

**RESILIENCE OF FARMING LABOURS BASED ON BAWON SYSTEM
TRADITION AND ANI-ANI TRADITIONAL APPLIANCE
IN INDIGENOUS COMMUNITY OF URUG SOCIETIES
IN BOGOR, WEST JAVA**

**KETANGGUHAN BURUH PERTANIAN BERBASIS TRADISI BAWON DAN
PERALATAN TRADITIONAL ANI-ANI PADA MASYARAKAT ADAT URUG BOGOR
JAWA BARAT**

**(1)Bahagia*

Universitas Ibn Khaldun Bogor dan Researcher at LPM Equator

(2)Rimun Wibowo

STIMMA IMMI Jakarta and The Chairman of LPM Equator Bogor

(3)Fachruddin Majeri Mangunjaya

Postgraduate School Universitas Nasional Jakarta

(4)M.Azhar Al-Wahid

Universitas Ibn Khaldun Bogor and Reseacher at LPM Equator Bogor

Submitted: 16-08-2020; Revised:29-09- 2020; Accepted:29-09-2020

ABSTRAK

Maraknya pertanian industri telah mengubah sistem dan peralatan pertanian tradisional secara tak terelakkan. Terhadap tren tersebut, masyarakat adat Urug di Bogor Jawa Barat tetap mempertahankan sistem bawon dan budidaya lahan serta pemanfaatan Ani-Ani sebagai alat utama untuk panen padi. Tujuan penelitian ini adalah untuk mengetahui peran praktik pertanian tradisional dalam pemberdayaan dan ketahanan masyarakat buruh tani. Makalah ini didasarkan pada pendekatan kualitatif etnografi di desa masyarakat Urug dimana penulis melakukan wawancara mendalam dengan komunitas buruh tani, observasi dan dokumentasi. Hasil penelitian menunjukkan bahwa sistem bawon merupakan tradisi dalam bercocok tanam yang membantu masyarakat yang tidak memiliki lahan untuk bercocok tanam. Praktik tradisional tersebut menciptakan ketahanan di kalangan pekerja pertanian karena para buruh tani dapat memenuhi kebutuhan dasarnya melalui mekanisme ini sebagai alternatif dari teknologi pertanian modern yang tidak terjangkau. Penggunaan alat tradisional seperti ani-ani sangat penting dalam pemberdayaan wanita karena memberikan peluang bagi wanita pada aktivitas pertanian.

Kata Kunci: *Ani-ani; Bawon; Ketahanan Komunitas; Iklim; Pengetahuan Indigenous.*

*Corresponding author: bahagia@uika-bogor.ac.id.

Copyright©2020 THE AUTHOR (S). This article is distributed under a Creative Commons Attribution-Share Alike 4.0 International license. Jurnal Kawistara is published by the Graduate School of Universitas Gadjah Mada.

ABSTRACT

The purpose of this research is to investigate *bawon* system tradition and traditional appliance in the traditional community to empower farming labours toward community resilience. The research method used is an ethnographic qualitative approach. This method is applied because the research is related to cultural, ritual, traditional, and social phenomena. The data are collected through in-depth interview, observation, and documentation. The selection of informants as samples uses purposive sampling technique. The result is probed meticulously through technique triangulation and source triangulation. The result shows that *bawon* system is a tradition in agriculture to assist landless people for cultivating. It leads to create agriculture worker resilience because the landless people can fulfil their basic needs from this mechanism, and they will not be unemployed amid the implementation of modern agricultural technology. Another result is the use of a traditional tool like *ani-ani* which can empower women resilience because women will not lose their vanity in farming activity. Besides, it can attain tradition and cultural resilience because *ani-ani* and *bawon* system can be categorized as traditional culture.

Keywords: *Ani-ani; Bawon; Climate; Community resilience; Indigenous knowledge.*

INTRODUCTION

The state of art in agriculture has impacted on numerous obstacles including the alteration of traditional agriculture to a modern one, which leads to some issues including a limited number of jobs for agriculture labours who cannot adapt themselves such as to become tractor operators. Driving tractor requires skill, while agricultural workers who lack knowledge and skills will lose their job opportunities. It will be followed by the vanishing vacant jobs for the owners of manual ploughing. Meanwhile, it can distribute income to the owners of the land and the people who have skills (Rifkian et al., 2017). In addition to it, mechanisation can jump unemployed women in the rural area (Suaib, 2018). The reason is that the transformation from traditional agriculture such as the use of *ani-ani* as the traditional equipment for

harvesting rice plants must be changed to mechanisation, while this conversion requires more skilled manpower.

The impact is that women energy in agriculture is overlooked (Karningsih, 2014). Besides, it can be compounded by reducing of agriculture labour subsistences because of the application of mechanisation for harvesting paddy (Yuliawati, 2019). Directly, a cultural tradition like *gotong royong* (communal work) can be vanished because modernisation needs a more shortage of people, while activities in agriculture are carried out by a collective action, both cultivating and land ploughing as well as harvesting (Masihin et al., 2015). Besides agriculture, technology can be worthy for numerous people including people who work in *bawon* system, the farming workers who are landless, and shepherds.

Among Baduy people, indigenous knowledge or local knowledge is developed through a continuous process that also includes spiritual and cultural elements of knowledge holders, apart from multigenerational observations and skills. These aspects are more localised and specific to certain communities based on their social, economic, and cultural needs (Hosen, Nakamura & Hamzah, 2020). Indigenous knowledge has a connection to social-ecological knowledge because indigenous knowledge may be able to conserve the ecological environment through cultural and social policies. Local knowledge (LK) generally refers to knowledge systems embedded in the cultural tradition of regional, indigenous, or local communities. Traditional knowledge includes types of knowledge about traditional technologies of subsistence (e.g. tools and techniques for hunting or agriculture), midwifery, ethnobotany and ecological knowledge, celestial navigation, ethnoastronomy, and other useful skills and pieces of knowledge in that particular environment (Godfrey & Siraje, 2019).

While the social and ecological system can be defined as a connection between the human system and nature or environment to bolster resilience, resilience may be men-

tioned as the capacity of a human to respond by adapting, self-organising, and learning (Folke, 2016); even dealing with stressors and efficiently resuming the rhythms of daily life through cooperation following shocks (Aldrich & Meyer, 2015). Then, resilience includes the capacity of systems (nature and human) to cope with responding or reorganizing hazardous events, so that structure, function, and identity are maintained, while capacity for adaptation, transformation, and learning is also maintained (Field et al., 2014 in Scarano, 2017). Ecological and social resilience are thus dynamically interconnected through evolving forms of natural resource management and subsequent response of biophysical systems. Besides, people and their knowledge have been engaged in environmental monitoring through a variety of participatory arrangements (Thompson et al., 2020).

