents' knowledge of pesticides where respondents' basic knowledge is tested. Part C is on the respondents' pesticide practices: before, while handling and after handling the pesticides. Part D is the symptoms of pesticides poisoning experienced by respondents which were referenced from [3].

50 respondents of oil palm smallholders who are registered under the Department of Agriculture, Sandakan were chosen as according to [5] sample size. Apart from distributed questionnaires, field observation and in-depth interviews were also conducted. Scores method is used to determine the level of knowledge and good pesticide-handling practice applications by farmers as shows in Table 1. The statistical methods used in this study were the reliability test, descriptive and correlation analysis.

Table 1: The scores and level of knowledge, attitude and practices of respondents

MARKS SCORES	LEVEL
<50%	POOR
50% – 75%	MEDIUM
>75%	HIGH

### III. Results

Respondents' background consists of four categories; gender, age, education level and period of handling pesticides. There are 40 male respondents (80%) and 10 female respondents (20%) who use pesticides. Respondents' information is summarized in Table 2.

Table 2: The demographic factors of the respondents

Categories	Variable types	Number of people	Percentage (%)
<b>Gender</b>	Male	40	80
	Female	10	20
<b>Citizenship</b>	Malaysian	14	28
	Non Malaysian	36	72
<b>Ethnicity</b>	Bajau	1	2
	Kadazan/Dusun	8	16
	Bugis	14	28
	Malay	2	4
<b>Age ranges</b>	Others	25	50
	Below 20 years	3	6
	21 – 30 years	14	28
	31 – 40 years	22	44
	41 – 50 years	7	14
<b>Marital status</b>	51 years and above	4	8
	Single	12	24
	Married	37	74
<b>Education level</b>	Divorced	1	2
	No formal education	2	4
	Primary school	31	62
	Secondary school	14	28
	Vocational education	1	2
<b>Working status</b>	College / Universities	2	4
	Permanent work	26	52
	Temporary work(s)	13	26
<b>Experience</b>	Self employed	11	22
	Less than a year	3	6
	1 – 5 years	10	20
	6 – 10 years	25	50
<b>Income</b>	More than 10 years	12	24
	Less than RM 500	28	56
	RM 1000 – RM 2000	19	38
	RM 2000 and above	3	6

The majority of smallholders' knowledge is high (score more than 75%), they were aware of the effect of pesticides on the human and environment and they were handling the pesticides according to the recommended pesticide practices in Malaysia. The spearman correlation analysis shows a significant value in knowledge scores with demographic factors such as age and duration of use.

### IV. Discussion

As the farmer become older, their knowledge in pesticide handling also improved. Based on the interviews, it was found that the Agriculture Department in Sandakan has always observing and inspecting the smallholders practices from time to time. While visiting, they also disseminate information to smallholders and this has updated their knowledge on pesticide handling. Surprisingly for the new user, they also have higher

level of knowledge as based on the correlation analysis results in Table 3. A similar situation were observed by [6] in which shown farmers that have lesser experience in agriculture have a higher level of knowledge and acknowledged the fact that pesticides are dangerous and needs extra caution measures. This was because they relatively new to the agricultural activities and the level of enthusiasm in seeking new knowledge was very high.

**Table 3. Spearman Correlation between Knowledge Score and Respondent Demographic Factors**

		Gender	Age	Education level	Duration of using pesticide
Knowledge Scores	Corr. variables	-.011	.252*	.161	-.273*
	Sig.(1-tailed)	.471	.039	.133	.028
Practice Scores	Corr. variables	.056	.213	.155	-.389**
	Sig. (1-tailed)	.350	.069	.141	.003

\* Correlation is significant at 0.05 (*one-tailed*)

\*\* Correlation is significant at 0.01 (*one-tailed*)

Based on the questionnaires, a significant correlation were also obtained between knowledge and practice scores (corr. variables= 0.642;  $p < 0.01$ ) suggesting that the higher the oil palm smallholders knowledge about the use of pesticides, the better practice they adopted while using the pesticides.

Through observation some of the farmers didn't wear proper outfit while applying pesticide causing most of them experience exhaustion symptoms, suffered from lethargic, followed by itching of the skin and nausea and headache. All three of these symptoms experienced shortly after pesticide application. These symptoms were also recorded in [7] research where he stated that the majority of farmers who use pesticides have symptoms of poisoning on the skin such as itching of the skin, nausea, vomiting and headache immediately after doing it.

However the back pain that they experienced was not caused by exposure to pesticides, but more due to carry heavy pesticide sprayer and the repetitive movement they have to perform throughout the days. It is argued that farmers that experience exhaustion is not caused by excessive exposure to pesticides, but rather because of the area that needs pesticides spraying are too vast.

## V. Conclusion

It can be concluded the oil palm smallholders in Sandakan were taking good measures in their pesticide handling practices. Still, their daily routine can be improved to ensure safety and avoiding hazards to their work by reaching out to the smallholders consistently. There is a need to find ways to engage this group in supporting one of the pillars in the National Agricultural Policy that was to produce farmers that practice sustainable agricultural practices. Applying pesticides may be the short term solution in controlling pests and maximizing production but it is widely known how dangerous pesticides can be to the people and the environment in the long run. Further study need to investigate on the possible pesticide residue level from the farmer's body fluid.

## Acknowledgements

We would like to thank all subjects who volunteered to participate in this study. The authors declare that there is no conflict of interest.

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