



ISSN 2373-423X

JOAAT

Journal of Advanced Agricultural Technologies



Vol. 4, No. 1, March 2017

[www.joaat.com](http://www.joaat.com)



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# Journal of Advanced Agricultural Technologies

## CONTENTS

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### Volume 4, Number 1, March 2017

#### Agricultural Production & Environment

- Change of *Lactobacillus* in Cabbage and Radish Caused by the Change of Soil: Quality Hindrance of Kimchi and the Solution to It ..... 1

*Alberta Yoo*

- Sugar Production Potentials of Some Sweet Sorghum Hybrids Cultivated in Heavy Metals Polluted Soil ..... 12

*Teodor Vintilă, Adrian N. Trulea, Nicolae Popa, Daniela Vintila, and Georgeta Pop*

- Evaluation of Yield Components on *Capsicum* spp. under Two Production Systems..... 18

*Sorapong Benchasri, Sakunkan Simla, and Sirikan Pankaew*

- Chemistry and Microstructure of Surface Peat Soils: Implications of Pineapple Cultivation.....23

*Nur Qursyna Boll Kassim and Adzmi Yaacob*

- Residual Effect of Biochar on Growth and Yield of Red Chili (*Capsicum Annum* L.) .....28

*Erwin I. Wisnubroto, Wani H. Utomo, and Eko R. Indrayatie*

- Global Warming and Maize.....32

*Gül Ebru Orhun*

- The Effect of Zinc and Humic Acid Applications on Yield and Yield Components of Sunflower in Drought Stress.....36

*Hamid Hatami*

#### Agricultural Management and Assessment

- Food Traceability and Safety: From Farm to Fork – A Case Study of Pesticide Traceability in Grapes.....40

*Dineshkumar Singh, Srinivasan Karthik, Siddhesh Nar, and Divya Piplani*

- The Variation of Indigenous Upland Rice Landraces in Ratchaburi, Thailand Based on Seed Morphology and DNA Sequencing.....48

*Prin Phunngam, Nichakorn Pathumrangsri, Natnaree Khambai, Jarawan Tongjun, and Uraivan*

*Aranyawat*

- Characterization of Essential Oils from Tuberose Flowers Waste (*Polianthes tuberosa* L.) .....53

*Arita D. Nugrahini, Aisyah L. Ristanti, and Jumeri*

- Effect of Chemical and Mechanical Weed Control on Cassava Yield, Soil Quality and Erosion under Cassava Cropping System .....57

*Titiek Islami, Erwin I. Wisnubroto, and Wani H. Utomo*

- Agronomic Evaluation of Mechanical and Chemical Weed Management for Reducing Use of Herbicides in Single vs. Twin-Row Sugar Beet.....62

*Meisam Zargar, Elena Pakina, and Petr Dokladin*

Empowerment Agent through Islamic Value in Preventing Palm Oil Plantation Fires Based on Public Participation.....	68
--	----

*Akbarizan, Fitra Lestari, Hisbun Nazar, Sri Murhayati, and Mawardi*

#### **Animal Biochemistry**

Chemical Composition and Antioxidant Activities of Catfish Epidermal Mucus .....	73
--	----

*Nurul Mariam Hussin, Sharifudin Md. Shaarani, Mohd Rosni Sulaiman, Abdul Hamid Ahmad, and Charles S. Vairappan*

#### **Food Science and Engineering**

Effect of Freeze Dried Protein Hydrolysate from Yellowstripe Scad ( <i>Selaroides Leptolepis</i> ) in Reducing Oil Uptake in Fried Seafood Product.....	78
---	----

*Hau Eng Huan, Mohamad Khairi Zainol, and Zamzahaila Mohd Zin*

Evaluation of Buckwheat ( <i>Fagopyrum esculentum</i> ) Intrinsic Phytase Activity to Improve Phosphorus Availability in Broilers .....	82
---	----

*Rakhi Chowdhury, Mustanur Rahman, and Katsuki Koh*

Yield of Carotenoids, Phenolic Compounds and Antioxidant Capacity of Extracts from Gac Peel as Affected by Different Solvents and Extraction Conditions.....	87
--	----