Lastly, resilience can be identified by the capacity of the social system toward an external change. The strength capacity can adapt to alteration and be converted to a new system of social which later must be refined. Conversely, when the social of capacity is categorized as low capacity, it can be vulnerable to go down (Suradisastra & Priyanto, 2011). Indigenous knowledge in traditional people has faced life perturbances like climate, environmental change as well as modernisation of agriculture, including converting traditional agriculture equipment to modern farming. It can lead to a change in a social system, culture, and behaviour in agriculture. However, traditional people withstand to confront this debacle because they have adapted and have had persistence principle to conserve and apply a traditional system to combat these issues. There is a heavy connection between socio-ecological resilience and traditional knowledge as well as tradition. When traditional people preserve traditional tools, merits can be produced for the environment because traditional appliance does not use fossil fuel. The impact is that it can contribute to decreasing emission, which is the major factor to create global warming.

Traditionally, people use to protect *ani-ani*, meaning that they salvage our atmosphere; even protecting culture and tradition as well as social binding when traditional people conserve this action. *Ani-ani* is a cultural value which people have responded to protect from vanishing. To safeguard *ani-ani* is similar to safety women workers in farming because *ani-ani* is implied by women. If *ani-ani* is no longer to be implemented, typically unemployed women in village occur. Indigenous people in Indonesia, such as Ciptagelar community, have conserved traditional technology in agriculture including *item (ani-ani)*/traditional tool for harvesting rice. After that, the paddy yield will be stored in *leuit* or traditional storage for paddy (Aini & Syafi' 2019). It is similar to protect *bawon system* from extinction. *Bawon* can be uttered as tradition or habit heredity from the forefathers. The principle is no treaty for determining paddy yield as a wage because people have already comprehended about it, and due to the fact that people have conducted this tradition for a long period of time (Wulandari, 2019).

Bawon is also defined as the owner of land opening vacancy for work to everyone to get blended in collecting paddy yield in the land of the owner and obtain paddy as reward or wage (Abdurrahim et al., 2014). However, *bawon* system can also be implemented in another activity, such as people who do not have tractor or machine, these people can rent a tractor to other people, but they must pay it with *bawon* system (Masihin et al., 2015). Generally in *bawon* system, women are involved because a great number of activities in farming are conducted by women. As *bawon* alters to modern system with wielded harvester mechanization, the women might lose their jobs. In Samin community, *bawon* system is the way to assist other people (harvester of paddy) through paddy outcome because the landowner has chores to empower agriculture workers through paddy yield (Jumari, 2012).

In another location, the application of *bawon* is known as *magersari* or *mbawon* or

pesanggem, people admit to cultivate in forestry land such as a teak forest with numerous sorts of plant and obtain a yield of plants from their work, but they must keep the teak trees from damage and nurture of trees (Munawaroh et al., 2015). This research will not highlight the previous research but will investigate another traditional community in Bogor, West Java, namely Urug people. There are two main points that will be traced including how *bawon* system in the tradition of Urug people can be mentioned as empowerment for agriculture workers in creating community resilience. Besides, the aim of this research is to identify the merits of *bawon* in agriculture for labours in farming. The other which will be looked for is the role of traditional agriculture equipment like *ani-ani* to open vacant work for farming labours toward community resilience.

The research about *bawon* uses ethnography with qualitative approach method. This research is conducted in Urug village, Sukajaya District, Bogor Regency, West Java, Indonesia. An ethnography deals with the discovery and description of the culture of a group. Culture is as what people do, a combination of various types of knowledge, belief, custom, art, moral, laws, habit, attitude of mind, pattern of human activity, literature, language, religion, religious activity transmitted from person to person, transmitted from generation to generation, consisting of everything we think, consisting of all efforts and adjustment, gratifying quality, continuous process, accumulative, interconnected with each other, changing and dynamic, varied from one society to other societies, etc (Sharma & Sarkar, 2019). This study involved a long period of intensive fieldwork and participatory observation with small tribes of indigenous people and advocated an approach to anthropology which sought to understand the culture from these people's perspectives.

On the other hand, anthropology had traditionally visited discrete communities in remote areas of the globe (Morgan-Trimmer & Wood, 2016).

Participatory observation provides ethnographers with an opportunity to gather empirical insights into social practices which are normally 'hidden' from the public gaze. Additionally, since it aims to generate holistic social accounts, ethnographic research can identify, explore, and link social phenomena which, on the surface, have little connection with each other (Reeves et al., 2013). In general, ethnography is focused on observation along with participation in social life (Kian & Beach, 2019). Ethnography is characterised by the in-depth observation of groups of individuals, being cognisant of the influences of historical and cultural contexts on social interactions (Streubert 2011 in Jones & Smith, 2017). Qualitative research is the process of research for transforming the world and converting the world to representation including fieldwork note, interview, conversation, photo, records, and private note (Creswell, 2014). Besides, ethnography can be mentioned as field research due to some reasons including the researcher who has to collect data suited to cultural and social phenomena. The other is that the researcher has to be involved in cultural and social activities to ensure data, because, without this, the researcher cannot investigate profoundly about the goals of the research.

Lastly, the researcher must work with traditional people to observe real-life of these people. In this ethnographic research, qualitative research is utilized to garnish information regarding the language, social phenomena, and cultural condition of Urug people. Ubah Ukat is as chief of this community as the main sample because he has the deepest knowledge about Urug society, both social and cultural. It can impact the quality of data because the chief of a community can explain about the traditional knowledge. Data are collected through in-depth interviews with Abah. Data are garnished including *bawon* system as a way to protect culture and tradition amid globalisation of agricultural technology, as well as *bawon* as the empowerment of women toward community resilience. Another is to investigate the merits of *bawon* sys-

tem in agriculture for labours in agriculture. Then, the data are about traditional equipment in farming for development of farming workers, typically for women, to react community resilience amid the application of high technology in farming, as well as it can overcome climate change as the cause as global warming. Data will be collected from numerous sources of data including journals and books which are linked to indigenous knowledge.

