

REVIEW ARTICLE

## CERTIFICATION OF ORGANIC AGRICULTURE FOR RICE PRODUCTION IN INDONESIA

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### ABSTRACT

To make better the life, it is required safety foods for health. The health foods can be satisfied by organic farming. Organic farming is farming system based on biomass recycling or eliminating the use of materials as a synthetic agrochemical inputs. To determine whether the result of rice called as an organic product needs to be certified by the Organic Certification Board (OCB). According to the Indonesian National Standard (INS) 6729: 2013, organic farming systems (OFS) are not only limited to not use material agrochemical synthetic, but must meet the requirements of OFS in rice production ranging from cultivating, handling, storage, processing, transportation, labeling, marketing, production facilities and other materials that are allowed start on farm to off farm should be separated from conventional agriculture. The farm is just a negate the use of synthetic agrochemicals without regard to the cultivation process and the system of post-harvest organic results are said to be premium food which is not as organic food, because organic food is food produced from OFS by applying processing practices to preserve the ecosystem of sustainable, control of weeds, pests, diseases, selection and crop rotation, water management, land preparation and planting and the use of biological materials. Thus the system of organic agriculture is a holistic management system to improve and develop the agro-ecosystem health, including biodiversity, biological cycles and soil biological activity. The first step that must be done is the conversion of land for food crops from anorganic to organic farming for 2 years did not get the requisite amount of agrochemical applied to the soil for annual crop and 3 years for perennial crops. If agriculture in paddy soil can control the conventional farms into OFS, then the resulting rice is as an organic product.

**Keywords:** Rice cultivation, post-harvest, organic farming, organic food certification

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### INTRODUCTION

Awareness about the dangers of diseases caused by the use of synthetic chemicals in conventional farming makes organic farming attract human attention at both the producers and consumers, particularly in developing countries like Indonesia (Sudirja 2008, Parlyna and Munawaroh, 2011).

Reality on the field of Indonesian farmers have for years even during his lifetime is already very familiar with agrochemicals in the form of synthetic fertilizers and pesticides. They will not be planting the food crops if it is not available synthetic agrochemicals in the markets (Sarawa, 2014). Farmers do not realize that the use of synthetic agrochemical will be leaving chemical residues that are harmful to human and animal health as well as land and

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### REVIEW ARTICLE

water resources will be polluted. This incident caused consumers start looking for products that are safe to health and environmentally friendly (Mayrowani, 2012). In 1998, according to a survey conducted in Europe found that 94% of respondents buy organic products because they are very concerned with their health (Eureka Indonesia Foundation Website, 2009).

Some of the reasons why consumers opt for organic foods, namely (1) residue-free synthetic chemicals, (2) more nutrients, (3) it tasted more delicious, (4) protect the environment and reduce pollution, (5) free of drugs, hormones and antibiotics (Kompas Automotive Website 2008-2010 *in* Parlyna and Munawaroh, 2011). Thus the food that is safe for health and environmentally friendly can be obtained through OFS. Cultivation of plants in organic farming taking an ecosystem approach is consistent with the ecological and biological processes, maintenance of soil fertility, control of plant pests naturally and diversification of other living creatures in the ecosystem. The basic principles of organic farming include three things which are environmental principles, social and economic (Directorate General of Food Crops, 2016). According Regulation Minister of Indonesian Agriculture No.64/Agric.regulation/OT.140/5/2013 article 1, paragraph 1, the system of organic agriculture is a holistic management system to improve and develop the agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity. Furthermore, organic farming emphasizes the application of management practices that prefer the use of production inputs from farming activities in the land, by considering the adaptability of the local conditions. If possible this can be achieved with the use of cultural, biological methods, and mechanics, which does not use synthetic materials to meet specific needs in agricultural systems. The advantages of consuming organic foods are (1) organic foods have antioxidant 50% higher, contains more vitamins and minerals, (2) safe for infants and children, (3) genetic engineering undisclosed, (4) the animals were

healthy, and (5) environmentally friendly (Organic Food Store (2009) *cited* Parlyna and Munawaroh, 2011).

