Application Occupational Health

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Application of Occupational Health and Safety (K3) in Agrotourism

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Abstract

Agrotourism is a good alternative development on agricultu[27]ourism, and economy in Indonesia. The problem is the lack of attention from all of the human elements of the occupational health and safety (usually stated as K3 in Indonesia) in work activities and excursions. This research approach is carried out with qualitative and quantitative methods. The qualitative method was carried out by direct observation and interviews with agrotourism managers. Observations were made to determine the presence of risk factors in human activities in the agrotourism area. Quantitative method is done by giving questionnaires to users and managers of agrotourism to determine the application of K3 in agrotourism management. The conclusions of this research are: (a) aspects of health, safety and comfort of tourists in the area Agrotourism need to be created according to the characteristics and tourist activity in [21] area of agrotourism. (b) Health risk factors of farmers and worker of Agrotourism needs to be improved, (c) Application of health and safety (K3) Agrotourism in Indonesia still has not gone well and needs several applications such as: commitment as a government policy maker, area planning Agrotourism, K3 measurement, evaluation, and program management capacity of the K3.

Keywords
Agrotourism, Agriculture, Risk Factor, and K3 (Occupational Health and Safety).

1. Introduction

Agrotourism is part of tourism object used an agricultural firm as a tourism object. Its purpose is to wide knowledge, recreation experience, and link between agricultural firm. Through agricultural development that show the local culture in using the land, the income of farmer increasing simultaneously with the effort to conserve the land resources and caring the culture or local technology (indigenous knowledge) which in general already fit with its natural environment.

Basically, Agrotourism is unity between agriculture and tourism. On agricultural work has an injury risk, lungs diseases cause by heat expose of machine smoke, noisy, skin diseases, and cancer cause by chemical material such as pesticide. Likewise, on tourism agriculture (Agrotourism). On agricultural industry, include Agrotourism, work accident can happen because of using tools and agricultural machinery. The most general accident is tractor usage, such as tractor rolled, shiver, and noisy (NIOSH, 2020). Pesticide usage and other chemical material can cause the health disturbance, such as sex organ and anomaly child birth (NIOSH 2012, Asgar et al. 2016).

There are plenty of Agrotourism area in Indonesia, such as Agrotourism Ciweday, West Java, strawberry Agrotourism at Bedugul Bali, Apel Agrotourism at Malang, and other regions. The purpose of Agrotourism is to increase the foreign

exchange acceptability for country or income for regional itself (Niekerk 2013). Other purposes are save and care the existence and image of Indonesian agricultural product, as one of tourism product diversification, and then create a good entrepreneur condition to entrepreneurship in the field agriculture and tourism within management and services on Agrotourism. Besides that, there are Agrotourism firm, aim to a wide the knowledge, experience, recreation, and relation of firm in the field of agriculture. Through Agrotourism development which show the local culture for land use, can increase the income farmer, conserve the land resources, and care the culture or local technology, which in general already fit with natural environment condition (Sadowski and Wojcieszak 2019, Tseng et al.2019).

Farmer and Agrotourism worker have a unity work between agriculture firm and tourism firm. In Indonesia, informal sector of workplace farmer condition usually far from environmental health standard for farmer work, such as dirty and lack of knowledge for farmer about the health, causing the farmer become one of work has a high risk with disease. Various diseases threat the farmer health. Much those threat, such as: (a) Irrigation water derive from family waste, contain various pathogenic bacteria and nematode parasite, such as hookworm or an Ansyclostoma duodenale, which causing diarrhea or skin eruption and itch.

Ascaris worm also spread through the human feces, which also rise fever, (b) Insect, such as mosquito plenty exist in the rice field environment and can become a carrier agent of disease, such as malaria, DBD, or even cikunguya, (c) Approximately farmer has bad eat pattern and hand washing habit that is not common yet, become as a factor of farmer low nutrition quality, (d) low economic quality make unbalance between working time for farmer. All of these problems must be solved by farmer and unity with tourism aspect, in order to farmer area and production become an interested area for tourist, so need also to care about safety, comfortable and health for tourists who visit to those Agrotourism area.