Then, observation is another way of collecting data. Observation can be mentioned as collecting data from observing directly, such as viewing objects and locations or real fact of the application of indigenous knowledge. Data will be investigated and analyzed by triangulation data to obtain valid data. Hardani et al. (2020) triangulation or seeing things from various perspective angles, means that verification of the findings using multiple data sources and various data collection methods. In this case the writer mentions it as multyanguation considering that it is not only limited to three angles, but it can be more or even only two perspective angles if it is deemed sufficient and or impossible to add to more angles perspective. Data triangulation will be mixed with several data including observation linkage to society and culture, in-depth interviews, and documentation. Observation has connected the researcher directly to view the environment in the vicinity of Urug people. It can be encouraged by an interview with the leader or key person of Urug people. The combination of the interview with main respondents, documentation, and observation can produce trusted data.

DISCUSSION

The tradition of Bawon for Resilience

Bawon is similar to a tradition in agriculture to empower agriculture workers amid globalization and state of art in agriculture. Farming labours have confronted numerous obstacles including the vanishing opportunity in subsistences because agricultural landlords have altered their behaviour to adopt

high technology such as tractor, harvester machine, and post-harvester technology. Directly, there are some impacts on encompassing the landlords which must reduce the number of farm workers because to operate tractor needs less human quantity. The impact on agriculture workers is looking for another job and suffering from a vulnerable situation economically. For combating this case, Urug people preserve *bawon* system through rendering paddy yield as a wage to a person without rendering money. People who are involved in *bawon* system do not need to own farming land and people are not necessary to melt funding as capital for the production of paddy, nurturing of paddy, and funding for harvest yield. All finance capital and natural capital (land) will be endured to the owner of the land. In Urug people, *bawon* system is imperative for agriculture labours as people are dependent on farming subsistence. Besides, *bawon* system can protect cultural tradition from extinction amid the use of technology such as harvester, tractor, and spraying machine. In *bawon*, handed-agriculture tools are implied such as sickle, hoe, and *ani-ani*.

There is a heavy connection between *bawon* and the preservation of traditional tools. Traditional equipment like *ani-ani* is the cultural capital because it can be vanished when *bawon* system is converted to another agriculture method. Then, *bawon* system in Urug has empowered women energy in agriculture, typically in gathering paddy panicles because work separation is divided wisely to suit work which can be completed by women and men. Women agriculture workers will collect paddy panicles with a hand tool such as *ani-ani* after harvesting paddy with panicle layout on the surface of the land. The men will continue to carry out work to move it to *lantayan* (a traditional tool for drying in the vicinity of land). In this activity, there is a job that suits to men and so does to women, but they can also do both. Directly, the social linkage between them is heavily strong binding. The women can share their issues when taking paddy panicles in the field with the

other women as well as with their landowners.

It creates a strong family connection through *bawon* because each person will be related in a social situation. *Bawon* has preserved women power in agriculture. Directly, *bawon* has an impact to build patron-client or social relation is severe stringency (Setiawan, 2017). It can be similar to a family because the owner of the land will not behave like a landlord, but it seems to be a family member. The owner of the land will count the number of paddy panicle binding, or in West Java, people call it as paddy *pocongan*. There is a threshold number that landlord will use in Urug. Besides, there is a local policy to involve farming workers in the planting period. The people who join in this period will obtain an entitlement for gathering paddy yield and following *bawon* system. In contrast, people will not join in clearing the grass in the paddy land (*ngowos*)/*ngeramet*) both in periods 1 dan 1. People are invited for collecting paddy yield when they are conducting action from cultivating to harvesting, typically for nurturing paddy tress (Isnainingsih, 2018).

Meanwhile, it can be distinguished in other locations. In Jambon district of Ponorogo regency, the owner of the land will render the farming workers 1/7 from overall paddy yields (Phambudi, 2019). Other locations, the labours of agriculture have 20% and owner obtains 80 % of the paddy yield (Wahyuni, 2016). In other findings, agriculture labours obtain 1/10 from overall paddy yields and get 2-5 kgs up to 10-15 kgs (Isnainingsih, 2018). However, *bawon* system can be implied to modern technology. For instance, when the owner operates treaser and combet (both of paddy threshers), as combet is operated by the landowner, agriculture labours will have 1 ton out of 8 tons and gain 1142,8 kgs from 8 tons when the owner of land operates treaser. Even, the agriculture labours can accept money after the owner counts the percentage of outcome which the labours have, then the owner transforms to money. It is similar to the value when people receive paddy grain (Yuliawati, 2019). Conversely,

when the people move dramatically to high technology, *bawon* system is no longer a traditional habit in agriculture.

This system can continue to vanish cultural value in agriculture. In Urug people, *bawon* system has been applicated from their forefathers to younger generation recently. The system still preserves although globalisation has occurred outside these people. It can be encouraged that *bawon* system has merits because agriculture labours can alter paddy to rice and jump the value economically. It can distribute numerous profits, such as labours of agriculture can comply with the basic needs because they receive paddy as wage (Yanti et al., 2019). *Bawon* system will not gain demerit to farming workers because they already know the amount of paddy as wage before collecting paddy, and the treaty will be conducted to both of them orally without paper (Pambhudi, 2019). Socially, it will build strong social bonding between the owner of the land and the agriculture labours as well as keeping paddy stock as long term for stockpiling paddy (Wahyuni, 2016). Another one is that *Bawon* system has to merit because the agriculture workers still obtain their entitlement as they are involved in planting section, but they are not involved in harvesting period, and the owner of land still renders paddy as reward suited with a previous treaty between the landowner and farming workers (Surjono, 2015).

Bawon system also constitutes a social charity of the owner of agricultural land to empower the people who are landless. Even, all farmers who have land must demand the farming workers to obtain a job, like through the *bawon* system (Abdurrahim et al., 2014). In its application, there is no treaty between the landowner and agriculture workers about the amount of paddy that will be received by the agriculture labours because they have comprehended it and trusted each other (Janah, 2016). In this system, it is shown a local policy, such as indigenous knowledge as social capital and has an imperative role to create resilience (Melore & Nel, 2020). Traditional people like Urug community have cre-

ated a resilience based on society and ecology because the local policy like *bawon* system in agriculture has successfully faced the globalisation without the extinction of their tradition and culture. Persistence and adaptation are resiliences (Vallés-Planells, Galiana & Díez-Torrijos, 2020).