With the increasing demand of consumers of organic products, the area of organic farming in Indonesia also tends to increase with the increasing demand for organic market that in 2007 comprehensive organic farming amounted to 40,970 ha, in 2008 increased to 208,535 ha and in 2010 reached 238,872.24 ha, but in 2011 decreased down to 225,062.65 ha, because in 2011 many farmers are unable to continue organic farming certification (Mayrowani, 2012). Plants that have been organically certified include coffee (35,000 ha), forest honey (15,000 ha), spices (10 ha), organic rice (3,000 ha) followed by cocoa and tea (spoi 2011 *in* Mirawati, 2011). According Perbatakusuma et al (2009), total organic farm in Indonesia reached 65,000 ha with a variety of commodities that are grown such as rice, vegetables, fruits, tubers, coconut, vanilla, medicinal plants, spices, coffee, tea etc.

United States (US) and Germany are countries with the largest organic food consumption levels (Anonymous, 2011). The development of the organic food market in the US since 1990, about 20% annually (Indonesia Organic Farming Insurance Agency, 2006). Organic farming world in 2011 specifies that the domestic organic food market in 2009 is the US's largest with a value of 17,835 billion euros, followed by Germany amounted to 5,800 billion euros, 3,041 billion euros in France. Seven other countries in the top 10 organic food market is British (2.065 billion euros), Italy (1,500 billion euros), Canada (1,284 billion euro), Switzerland (1,023 billion euros), Japan (1,000 billion euros), Spain (0,905 billion Euro) and Austria (0,868 billion euros). The main markets of organic products from Asia such as Indonesia are developed countries (Parylna and Munawaroh, 2011), for developing community has not been much interested in organic products due to relatively expensive. However in the assessment of the certification of OFS are not based on the end product, but rather on the

### REVIEW ARTICLE

production process ranging from cultivation up to distribution, in accordance with the INS 6729: 2013 on OFS. The implementation of application systems and controls of organic products is regulated in the Minister of Agriculture of the Republic of Indonesia Number 64 /Agric. regulation/OT.140/5/2013 (Director General of Food Crops, 2016). OCB should have responsibility and control for rice certification and Government and/or private organization should handle for payment certification process. The certified rice product will have higher price on market and will be good for health.

#### **Land Constraints of Paddy Soils and Possible Application of Organic Farming Systems**

There are some constraints on marginal land for paddy soils in sub-optimal lands, among others: (1) the difficulty in providing enough water to support the farm productive and profitable, (2) the nature of high soil acidity thus it takes effort to neutralize the acidity of the soils, (3) the dynamics of pairs receding puddles that are difficult to predict it thus resulting in failed crops and crop failure, (4) land intruded sea water, (5) there is a layer of pyrite shallow to be a threat for poisoning the root system of plants, (6) a very poor nutrient thus requiring dose of fertilizer higher, and/or (7) the rocky soils so difficult to process mechanically (Lakitan and Gofar, 2013). Based on the agro-ecosystem and obstacles encountered above, sub-optimal land divided into two agro-ecosystem that is sub-optimal land on dry land and sub-optimal land on wetlands. More than 68.1% sub-optimal land is dry land area of 62.9 million ha and the other is swamp land area of 21.5 million ha (Ministry of Indonesian Agriculture, 2013 *cit.* Lakitan and Gofar, 2013). In the discussion following article will be raised about the sub-optimal land of wetlands or swamps for rice production that given the swamp land in South Sumatra and Jambi had opened at Pelita I (The first five-year development phase) on period of 1969-1974 for agricultural crops and transmigration of

22,000 ha and clearing the swamps were continued until the 2000s.