This issue makes the farmer's work and Agrotourism worker become more complex and it can be their working time longer. Total working time for worker in agriculture sector in United States, show that 37% worker has work hour 48 hours per week, and 24% work more than 60 hours per week. Belief that the high work hours cause a high-risk accident. From all worker, 85% work out door more often than other sector, which only 25% (NIOSH2015).

From those problem above, need an observation and research about health aspect and work safety to Agrotourism farmer and observation on health and safety for tourist who visit Agrotourism area. The purpose of this research is to find out occupational health risk factors for farmers and workers in agrotourism areas, occupational health aspects related to the use of agrochemicals for agrotourism farmers, K3 aspects in agrotourism agriculture and the factors that must be considered in the occupational health and safety of farmers and workers in agrotourism, and aspects of safety and comfort of tourists in agrotourism areas.

2. Literature Review

2.1 Agrotourism

Agrotourism is a form of a series of tourism activities that utilize the potential of agriculture as a tourist attraction, both in the form of the potential for natural scenery of the agricultural area as well as the uniqueness and diversity of production activities and agricultural technology as well as the culture of the farming community. Agrotourism is also a form of creative economy in the agricultural sector that can provide added value to agribusiness in order to improve the welfare of farmers. Agrotourism can also be said as a combination of agriculture and tourism. Agrotourism is a specific form of rural tourism with close relation to nature and country side of rural areas and direct relationship to agricultural activities (Joshi and Bhujbal, 2012).

Agrotourism is also a form of tourism activity that utilizes agribusiness as a tourist attraction with the aim of expanding knowledge, experience, recreation and business relations in agriculture. While the tourist destination area is a place where all activities related to tourism can be held with the availability of attractions and tourist facilities for tourists (Suwena, 2010).

The aim of agro-tourism is to expand knowledge, recreational experience, and business relations in agriculture. Through the development of agro-tourism that emphasizes local culture in utilizing land, it is expected to increase farmers' income while preserving land resources, as well as maintaining local culture and technology (indigenous knowledge) which are generally in accordance with the conditions of their natural environment (Ministry of Agriculture 2005). Agrotourism is one of the businesses that gives a new image of agriculture related to diversification

and quality improvement that are unique. The emphasis on agro-tourism business is selling services in the form of areas or agricultural products that have a specific appeal to consumers. The quality of life of farmers can be improved by utilizing the agricultural resources they have through agro-tourism so that it can become a source of economic growth for farmer households.

2.2 Occupational Health and Safety (K3)

Occupational Health and Safety (K3) is a thought and effort to ensure the integrity and perfection of both physical and spiritual labor in particular and humans in general. In scientific discipline, Occupational Safety and Health is defined as "the science and its application technically and technologically to prevent the emergence of work accidents and occupational diseases from any work carried out". Occupational Health and Safety is "An effort to protect every worker and other people who enter the workplace always in a healthy and safe condition and the sources of the production process can be carried out safely, efficiently and productively" (HSP academy 2012). In terms of science and its application in an effort to prevent the possibility of accidents and occupational diseases. Occupational Safety and Health (K3) is a priority scale, because in its implementation, in addition to being based on laws and regulations, it is also based on certain sciences, especially engineering and medical science.

The objectives of occupational safety and health include:

a. Protecting workers' rights to safety in doing work for the welfare of life and increasing national production and productivity.
b. Ensure the safety of everyone in the workplace.
c. Production resources are maintained and used safely.

The Occupational Safety and Health Management System is part of the overall management system which includes the organizational structure of planning, responsibilities, implementation, process procedures and resources needed for the development of the achievement, assessment and maintenance of occupational safety and health policies in the context of controlling risks related to occupational safety and health. work activities in order to create a safe workplace (Ministry of Manpower 1996). The benefits of implementing an occupational health and safety management system include:

a. The management can find out the weaknesses of the operational system elements before operational disturbances, accidents, incidents and other losses arise.
b. A clear and complete picture of the company's OHS performance can be seen.
c. Can improve compliance with laws and regulations in the field of K3.
d. Can increase knowledge, skills and awareness about OHS, especially for employees involved in audit implementation.
e. Can increase work productivity.