The principle of persistence can be identified when Urug people preserve *bawon* other than outside the community, where people have adopted machine power to collect paddy, to do soil ploughing, and to carry out more post-harvest activities. Even, the way to pay agriculture labours has transformed to the distribution of money to agriculture workers instead of rendering paddy as wage. Besides, for the agriculture labours, they do not require to alter their livelihood sources outside agriculture because they can fulfil their fundamental needs like food and finance from *bawon* mechanisation. There are at least two sorts of resilience which can be achieved including economic and social resiliences (Yang et al., 2020). *Bawon* in Urug people can react to economic resilience because *bawon* can encourage the economy of Urug community, typically for the agriculture workers. The farming workers can lose their income sources when *bawon* has been converted to modernisation.

Bawon in Urug community can underpin social resilience because the people can socially cope with perturbances such as a transformation of technology or an application of harvester machine. People conserve *bawon* as the best for agriculture labours. Such collective action as this one can enhance the capacity of resilience (Hellin et al., 2018). Even, these people will not experience to become unemployed in rural area due to the implementation of technology in farming. Directly, the people will evade from stress and pressure of modernisation in agriculture. Meanwhile, resilience includes people who can overcome external pressures, trauma, or disturbances, as well as changes in their internal dynamics (Ruiz Agudelo et al., 2020). The impact is that cultural and social resiliences can be attained through *bawon* because *bawon* is a

culture and social system. In *bawon*, there is a severely strong relationship because the relationship between the landowner and workers is severely close, like family.

***Ani-Ani*: Traditional Appliance and Resilience**

Urug people combat global warming by utilizing traditional equipment without the adoption of modern technology from outside; although they do not fully refute the technology. Urug people have alleviated emission through the application of the persistence principle to conserve *ani-ani* (traditional appliance for the harvesting paddy). Urug people have contributed to abolishing the rate of emission in the atmosphere because, in this step, people avoid using fuel for technology. Meanwhile, the use of fuel can be mentioned as a fundamental factor to scale up emission gases like carbon dioxide (CO₂) on earth, especially for the diesel engine. Gholami et al. (2013) revealed that there are some exhausted gases from the tractors in each condition measured such as hydrocarbon (HC), carbon monoxide (CO), carbon dioxide (CO₂), oxygen (O₂), and nitrogen oxide (NO). The pollution can be worsening when the control of emission is severely limited, and as a result, it can impact on the air quality and health of people (Shao, 2016). To reduce the emission rate in agriculture, Urug people conserve *ani-ani* as a tool for collecting paddy as well as a local cultural tradition. It is traditional equipment for chopping paddy panicles. There are some parts of this tool, including knife and body. The knife can be made from steel, while wiled wood is used for making the body. In addition to it, the handling of a tool is made from bamboo and wood. Wahyuni (2017) revealed that *ani-ani* is typically a tool that is functioned to collect paddy panicles, the use of which is by holding the tool. *Ani-ani* is a knife with an iron blade and a carved bamboo handle called *etem* or *ani-ani* in Javanese (Iskandar & Iskandar, 2016).

Urug people engrain to young people for utilizing *ani-ani* for gathering paddy panicles one by one with hand or *heteng* (in Sun-

danese language, *heating* is a traditional tool for harvesting paddy). There is the reason why local people such as Urug community hesitate to wield paddy harvester to collect paddy panicles. People trust that each paddy represents a goddess of Sri. In Java, the mythology about the goddess of paddy or goddess of Sri has embedded in tradition as well as behaviour in agriculture. Traditional people trust that cultivating paddy is the step to marry the goddess of Sri or *Nyi Pohaci Sanghyang Asri* as the symbol of women to earth as that of the men (Jamaludin, 2013). People will not be allowed to conduct abrasive behaviour to the goodness of Sri when they are taking paddy panicles one by one in the field. The goddess of Sri has been believed as the symbol of agriculture, especially paddy, which represents the clue of land fertility and the symbol of food (Dewi, Supriyadi, and Dasuki, 2018). Even, goddess of Sri is believed as the safeguard of land (Shomad & Adinata, 2020).

Then, goodness of Sri is perceived as a life symbol (Rohmana & Ernawati, 2014). This tradition of Java people in the rural area creates behaviour, guides, and rules that farmers must adhere to. Similarly, Urug people also think that if they use modern technology such as machine, the goddess of Sri will be hurt and grieved by us when it comes the harvest season. Traditional people are also reluctant to adopt a harvester machine because they must respect the paddy ([siapa?] 2012). In order to appreciate and conserve the tradition, Urug people still wield *ani-ani* as a tool for garnishing paddy. The principle to operate this tool is that both of hand wields for picking paddy, left hand for holding paddy panicles, and right hand for garnering paddy with *ani-ani*.

The use of *ani-ani* has an advantage such as the people can select which paddy is really mature and conforms to be collected, and which paddy must be avoided and waiting until the paddy is appropriate to gather (Suranny, 2014). When gathering the paddy, there are separated chores between female and male during the harvesting period. The

role of women is garnishing paddy panicles with hand appliance namely *eteng* or *ani-ani*. The women will let paddy panicles on the surface of the land. Meanwhile, the men collect paddy panicles from land and hang paddy panicles in *lantayan*. The males also have the duty to invent *lantayan* for keeping the paddy temporarily in the field before storing it in traditional storage named *leuit*. Urug people have empowered the role of women in the development of traditional harvesting. It is common to involve women in the manual harvest in Indonesia, except for South Sumatera Indonesia where the men are hired seasonal (Akter et al., 2017).

Even, promoting gender equality in agriculture can help reduce extreme poverty and hunger. Equality for women will be good for agricultural development (Patil & Babu, 2018). Meanwhile, empowering women for resilience is fundamental (Jaka & Shava, 2018). At the same time, when collecting paddy with *ani-ani*, women as paddy pickers require more than three women. It is impossible for them to keep silent, so they will share their life condition, talk with others, and discuss the issues on obstacles in life as well as life happiness. On the other hand, social relation can be mentioned as capital for resilience (Mohan, Hardee & Savitzky, 2020). It can jump the capacity of women as they have life perturbances in the household because the other enables to assist and look for solutions. Immediately, social relation among women will be bound tightly in the women group. Noviryani et al. (2019) revealed that women empowered themselves through women group that can encourage their awareness in accessing economic resources and knowledge, as well as helping them to gain more control over the process of production from the farm.