*Hoang V. Chuyen, Xuan T. Tran, Minh H. Nguyen, Paul D. Roach, Sophie E. Parks, and John B. Golding*

#### **Agricultural Biotechnology**

Mass Propagation of <i>Lagenaria siceraria</i> through <i>in Vitro</i> Culture.....	92
---	----

*Nor A. Hasbullah, Mohammad M. Lassim, Muhammad A. Mazlan, Siti Z. Lood, and Muhamad A. Mohamed Amin*

# Empowerment Agent through Islamic Value in Preventing Palm Oil Plantation Fires Based on Public Participation

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**Abstract**—Palm oil plantation provides a positive impact on improving standards of living in the community and also potential for growth Indonesian economies. Nevertheless, there is the high level of smoke pollution that are caused by many hot spots in the palm oil plantation area during the dry season every year. The objective of this study to empower the community by providing the empowerment agent with adopting Islamic value to prevent palm oil plantation fires through public participant. To obtain a better understanding of public participation, the research analysed the study through informal discussions in qualitative research. Then, it is transformed into a technique that represented the many activities using data flow diagrams. The result revealed that reinforcement of the empowerment agent to prevent palm oil plantation fires is done through religion institutional such as mosques. Future research suggested conducting simulation modelling technique in order to evaluate the performance of empowerment agent in reducing smoke pollution in palm oil plantation fires through several performance attributes.

**Index Terms**—palm oil plantation, fire, data flow diagram, public participation, empowerment agent

## I. INTRODUCTION

Riau is a province with the largest palm oil plantation area in Indonesia [1]. This provides a positive impact on improving standards of living in the community and also potential to growth Indonesian economies. Nevertheless, there are also many problems that arise because of the existence of the oil palm plantations. Saragih and Bonda [2] reported that Riau Province had 859 hot spots in the palm oil plantation area which it was the highest hot spots in Indonesia that caused smoke pollution during the dry season. This had a negative impact to the community not only in the Riau Province but also others neighboring provinces. Thus, it has become a national issue for the Indonesian government to be resolved.

Palm oil plantation fires in Riau are caused by multiple factors. One of them lack of the monitoring of palm oil plantation which has not been optimized. Furthermore, ownership of palm oil plantations in Riau consists of

belonging to community, private and public industry. Especially for public and private ownership, they have methods and tools with a high level of security for the prevention of palm oil plantation fires. However, for ownership by the community, the fire prevention still has not been the focus in handling due to limited on funds and knowledge. Thus, many problems arise because of there are many hot spots in palm oil plantation caused by the community ownership. In addition, it is also caused dry land during the dry season and the level of strong gusts of wind [3]. Thus, it facilitate and accelerate the fire to spread to several locations.

Issues of palm oil plantation fires require public participation to jointly cope with this disaster. Community who living in this area should has the special attention about the issue of smog that appears in the dry season. Thus, it is necessary to empower the public in order to stimulate their responsibility for environmental sustainability not only their palm oil plantation but also surrounding their residence. Community Empowerment is the responsibility of government to provide education and skills to maintain and control palm oil plantation area. Government able to cooperate and collaboration with private sector and other stakeholders to solve this issue.

This research aims to empower the community by providing the empowerment agent based on Islamic value to prevent palm oil plantation fires. Empowerment agents are in the form of public participant which they are managed under the control of government in providing education in monitoring on palm oil plantation fires. Furthermore, the empirical study was conducted and implemented in a village in Kandis districts at Riau Province, Indonesia.

## II. PUBLIC PARTICIPATION

There are many researchers who study public participation approach to solving environmental issues. Irvin and Stansbury [4] revealed that increasing public participation in government decision making on environmental issues produce many important benefits. Their study analyses key considerations in determining

whether public participation is an effective policy-making tool. The result showed that there were positive outcomes for citizens joining the policy process, collaborating with others, and reaching consensus to bring about positive social and environmental change. Furthermore, public participant needs to evaluate in order to determine how the effective community empowerment program. Charnley and Engelbert [5] used mail surveys as an effective and economical tool for obtaining feedback on Environmental Protection Agency (EPA) on community empowerment program. They concluded that systematic evaluation provides meaningful and useful information that agencies can use to improve their public participation programs.