3. Methods

This research approach is carried out with qualitative and quantitative methods. The qualitative method was carried out by direct observation and interviews with agrotourism managers. Observations were made to determine the presence of risk factors in human activities in the agrotourism area. Quantitative method is done by giving questionnaires to users and managers of agrotourism to determine the application of K3 in agrotourism management. The data was processed by qualitative descriptive method.

4. Data Collection

Data was collected using a questionnaire instrument, interview guide, and observation guide. Questionnaires were given to visitors and agrotourism managers. Interviews were also conducted with visitors and agrotourism managers. The results of the questionnaires and interview notes were then analyzed descriptively both quantitatively using descriptive explore and using qualitative analysis by comparing the results of the questionnaire with the results of interviews and observations.

5. Results and Discussion

5.1 Risk Factor on Work Health of Agrotourism Farmer

Combination of worker health quality concept as a primary capital to work with dangerous risk at their work environment. Generally Indonesian farmer do not need transportation to their workplace, but for gardening farmer, what more they live in the city which need long time direct to workplace, so quality and capacity of their work will decrease. Moreover, for farmer use a motorbike which always expose with air contamination and main road noisy, of course will rise heavy load.

To refer on work health theory, so farmer healthy risk at Agrotourism area were found at workplace, some of them are as follows:

a. Micro bacteria: risk factor which give a contribution to infectious disease incident, parasite, worm, and malaria. Worm and malaria diseases, beside as a threat for health, also as risk factor of rubber farmer worker, pepper gardening worker, and others. Various risk factor which accompany leptospirosis, insect bite, and poisonous animal.
b. Physical work environ factor: ultraviolet ray, heat temperature, cold temperature, weather, rain, wind, and others.
c. Human factor: fitting the tool with farmers physical condition, such as hoe, tractor, and other agricultural tools .
d. Toxin chemical material: Agri chemistry, such as fertilizer, herbicide, acaricide and pesticide.

5.2 Health Work Aspect Linked with Agri chemistry Usage For AgrotourismFarmer

Agri chemistry is one of main farmer health problem have a connection with their work. Agri chemistry include all synthetic chemical material were used for interest and wide need for agriculture production. Those material cover trigger growth hormone, fertilizer, pesticide, antibiotic and others.

The influence or effect of Agri chemistry used on work health depend on some issues, as follows:

a. Chemical material
b. Big or small dose
c. Method of application, how those Agri chemistry use in the field.

Pesticide was used because its toxicity to kill the pest. Its usage in the field has a danger potency on work health. Within doing an evaluation on work health aspect with pesticide, there are two issues which must be cared:

5.2.1. Toxicity, feature and characteristic of pesticide

Every sort of pesticide has a feature, characteristic, and toxicity different. So, it must be studied. Pesticide that exist in market in the package form consist of three chemical material components that are:

a. Active Ingredient (a.i)
b. Stabilizer
c. Dye, smell, solvent, and other.

That chemical material each has a danger potency on health. However, its toxicity is calculated on active ingredient. While all those three chemical materials, have a potential complementary one each other to form new toxicity. Pathophysiological impact on pesticide poisoned depend on the feature of that pesticide. For example, group organochlorine can disturb the central nervous system and peripheral function through the cholinesterase bond

5.2.2. Usage Aspect

All aspect which linked with usage and human aspect as worker himself, such as, education, skill, behavior, age, plantation high, protective cloth and others. Some issues which must be cared, those are:

a. Self-protection tools
   One thing which is often forgotten by farmer on pesticide usage is the poison contact. So that the route of entry through skin is very effective. Moreover, if there are skin defect abnormally or with sweat together, absorption

by skin more effective. Generally, farmer less know about it, they usually like to use masker and naked breast, compare with cover himself with protective cloth.

b. Factors that influence behavioral exposure
If someone work spraying pesticide in the field, so the total pesticide contact to the body will be influenced by:
1) Plant high
2) Age
3) Experience
4) Education and skill
5) Wind direction and speed
While the critical phase within Agri chemistry usage, like pesticide what must be care, such as:
1) Mixing
2) Spraying used protective cloth
3) After spraying