In addition to it, resilience is an emergent property in which the capacities are linked and acted together (Faulkner, Brown, & Quinn, 2018). Unfortunately, the role of women has been overlooked although women play a substantial role in farming and farm management (Rahman et al., 2020). How-

ever, women in Urug community have full opportunities in the development, typically in agriculture. If *ani-ani* tool is about to vanish, the role of women will be abolished in the traditional community in Urug. Another advantage of using *ani-ani* is to preserve *traditional equipment* from vanishing amid the application of agriculture such as machine when farmers are harvesting paddy. It is also connected to local variations in which the stump of paddy is higher than that of the modern variety. As a result, the local people wield *ani-ani* (Yunindyawati et al., 2014). There is a cultural value behind the utilization of *ani-ani*. Urug people still stand for the implementation of this equipment when they gather paddy from the field, and there are no Urug people who use paddy harvester machine to collect paddy. This principle is connected to cultural resilience because Urug people are persistent to implement this behaviour to the younger generation. The impact is that local culture will not be extinguished amid globalization. The farmers in Urug have a concerted policy to applicate *ani-ani* locally.

The implementation of *ani-ani* has another benefit such as opening vacant jobs for people in a rural area for garnishing paddy. The bigger number of employees is required instead of using technology. As Urug people adopt tractors as the equipment for preferring land, it requires fewer people to operate. The impact is that local resources can be involved, and people will not lose their jobs. Another value is that *ani-ani* is agriculture equipment severely friendly to the environment because *ani-ani* does not use fuel when operated. It can contribute to a declining rate of emission from agriculture as compared to the high technology of farming. It enables these people to effectively cope with unexpected events, bouncing back from crises, and even fostering future success (Duchek, 2019) after all paddy yield is collected by the people. The rate of liquid of paddy must be vanished before keeping paddy to *leuit*. Urug people wield *lantayan* for hanging paddy to decline the rate of liquid in paddy.

Urug people let paddy in *lantayan* until the paddy can be categorized as appropriate to be stored in a long period of time. This tool is equipment for hanging the paddy (Budi et al., 2014). The impact is that the quality of paddy will not deteriorate because paddy is dried before being stored in *leuit*, namely 14 percent (Iskandar & Iskandar, 2017). To vanish water in paddy grain requires 14 days in *lantayan* (Satriadi, 2015). The principle of this equipment is that the whole paddy panicles are tided and hung up in *lantayan*, particularly in the field. Both grains and panicles must be hung together at *lantayan*, but to farmers other than Urug people, grains and principles must be separated before drying. *Lantayan* is the hunger for drying paddy before storing step. In this stage, paddy will be hung one by one by people until losing the liquid from the grains. There are three or four storeys of *lantayan*, each of which will be filled by paddy. In this principle, the grains will not be insisted on the loss of grain liquid because grains are just hung at *lantayan* naturally.

Paddy in *lantayan* is avoided from sunshine directly. People rebuff to dry immediately under sunshine because grains may not be insisted on relinquishing liquid in them. Urug people may monitor the rate of liquid substance in paddy, and they must guarantee that paddy has lost water in both skin and rice. After the grains are dried, people bring all paddies to be stored in *leuit*. This is similar to a small building with wooden or bamboo wall and *rumbia* roof or sago palm. Paddy will be stored directly in this building. When intending to fulfill their basic needs, people will collect some paddy in the traditional store (*leuit*). Post-harvest of paddy which is followed by this step can preserve paddy grains and rice in a long term. In Urug people, paddy aged 30 can be viewed in a traditional store like *leuit*. Even, rice can withstand for 25 years when people apply the three steps to produce rice. Conversely, in the modern era, people will rarely salvage paddy, but these people have rice stored. Meanwhile, when rice is stored, it can be easier to compost instead of keeping paddy as the Urug people

do. It will be exacerbated by the action where the farmers use sunshine immediately to decline the rate of water in grains.

On the contrary, Urug people utilize *lentayan* to reduce the liquid in grains. After that, these people have to separate the paddy from its skin. In Urug, it is still operated a traditional way namely *lesung*. *Lesung* is traditional equipment in Indonesia to produce rice by hand. There are two kinds of this tool, namely *jerker* (*lalu*) and *lesung* (wooden mortar). The *jerker* will be used for hitting paddy after the paddy is poured to *lesung* (wooden mortar). The people will hold the *jerker* and hit the *lesung* continuously in which the paddy grains have been there. If the paddy has cracked, the paddy will be moved to *nyiru*. This tool is made from bamboo with a role of winnowing rice from the skin. Rice can be cleaned after the people use *nyiru* by hand. They will cook rice partly and keep the rice in *kendi* for another time reserving.

Lastly, for ploughing land, Urug people use an animal rather than a tractor. Animals such as buffalo are utilized to plough the land for cultivation. The people who have animals like buffalo will be hired by other people who do not own animals. In this step, many workers must be involved because human power is required to drive buffalo and need people to plough with a hand tool like a hoe. Directly, unemployment in village area can be declined by distributing jobs for the agriculture workers. Another reason is that tractor will not be applicable geographically in Urug people because of the land condition in urug community which is located in the mountain area. Farming activity is conducted on the hill until the top of the mountain. The technology like the tractor is impossible to be applied in this area because the tractor has a limitation, namely that this tool is only usable for flat land.

Further, the use of animal can gather gains such as producing natural manure or organic manure for farming. Even, it can be produced the fertilizer for land and create sustainability because it can improve the

nutrient of soil compared to the application of factory manure. Meanwhile, in numerous findings, mechanization has numerous disadvantages to society and culture of the farmers in the rural area including that mechanization has neglected smallholders of farms located in the hills and mountains and has biased mechanization policy for flat areas only (Devkota et al., 2020). The other adverse impact is that the mechanization of agriculture decreases the need for manual labours and, thus, releases labours out of agriculture (Bhandari & Ghimire, 2016). In Indonesia, typically in Cidaun, Cianjur, Indonesia has a bad impact because replacing traditional tool like animals (buffalo and ox) for ploughing can decrease the population of these animals, even continuing to extinct. It can be compounded by overlooking women power in agriculture because this work must be completed by men (Partasmita et al., 2019). The impact is to show gender inequality between women and men because the men will dominate tractor operation (Prayoga et al., 2019).

Besides, people who have traditional tools in agriculture cannot obtain an opportunity to be involved in this action (Rifkian, Suharso & Sukidin, 2017). Then, some labours lose their job opportunities, and some others got less income from the local income share system. Farmers are unprepared to manage agricultural machinery. It is necessary to provide alternative employment for the affected workers (Purwantini & Susilowati, 2017). After that, while tractor has limitation such as market failures concerning access to spare-part supplies and credit, mechanisation is constrained by missing institutions, particularly those that will be required to ensure adequate skill development of tractor operators and technicians (Daum & Birner, 2017). The implementation of traditional equipment in Urug people can impact on the increased capacity of people to cope with life perturbation in both social and climate issues, as well as environmental dynamics. The fundamental principle like consistency in using animal and hand equipment of agriculture can attain community resilience.