The tidal land for rice cultivation dominated by acid sulphate soils have a soil pH below 3.0. With a low pH is then on tillage layer is being poisoned  $\text{Fe}^{3+}$ ,  $\text{Al}^{3+}$  and  $\text{H}^+$  due to pyrite oxidation that causes nutrient essential both macro and micro are not available (Budianta and Windusari, 2016). To increase the potential of tidal land that needs to be corrected either the chemical, physical and biological aspects to produce rice as expected. Relation to organic farming, the tidal land management must be done based on Regulation of the Minister of Agriculture No. 64/OT.140/5/2013 in 2013 and INS 6729: 2013. For tidal land must meet the criteria set out in the Regulation of the above include: Land and land preparation: (a) business unit should have a record of the history of land use clear, (b) land formerly used for conventional agriculture must undergo the conversion period at the latest 2 years before stocking, or 3 years for perennial plants before harvesting the first results of organic products or a minimum of 12 months prior to the application of organic farming, (c) if the former pasture, the land can be directly used for organic farming and should not be preparing land by burning. Seeds should be eligible include: (a) must come from plants that are grown organically, (b) if organic seed is not available, then (1) the early stages can be used seed without treatment of synthetic pesticides, (2) seed have got treatment of synthetic pesticides should be taken to minimize the leaching of synthetic pesticide residues, (3) seed media does not use synthetic fertilizers, and (c) should not be derived from genetically modified. Source water must meet the following criteria: (a) comes from springs that are directly or from other sources are not contaminated by synthetic chemicals, (b) water from other must have undergone treatment to reduce contamination, (c) the use of water must be in accordance with the principles of conservation. To improve soil fertility, you need to do is (1) to maintain and improve soil

## REVIEW ARTICLE

fertility and soil biological activity by planting legumes, green manure or plant roots in through rotation of annual crops appropriate, (b) mixing the organic material into the soil in the form of compost or fresh from farming unit (Minister of Indonesia Agriculture No. 64 /Agric. regulation/OT.140/5/2013).

Composting of 5 tons ha<sup>-1</sup> in SRI paddy rice cultivation increased the B/C ratio of 1.97 compared with conventional rice only get B/C ratio of 1.2 (Syamsudin and Aktaviyani, 2009). Byproduct livestock may be used when coming from a farm organically grown, (c) for the activation of compost can use microorganisms, (d) materials biodynamic of dust or powder may be used for the purposes of enrichment, improvement and soil biological activity, (e) the remains of plants and other materials to be composted properly and should not be burned, (f) if an attempt to meet the plant nutrition is not possible may use materials that are restricted as a soil fertilizer, (g) to maintain fertility and soil biological activity are prohibited from using synthetic fertilizers, animal waste directly, human feces and pig manure, (h) additional material that may be used as a soil conditioner which are green manure, dung, urine cattle, etc. For the control of plant pests carried out by (a) does not use synthetic chemicals or genetically engineered agricultural products, (b) does not perform the combustion process in weed control, (c) implementing systems to control pests and diseases integrated so as to reduce losses due to plant pests, (d) pest to be controlled by one or a combination of the following ways: (1) selection of varieties appropriate, (2) program crop rotation, (3) tillage mechanically, (4) use of trap crops, (5) use of green manure and leftover cuttings, (6) controls the mechanical such as traps, barriers, light and sound, (7) preservation and utilizing natural enemies, (8) diverse ecosystems, (9) weed control by heating, (10) grazing livestock, (11) the preparation of biodynamic from stone meal, animal manure, (e) use of other materials such as (1) pesticide plant, (2) tobacco, (3) propolis (4) vegetable oil and animal, (5)

seaweed, (6) gelatin, (7) lecithin, (8) casein, (9) a natural acid, (10) product of fermentation of aspergillus, (11) yeast extract, (12) chlorella extract, (13) inorganic compounds, etc. In principle should be separated between conventional and organic products (Minister of Indonesian Agriculture No.64/Agric.regulation/OT.140/5/2013).

### Organic Farming Certification System Procedures

Farmers in Indonesia are generally landless with a very narrow area of land of less than 2 ha. In this case will be given organic farming application in rice production in tidal land. To facilitate the adoption of OFS need to be created groups of farmers so that a wider expanse and make it easier to organize and control the process to allow for organic farming certification and alleviate the costs incurred. In the farmers' groups are created organization with various sections such as seeds and harvest section, processing and sales section.