5.3 K3 Aspect of Agrotourism and its development

K3 application in agriculture field and tourism industries are not optimal yet, many elements do not apply K3 well, such as government policy, farmer themselves, guide tour, and tourists do not care of K3 aspect in their activity. There are some strategic methods next about health construction and farmers work safety which as a job of stakeholder, moreover they rely on agriculture and tourism as a source of their income and regional original income. Some agriculture and tourism areas development is an Agrotourism, such as Agrotourism Ciwedey in West Java, Turi Agrotourism Jogjakarta, Agrotourism Temanggung, Central Java, Agrotourism area in Batu, East Java, Agrotourism Bedugul Bali, Agrotourism Sinoa Sulawesi, and Agrotourism Banjar baru Kalimantan

Some Agrotourism area in Bali, such as at Bedugul-Tabanan area, Petang-Badung, Sidemen-Karangasem, and others.

a. Commit on Agrotourism Farmer Health Quality
The government must have enough commit on Farmer health and safety work, include Agrotourism farmer and diseases that linked with that farmer work. Commit on farmer health problem is very important to support local or regional economics. In respect of farmer problem need to be risen to build this commit. For example, is basic sanitation for poor population household, farmer as an informal sector must be considered as a regional investment to support the investment economics

b. Agrotourism Area Planning
K3 planning at Agrotourism area include such as;
1) K3 target must clear
2) Risk control
3) Law and legislation, regulation and standard must fit
K3 Application to Agrotourism farmer, worker and tourist, include
1) Health services & work safety in general
2) Counseling about health and disease cause by work linked with farmer work and worker
Work Health Effort (WHE) give a counseling such as how to use pesticide safety, how to use a dangerous chemical material correctly, so are not danger for farmer themselves and environment. Also prevent effort and treatment for diseases linked with Agrotourism farmer work
Health and work safety problem not only interest on risk factor which exist on their work, but also covered health level as an initial capital to work. So clean water supply program, healthy housing also supports health level and farmer prosperity.

c. K3 measurement and evaluation on Agrotourism field
Measurement and evaluation cover farmer and worker Agrotourism health checkup, mainly who expose problem Agri chemistry or pesticide and check them, whether do happen the body anatomic change cause by work ergonomic factor ignore. K3 evaluation to farmer, worker and Agrotourism tourist also need to be done.

5.4. K3 Program management capacity on Agrotourism industries

To build an Agrotourism farmer/worker productivity and health quality is needed capability or capacity for program management. Government capability to manage the worker on Agrotourism need to involve the capability of professional experts, such as medical doctor, nurses and public health executive. For that problem, training and

understanding on health problems as an initial capital or healthy which in connection to the work must be managed precisely.

From the side of agriculture and tourism need, education and training must be done in order to transfer of technology to face the competition for the sake of sustainable tourism form. Sustainable tourism success is very determined by local people education step. So that access and education quality for local people become a target and purpose are very prime (Idris et al. 2012, UNESCO 2019).

Sustainable development become a strong theme and controversial. Strong because nearly all the countries over the world agree with this theme, controversial because this theme as if become a rhetoric merely for progress countries. Sustainable development can be achieved only when social and environ impacts balance with economic aim were expected (Mensah 2019, Younis and Chaudhary 2020). In the tourism, there is no impact (zero impact) as a consequence of tourist minimum level achievement from negative impact need to be planned. Management approach for sustainable tourism as part of sustainable development, must be based on global principle too from sustainable development. All activities to manage one destination area must consider (form) part of sustainable development value

To support an agroindustry work system plan process so that yield a sustainable industrial system, is needed one study on real work condition, mainly which connected with work load which will be accepted by operator or human (Talaviya et al. 2020, Tonelli et al. 2013).

5.5 Safety and Comfortable Aspects of Tourist at Agrotourism

Need to created safety and comfortable aspects at Agrotourism area, good for worker, such as farmer and labor or the tourist who come. Many problems that must be cared to support the safety and comfortable aspect of agrotourism area are tourist facilities and activities. In General, Agrotourism has not a standard yet which can be used as base to build the tourist need. But, in some issues, facilities planning can refer to the need of visitor, ready and based on visitor services which were fitted with the facilities available.