This study proposed to adopt the public participation with implementing Islamic values in community empowerment. This approach includes five principles of community empowerment [6]:

1. Humans are treated fairly and openly as a manifestation of the capabilities and potentials.
2. Community empowerment is not seen as a process of giving of the party that has something to those who do not have.
3. A process of learning to be independent in the improvement of quality of life.
4. Participation is not only the presence but also contribute to a program of community empowerment.
5. Community involvement despite having no power or adequate provisions.

Moreover, they believe that the key to success of this principle is integration between the material and spiritual dimensions of social life. In addition, Matthoriq [7] adopted Islamic values to the empowerment of seaboard community which the case study done in Indonesia. They revealed that community empowerment showed that the actualization of the Islamic values can strengthen the social character within the scope of social life because it consist of individuals and families that has a high spiritual quality in frame working of empowering agents. Moreover, their study also suggested the empowerment agent become the role model by equipping the individual capacity sufficient to have specialized expertise in various sectors in the community.

### III. METHODOLOGY

This research adopted public participation approach to fulfil gap of study. Furthermore, Participatory Action Research (PAR) method was selected to obtain further understanding and consideration on preventing palm oil plantation fires based on public participation. Therefore, PAR concerns to conduct the case which involves the whole stakeholders and their experience to propose improvements in the system. Using PAR, it was useful to collect information based on an individual's feelings, views, and patterns that are revealed without manipulation from the researcher [8]. In addition, the role of PAR examined focus group discussion and interviews as methods for data collection because it focused on practical research considerations regarding the role and tasks of the

various participants; specific methodological approaches; and quality criteria in the sense of arguments justifying a participatory approach [9]. Thus, The participant involved in making informed decisions throughout all aspects of the research process for achieving the ultimate goal of the study.

Moreover, to generalize the finding on preventing palm oil plantation fires based on public participation, the study needs perspectives from public participation who can share their individual experiences through social interaction with the human community [10]. In addition, this study required existing records and observed the phenomenon to analyse what is happening in a given situation. Thus, to obtain a better understanding of public participation, the research analysed the study through informal discussions using in-depth interviews. Understanding people's meaning is an investigation of qualitative research. According to Yin [11] qualitative research was a strategy of inquiry explores a program, event, activity and process in-depth within the real life.

Validating the research was done through selecting the sample size of the study. Thus, this study designs the sample with choosing the number of cases in public participation using single case study research. Voss *et al.* [12] revealed that single case study greater depth of observation. However, it limits on the generalizability of the conclusions drawn because it biases such as misjudging the representativeness of a single event.

Result of qualitative research was transformed and described into activities which it represented the relationship between entities in the case. Hariyati *et al.* [13] employed qualitative research in developing prototypes of the nursing management information system using Data Flow Diagram (DFD). This technique illustrates how data are processed by a system in terms of inputs and outputs. Obviously, DFD is believed to elaborate event or activities within a system and compatible for qualitative research in order to explore the current situation and incremental study.

This study adopted technique in Data Flow Diagram (DFD) to describe several activities of empowering agents in preventing palm oil plantation fires. Most of studies employed DFD to describe collaboration among entities including transfers data and information that was occurring. Ibrahim and Yen [14] revealed that DFD was an approach for specifying, constructing and visualizing the model of a system graphically and has been in practical use on a very wide basis. Furthermore, Alkazemi *et al.* [15] reported on their experience of using DFD. It was able to improve project management by dividing the work into clear-cut segments between members of the group and also enable to guide participants' projects in order to identify the amount of work done and by whom.

### IV. CASE STUDY

The study was conducted in a village in Riau which the ownership of palm oil plantation included the community and industry. Especially for the community, they had limited area palm oil plantation approximately 5-10

hectare. To manage the village, the community elected a former manager of palm oil plantation to be village chief.

There were Muslim people stayed in the village. To fulfil spiritual activities, the government and private organization build many mosques. Moreover, mosques were religion institutional in the community.