CONCLUSION

Indigenous knowledge is knowledge which has been adapted for numerous life perturbances including climate, society, environment, and technology. The people have experienced learning the change and take actions to confront the situation locally. It is also strongly related to tradition, culture, and behaviour which are practically applied without any theory; yet, it is applicable and sustainable. In this research, there are several conclusions including *bawon* system in farming which has protected tradition and culture as well as the social system in traditional community to react resilience because culture and social binding can be damaged when it is fully converted to modernisation in agriculture. Furthermore, it leads to empowering agriculture workers because the role of *bawon* is to give job opportunities to landless people.

The impact is that people can obtain jobs and possibly comply with their basic necessities from this system. The other is preserving traditional equipment result to empower women power in farming because hand tool like *ani-ani* can be applied by women. It can vanish when *ani-ani* or traditional agriculture appliance is converted to modern agricultural technology. At the same time, women are no longer empowered because the power of women is changed by men. Besides, protecting traditional tool like *ani-ani* is one endeavour to protect culture from extinction. Another equipment like *lantayan*, wooden mortar and ploughing which use animals have an impact to reduce emission as well as applying *ani-ani* for collecting paddy yield.

BIBLIOGRAPHY

- Abdurrahim, A.Y., Dharmawan, A.H., Sunito. 2014. Kerentanan Ekologi Dan Strategi Penghidupan Pertanian Masyarakat Desa Persawahan Tadah Hujan Di Pantura Indramayu. *Jurnal Kependudukan Indonesia* 9 (1) 25-44.
- Aini, S.N., & M. Shafi'. 2019. Tradisi Mipit Pare Di Kasepuhan Ciptagelar Mengejar Bayangan: Perlawanan Semu Buruh Panen Dalam Melawan Hegemoni Alat Panen Milik Tuan Tanah. *Jurnal Ilmu-Ilmu Ushuluddin* 07 (1):133-150.
- Akter, S., P. Rutsaert, J. Luis, N.M. Htwe, S.S. San, B. Raharjo & Arlyna Pustika. 2017. Women's empowerment and gender equity in agriculture: A different perspective from Southeast Asia. *Food Policy* 69: 270-279.
- Aldrich, D.P. & Meyer, M.A. 2015. Social capital and community resilience. *American Behavioral Scientist* 59(2), 254-269.
- Bhandari, P., & D. Ghimire. 2016. Rural Agricultural Change and Individual Out-migration. *Rural Sociologyl.* 81(4): 572-600.
- Budi, D.S.U., R.M. Soedarsono, T. Haryono, & T. Narawati. 2014. Angklung Dogdog Lojor pada Upacara Seren Taun. *Jurnal Resital.* 15 (2):139-151.
- Creswel, J.W. (2014). Research design : qualitative, quantitative, and mixed methods approaches. SAGE Publications: India.
- Daum, T. & R. Birner. 2017. The neglected governance challenges of agricultural mechanisation in Africa - insights from Ghana. *Food Sec* 9:959-979.
- Devkota, R., L.P. Pant, H.N. Gartaula, K. Patel, D. Gauchan, H. Hambly-Odame, B. Thapa, & M.N. Raizada. 2020. Responsible Agricultural Mechanization Innovation for the Sustainable Development of Nepal's Hillside Farming System. *Sustainability* 12 (374):1-24.
- Dewi, T.K.S., H. Supriyadi, S. Dasuki. 2018. Kearifan Lokal Mitos Pertanian Dewi Sri dalam Naskah Jawa dan Aktualisasinya sebagai Perikat Kesatuan Bangsa. *Manuskripta*, 8 (2):89-107.

- Duchek, S. 2019. Organizational resilience: a capability-based Conceptualization Business Research 13:215–246.
- Ellison, D., C.E. Morris, B. Locatelli, D. Sheil et al. 2017. "Tress, forest, water: cool insight for a hot world". *Global Environment Change*, 43:51-61.
- Eriksson, M., L. Samuelson, L. Jägerud, E. Mattsson et al. 2018. Water, Forests, People: The Swedish Experience in Building Resilient Landscapes. *Environmental Management* 62:45–57.
- Faulkner, L., K. Brown, and T. Quinn. 2018. Analyzing community resilience as an emergent property of dynamic social-ecological systems. *Ecology and Society* 23(1):24.
- Folke, C. 2016. Resilience (Republished). *Ecol. Soc* 21 (44):!
- Gholami, R., H. Rabbani, A.N. Lorestani, P. Javadikia, F. Jaliliantabar. 2013. An experimental investigation of exhaust emission from agricultural tractors. *International Journal Of Energy And Environment* 4 (4): 713-720.
- Godfrey & K. Siraje. 2019. Community Development in the Rural Areas through Traditional Indigenous Knowledge. *International Journal of Research in Sociology and Anthropology (IJRSA)*, 5 (2): 8-17.
- Hardani, N.H. Auliya, H. Andriani, R.A. Fardani, J. Ustiawaty, F. Utami, D.J. Sukmana, R.R. Istiqomah. (2020). Metode Penelitian Kualitatif & Kuantitatif. Yogyakarta: Penerbit Pusataka Ilmu.
- Hellin, J., B. D. Ratner, R. Meinzen-Dick, and S. Lopez-Ridaura. 2018. Increasing social-ecological resilience within small-scale agriculture in conflict-affected Guatemala. *Ecology and Society* 23(3):5.
- Hosen, N., H. Nakamura, & A. Hamzah. 2020. Adaptation to Climate Change: Does Traditional Ecological Knowledge Hold the Key?. *Sustainability* 12 (676):1-18.
- Irena, F., Creed, M. Weber, F. Accatino & D.P. Kreutzweiser. 2016. Managing Forests for Water in the Anthropocene—The Best Kept Secret Services of Forest Ecosystems. *Forests* 7 (60):1-23.
- Iskandar, J., & B.S. Iskandar. 2016. Resilience of Baduy traditional agroforestry systems in responses to environmental and socio-economic changes. *Journal of Indonesia History* 4 (1):19-24.
- Iskandar, J., & B.S. Iskandar. 2017. Kearifan Ekologi Orang Baduy Dalam Konservasi Padi Dengan "Sistem Leuit". *Jurnal Jurnal Biodjati*, 2 (1):38-51.
- Jahed, R.R., S. M. Hosseini, Y. Kooch. 2014. The effect of natural and planted forest stands on soil fertility in the Hyrcanian region, Iran 15, (2): 206-214.
- Jaka, H. & Shava, E. 2018. Resilient rural women's livelihoods for poverty alleviation and economic empowerment in semi-arid regions of Zimbabwe', *Jambá: Journal of Disaster Risk Studies* 10(1):1-11.
- Jamaludin. 2013. Makna Simbolik *Huma* (Ladang) di Masyarakat Baduy (Symbolic Meaning of *Huma* (Field) in the Bedouin Community). *Mozaik* 13 (1): 46-54.
- Jannah, N.L. 2016. Pandangan Hukum Islam Terhadap Sistem Pengupahan Buruh Tani (Studi Kasus Wilayah Desa Pagersari Kecamatan Kalidawir Kabupaten Tulungagung Jawa Timur). Skripsi Jurusan Hukum Ekonomi Syariah Fakultas Syariah Dan Ilmu Hukum Institut Agama Islam Negeri (Iain) Tulungagung.