Public area comfortable, include agriculture must be cared. Increasing comfortable can be done by making a plan or intervention from the facilities which exist already (Human Ergology Society 2017, Pitt and Shew 2017). Facilities that fulfill services at Agrotourism area need to pay attention on characteristic, such as:

a. Tourist characteristics
   From the sort of tourist side, can be divided to be domestic tourist and worldwide tourist. Domestic tourist activities pattern has a work: (1) tour with family, (2) tour in group, (3) tour with bring food themselves, (4) tour with their vehicle.
b. Visitor Agrotourism activities
   Visitor agrotourism activities pattern are very variations, and have a specialty depend on the kind of location and characteristic of that agrotourism itself. Visitor activities with range of hills agrotourism character can unity various activity, such as; 1) Feeling the photographic view, 2) Walk around, jogging, ride a bike, 3) Recreation play with family, 4) Pick fruits and vegetable, feeling the beautiful of flower garden, 5) to sow seeds, 6) camp, 7) outbound activities, 8) observe flora location, 9) to buy Agrotourism product.
   While visitor activities within low land can combine various activities: 1) Feeling the view, 2) walk around, jogging, bike, 3) camp, 4) horse riding, 5) observe the flora location, 7) Family recreation with children play group, 8) Walk around area with special vehicle, 9) To plant and buy agriculture seed commodity, 10) Outbound activities, 11) Photography, 12) Feeling Agrotourism product.
c. The facilities that need to be existed within Agrotourism location
   To create a safety and comfortable at Agrotourism area, need a facilities as follows; 1) Enter door, 2) Park area in location, 3) Security post, 4) Rubbish box, 5) Mosque/Musholla, 6) Bath room/toilet, 7) Restaurant, 8) Telephone kiosk, 9) Shelter, 10) Souvenir shop, 11) Information center, 12) Round Vehicle , 13) Small road, 14) Entertainment stage, 15) Viewer desk, 16) Observer stage, 17) Seeing sentry post, 18) Road in location to transportation surround the location, 19) Brochure/guide book, 20) Direction manual, 21) Park area at plaza, 22) Botanical museum, 23) Library, 24) Arcade shopping, 25) Ticket windows, 26) Out and In door for tour guide, 27) Security, first aid post, ambulance, 28) Auditorium for running a film, 29 Executive office

There is needed an intervention to prevent or decrease the work accident on Agrotourism, both for farmer/worker or tourists. For example, intervention on agriculture which modify the tractor become ergonomic tractor, so the farmer can use more optimal with productivity better (Benos et al. 2020). Modify the agricultural tools can increase the farmer

productivity (Abdullahi et al. 2015, Yusuf et al. 2016). To reduce risk and increase productivity in agriculture, it is necessary to design agricultural tools and ergonomic farming methods (Kroemer and Grandjean 2009, Patel 2017).

6. Conclusion

Some issues can be concluded such as follows:

a. Work Health risk factors for farmer and worker on Agrotourism, such as microbe, (give contribution to infectious disease, parasite, worm, and malaria) incidence, Physical work environment (such as ultraviolet ray, heat temperature, cold temperature, weather, rain, wind), capacity and capability (fitting the tool with farmer physical condition, such as hoe, tractor and other agricultural tools), agrochemistry toxin of chemical material (such as fertilizer, herbicide, acaricide and pesticide)
b. Impact of Agri chemistry usage aspect on work health depend on the chemical material, dose and application method of those material. Some problems need to be cared in Agri chemistry usage, such as pesticide is toxicity, character, feature, using aspect. Within usage the worker need to use a self-protection tool and pay attention to behavioral exposure.
c. K3 application within Agrotourism agriculture do not run well. So K3 aspect which must be applied cover some issues, that are government commitment as a policy maker, Agrotourism area planning, K3 measurement, evaluation, and management of K3 program capacity.
d. Tourist Safety and comfortable aspect in Agrotourism area need to create. Something that must be cared on safety and comfortable are the facilities that exist, manual such as marks, brochure, guide books and so on, and also guide executive on agrotourism area. Those problems must care of tourist characteristic and tourist activities in Agrotourism area.

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