Obviously, there were several entities that involved conducting the environmental crisis in the case of palm oil plantation fires. They were community, industry of palm oil plantations and government that represented by the village chief.

## V. RESULT

This study elaborated the principle of community empowerment through Islamic value to educate the agents in order to control and maintain palm oil plantation. There were five stages of community empowerment that was adopted for empowering agent involving focus group discussion, training, monitoring, evaluation and action. In practice, reinforcement of empowerment agent is religion institutional such as mosques. Furthermore, government and industry collaborate for empowering agent in mosques in order to invite the community in sharing knowledge and skill. Fig. 1 represents stages of the community empowerment based relationship between entities into flow activities of empowerment to prevent environmental crises such as palm oil plantation fires.

Public participation in disaster prevention was needed to avoid the environmental crisis in Riau Province. In this study, public participation adopted Islamic value and used religion intuitional such as mosques for empowering agent in order to prevent palm oil plantation fires. It can be applied with the integration of technology, methods, materials, funds and social behaviours derived from stakeholder information includes: government, industry and community [16]. Then, the overall information was transferred into training modules for agents in community empowerment.

facilitate the stakeholders in preparation of empowerment activities for the preservation of the environment and establish a mental and spiritual endurance for empowering agent who has been designated. Moreover, the government done monitoring program to make sure the empowering agent running as well as its function. Finally, there were reward and punishment for the agents who support the government programs

### B. Industry

Private sector through Corporate Social Responsibility (CSR) helped empower communities in the maintenance of palm oil plantation by giving them the knowledge and skills to prevent environmental damage. They become facilitators who transfer the technology and method from industrial experience for the agents in preventing palm oil plantation fires.

### C. Community

This entity is the object of empowerment at the same time as agents who responsible for the maintenance of palm oil plantation in the working area that has been set. The empowerment agents collected data of land ownership, weather and potential fires in the village. Then, they produced reports to the government.

More detail, relationship between government, industry and community to educate the agents was transformed into a Data Flow Diagram (DFD) which consists of tools such as terminator, process, data flow and data store. This study was supported by the software of *CASE studio* to describe data flow diagram model. Fig. 2 describes the detail process community empowerment based on public participation using data flow diagrams.

## VI. DISCUSSION

Prevention of palm oil plantation fires in this study utilized mosques as a centre of empowerment agent. Generally, mosque is a place of religion institutional used by the Muslim community. Nevertheless, this study proposed the mosque to be an instrument of empowerment in improving the quality of people's lives. Ahmad Dahalan *et al.* [17] reported that the function of the mosque is holistic to create an empowered and independent community whenever it integrated with basic of science and technology. Thus, to realize it, the mosque must be supported by good management in order to maintain the environmental issues.

Moreover, the Mufidah [18] revealed that the mosque was able to use for collecting and mobilizing the community in various fields because the mosque serve as facilitator, catalyst and mediator in empowering of community life. Muslim *et al.* [19] also reported that mosque used to collect social fund for activity of community because it was able sharing information and facilitate communication between stakeholders. Indeed, it showed that the mosque was able to educate and organize the empowering agent in order to prevent palm oil plantation fires which it reduce quality of community life.

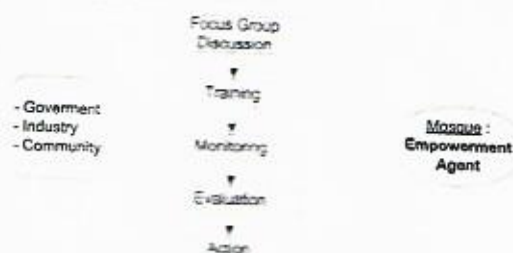


Figure 1. Stage of empowerment agent

Analysis the relationship between entities in this study as follows:

### A. Government

This entity serves to help in community empowerment through government programs such as providers of funds,