- Jones, J., & J. Smith. 2017. Ethnography: challenges and opportunities. *Evid Based Nurs* 20 (4):98-100.
- Jumari, D. Setiadi, Y. Purwanto & E. Guhardja. 2012. Etnoekologi Masyarakat Samin Kudus Jawa Tengah. *Jurnal Bioma* 14 (1):7-16.
- Karningsih. 2014. Mobilitas Sirkuler Wanita Pedagang Kaki Lima (Studi Kasus di Pasar Johar Kota Semarang). *Ragam Jurnal Pengembangan Humaniora* 14 (1):52-67.
- Masihin, J., W. Girsang, & S.F.W. Thenu. 2015. Dampak Modernisasi Pertanian Terhadap Pergeseran Budaya Gotong Royong (Studi Banding Antara Petani Di Desa Waihatu Dan Desa Waisamu). 3 (1): 51-66.
- Mátyás, C., & G. Sun. 2014. Forests in a water limited world under climate Change. *Environ. Res. Lett.* 9 (085001):1-11.
- Melore, T.W. & Nel, V., 2020, 'Resilience of informal settlements to climate change in the mountainous areas of Konso, Ethiopia and QwaQwa, South Africa', *Jàmbá: Journal of Disaster Risk Studies* 12(1):1-9.
- Mohan, V. & Hardee, K., Savitzky, C., 2020, 'Building community resilience to climate change: The role of a Population-Health- Environment programme in supporting the community response to cyclone Haruna in Madagascar. *Jàmbá: Journal of Disaster Risk Studies* 12(1):1-4.
- Morgan-Trimmer, S., F. Wood. 2016. Ethnographic methods for process evaluations of complex health behaviour interventions. *Trials* 17 (232):1-11.
- Munawaroh, S., C. Ariani & Suwarno. 2015. Etnografi Masyarakat Samin Di Bojonegoro (Potret Masyarakat Samin Dalam Memaknai Hidup). Yogyakarta: Kepel Press.
- Nadeau, M.B., & T.P. Sullivan. 2016. Relationships between Plant Biodiversity and Soil Fertility in a Mature Tropical Forest, Costa Rica. *International Journal of Forestry Research* 1:14.
- Noviryani, M., W. Handayani, Wike & K. Sukei. 2019. Understanding Women's Roles In Agriculture (Study of Women in Dairy And Shallot Farming in East Java). *Journal Salasika (Indonesian Journal of Gender, Women, Child, and Social Inclusion's Studies)* 2 (2):121-136.
- Pambudhi, R.Y. 2019. Praktek Upah Sistem Bawon Di Desa Menang Kecamatan Jambon Kabupaten Ponorogo Dalam Perspektif Hukum Islam. Skripsi Program Studi Hukum Ekonomi Syariah Fakultas Agama Islam Universitas Muhammadiyah Surakarta.
- Partasasmita, R., B. Iskandar, S. Nuraeni, J. Iskandar. 2019. Impact Of The Green Revolution On The Gender's Role In Wet Rice Farming: A Case Study In Karangwangi Village, Cianjur District, West Java, Indonesia. *Journal biodiversitas* 20 (1): 23-36.
- Patil, B., & V.S. Babus. 2018. Role of women in agriculture. *International Journal of Applied Research* 4 (12): 109-114.
- Podolak, K., D. Edelson, S. Kruse, B. Aylward, M. Zimring, and N. Wobbrock. 2015. Estimating the Water Supply Benefits from Forest Restoration in the Northern Sierra Nevada. An unpublished report of The Nature Conservancy prepared with Ecosystem Economics. San Francisco, CA.
- Prayoga, K., S. Nurfadillah, M. Saragih & A.M. Riezky. 2017. Menakar Perubahan Sosio-Kultural Masyarakat Tani Akibat Miskonsepsi Modernisasi Pembangunan Pertanian. *Journal on*