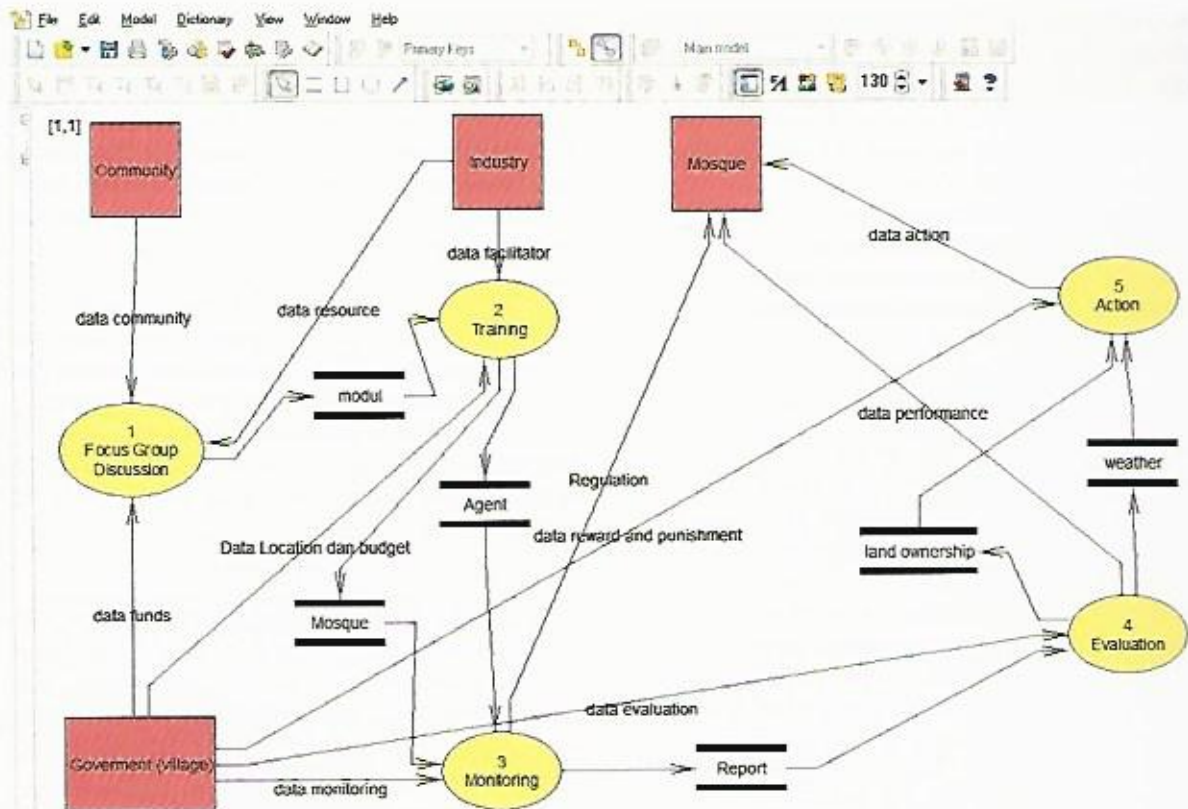


Figure 2. Community empowerment using data flow diagrams in CASE studio software

This study analyzed the collaboration between stakeholders for empowering the agent adopting Islamic value. This perspective was used through public participation in supporting the strategic planning process of government programs in prevention palm oil plantation fire in Riau, Indonesia. This is a program of social and economic equity between communities and nations to find a way to equitably distribute sense of security and increase prosperity for all. In other word, community empowerment meets the needs of the present without compromising the ability of future generations to meet their own needs [20].

## VII. CONCLUSION

This study proposed a model to provide the empowerment agent through community empowerment to prevent palm oil plantation fires. Sustainably of environment is the responsibility of government, community and industry in order cooperate and maintains the social life. This study implemented the public participation in a village with adopting Islamic value. The result cannot generalize to another area because it must consider the culture and behaviour of community within an area. Future research suggested conducting simulation technique in order to evaluate the performance of empowerment agent in reducing smoke pollution in palm oil plantation fires through several performance attributes.

## ACKNOWLEDGMENT

The authors thank to Ministry of Religious Affairs Republic of Indonesia and Sultan Syarif Kasim State Islamic University who sponsored this research.

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