- Socio-Economics of Agriculture and Agribusiness* 13 (1): 96-114.
- Purwantini, T.B., & S.H. Susilowati. 2017. Dampak Penggunaan Alat Mesin Panen Terhadap Kelembagaan Usaha Tani Padi Impact Of Harvesting Machine Application On Rice Farming Institution. *Jurnal Analisis Kebijakan Pertanian* 16 (1): 73-81.
- Rahman, M.D.W., M.D.S. Palash, H. Jahan, S.M. Jalilov, & M. Mainuddin. 2020. An Empirical Investigation of Men's Views of Women's Contribution to Farming in Northwest Bangladesh. *Sustainability* 12 (3521): 1-21.
- Rahmawati, N.P.R. 2012. Nilai Pendidikan Dalam Budaya Menanam Padi Suku Dayak Kanayatn Di Kalimantan Barat The Value Of Education In Paddy Cultivation Of Kanayatn Dayak In West Kalimantan. *Patanjala* 4 (1): 15-25.
- Reeves, S., J. Peller, J. Goldman & S. Kitto. 2013. Ethnography in qualitative educational research: Medical Teacher 35 (8): e1365-e1379.
- Rifkian, B.E., P. Suharso & Sukidin. 2017. Modernisasi Pertanian (Studi Kasus Tentang Peluang Kerja Dan Pendapatan Petani Dalam Sistem Pertanian Di Desa Dukuhdempok Kecamatan Wuluhan Kabupaten Jember). *Jurnal Pendidikan Ekonomi: Jurnal Ilmiah Ilmu Pendidikan, Ilmu Ekonomi, dan Ilmu Sosial* 11 (1) 39-48.
- Rifkian, B.E., P. Suharso, And Sukidin. 2017. Modernisasi Pertanian (Studi Kasus Tentang Peluang Kerja Dan Pendapatan Petani Dalam Sistem Pertanian Di Desa Dukuhdempok Kecamatan Wuluhan Kabupaten Jember). *Jurnal Ilmiah Ilmu Pendidikan, Ilmu Ekonomi, dan Ilmu Sosial* 11 (1):39-48.
- Rohmana, J.A., & Ernawati. 2014. Perempuan Dan Kearifan Lokal: Performativitas Perempuan Dalam Ritual Adat Sunda. *Musâwa*, 13 (2):151-165.
- Ruiz Agudelo, C. A., N. Mazzeo, I. Díaz, M. P. Barral, G. Piñeiro, I. Gadino, I. Roche, and R. Acuña. 2020. Land use planning in the Amazon basin: challenges from resilience thinking. *Ecology and Society* 25(1):8.
- Ruiz-Mallén, I. and E. Corbera. 2013. Community-based conservation and traditional ecological knowledge: implications for social-ecological resilience. *Ecology and Society* 18(4):12.
- Satriadi, Y.P. 2014. Huma Orang Baduy Dalam Pembentukan Sikap Swasembada Pangan. *Patanjala*. 7 (3): 559 - 574.
- Scarano, F.R. 2017. Ecosystem-based adaptation to climate change: concept, scalability and a role for conservation science. *Perspectives in Ecology and Conservation* 15: 65-73.
- Setiawan, E. 2017. Konstruksi Mekanisasi atas buruh tani perempuan di pedesaan. *Martabat: jurnal perempuan dan anak* 1 (2): 197-218.
- Shao, Z. 2016. An Emissions Inventory For Agricultural Tractors And Construction Equipment In India. Working Paper: International Council On Clean Transportation.
- Sharma, H.L., & S. Chiranjit. 2019. Ethnography Research: An Overview. *International Journal of Advance and Innovative* 6 (2):1-5.
- Shomad, A., & T.P. Adinata. 2020. Tradisi Adat Methik Pari Di Desa Kalistail Kecamatan Genteng Kabupaten Banyuwangi (Studi Pendekatan Historis). *Jurnal Agastya* 10 (1): 35-47.
- Suaib, M. 2018. Dampak Teknologi pada usaha budidaya pertanian padi di desa Parambe Kecamatan Galesong Kabupaten Takalar. Skripsi Jurusan Ilmu Ekonomi Fakultas Ekonomi

- dan Bisnis Islam. Universitas Islam Negere Alaudin Makasar.
- Suradisastra., K & D. Priyanto. 2011. Pemberdayaan Posisi Dan Peran Tokoh Tradisional Dalam Upaya Pengembangan Ternak Di Provinsi Banten. *Wartazoa* 21(2):51-59.
- Suranny, L.S. 2014. Alat Pertanian Tradisional Sebagai Warisan Kekayaan Budaya Bangsa (*Traditional Of Agricultural Equipment As Nation Cultural Heritage Property*). *Jurnal Arkeologi Papua* 6 (1): 45-55.
- Surjono, G. 2015. Perubahan Sosial Masyarakat Segitiga Hilir Dampak Pembangunan Waduk Kedungombo Social Change of Downstream Triangle Community as an Impact of Kedungombo Dam Development. *Jurnal PKS* 14 (2):225 - 236.
- Thompson, K.-L., T. Lantz, and N. C. Ban. 2020. A review of Indigenous knowledge and participation in environmental monitoring. *Ecology and Society* 25 (2):10.
- Turasih., L.M. Kolopaking & E.S. 2016. Wahyuni Strategi Adaptasi Perubahan Iklim Pada Petani Dataran Tinggi (Studi Petani Di Dataran Tinggi Dieng, Kabupaten Banjarnegara) Climate Change Adaptation Strategy Of Upland Farmers (Study Of Farmers In Dieng Plateau, Banjarnegara Regency). *Sodality: Jurnal Sosiologi Pedesaan*. 70-82.
- Vallés-Planells, M., F. Galiana, and I. Díez-Torrijos. 2019. Agricultural abandonment and resilience in a Mediterranean periurban traditional agroecosystem: a landscape approach. *Ecology and Society* 25(1):5.
- Wahyuni, D. 2016. Analisis Sistem Pengupahan "Bawon" Pada Pertanian Padi (Studi Kasus Pada Petani Di Desa Gambar Kecamatan Wonodadi Kabupaten Blitar). *Jurnal Bisnis, Manajemen & Perbankan* 2 (2): 121-140.
- Wahyuni, T. 2017. Makna Kultural Pada Istilah Bidang Pertanian Padi Di Desa Boja, Kabupaten Kendal, Jawa Tengah (Sebuah Tinjauan Etnolinguistik) (*Cultural Meaning on Planting of Rice Term in Boja, District of Kendal, Central Java (An Etnolinguistics Study)*). *Jalabahasa*, 13 (1): 20-30.
- Yang, Y., H. Guo, L. Chen, X. Liu, M. Gu, and W. Pan. 2020. Multiattribute decision making for the assessment of disaster resilience in the Three Gorges Reservoir Area. *Ecology and Society* 25(2):5.
- Yanti, A.R., K. Safitri, L. Jannah, N. Usman. 2019. Pengupahan Buruh Panen Padi di Desa Pagersari Mungkid, Magelang (Analisis Hukum Islam). *Jurnal Ilmu Syari'ah Dan Hukum* 4 (1): 17-29.
- Yuliawati, E. 2019. Pengaruh Penggunaan Alat Pemanen Padi Modern Terhadap Kesejahteraan Buruh Tani Desa Nampirejo Kecamatan Batanghari Kabupaten Lampung Timur Perspektif Ekonomi Islam. Skripsi Jurusan Ekonomi Islam Fakultas Ekonomi Dan Bisnis Islam Institut Agama Islam Negri (Iain) Metro.
- Yunindyawati., T. Sumarti, S. Adiwibowo, A. Vitalaya., & Hardiansyah. 2014. Sejarah pertanian lebak, peran perempuan dan pangan keluarga di Ogan Ilir Sumatera Selatan. *Jurnal Paramitha* 24 (2): 211-221.
- Zilberman D., Lipper L., McCarthy N., Gordon B. (2018) Innovation in Response to Climate Change. In: Lipper L., McCarthy N., Zilberman D., Asfaw S., Branca G. (eds) *Climate Smart Agriculture. Natural Resource Management and Policy*, 52.