Certification is a way to guarantee that the products produced in accordance with established standards. In accordance with INS 6729: 2013 on OFS, certification is defined as a procedure in which the OCB or government recognized certification bodies provide written or equivalent assurance that foods or food control systems in accordance with the organic to the terms. This certification aims to protect consumers as well as producers from unfair trade, counterfeiting and improper use of labels (Mirawati, 2011). Further Mirawati (2011) reported that certified organic farmers who have higher income and different significant compared with a group of farmers who are not certified organic. Grain yield of conventional system of Menthik Wangi variety was only 3.05 t ha<sup>-1</sup>, while the organic system was up to 4.86 t ha<sup>-1</sup> (Mungara et al., 2013). OFS was started certifying rice production in 1995 in Thailand (Win, 2016), 1998 in Malaysia (Suhaimi et al., 2016),

The main step that must be done for preparation for a certification is registration of prospective participants organic farming and

REVIEW ARTICLE

preparation of ICS (Internal control system) prior to certification by OCB of Indonesia or international done, appointment internal inspector members and some members of the commission for approval. Preparation of ICS is a standard BioCerta, IFOAM and INS. ICS is a documented quality assurance system, which permits the OCB to delegate the annual inspection of all members of farmers individually to institutions of service that has been certified. This means that in the certification process, enabling the certification body to delegate the 'partial' inspection tasks in groups, known as internal inspection. While the OCB will act as an external inspection. For that the farmers' groups pointed to a few people who understand and know organic farming as an internal inspector and some as members of the commission for approval. ICS is a guide for participants organic farming which should be adhered to as a reference in the application of organic farming. Benefits of ICS is (1) farmers can provide a guarantee of product quality, (2) product farmers can get into the broader market, (3) farmers have a guarantee system that is accepted and recognized public and (4) farmers can perform product certification process more widely if required. For that document ICS shall contain (1) manually written rules and procedures ICS, (2) an explanation of the risks and control points, (3) the standards of organic production internally, (4) documentation of procedures internal inspections, results and solve problems, (5) there is an organized team, (6) the training of farmers and ICS teams, (7) the production flow, and (8) the internal inspection (Training Report, 2014). From the results of internal inspections submitted to commission approval to assess or make recommendations on the performance of internal inspectors. The certification system to enable certification ICS pattern for a wide area of land where the map becomes an important part in the assessment carried out by the internal inspector. The process of OFS and ICS can be seen in Figure 1 (Director General of Food Crops, 2016).

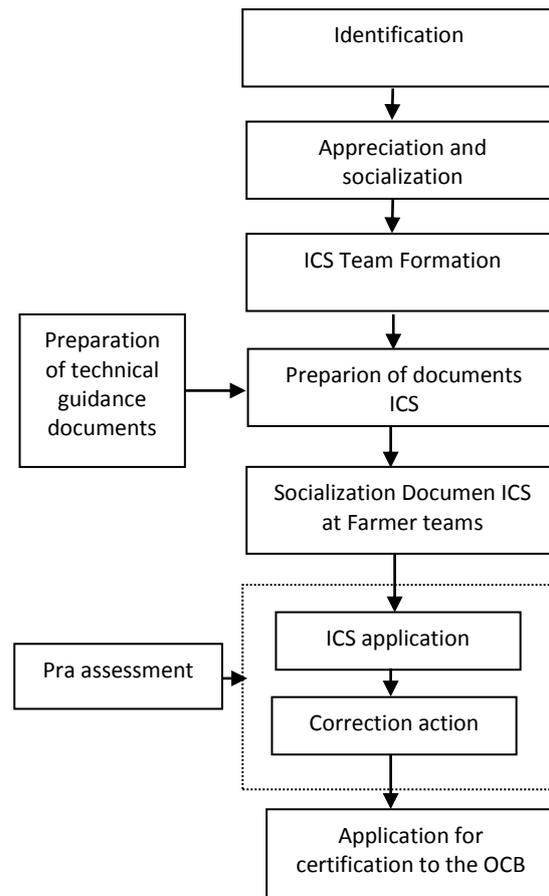
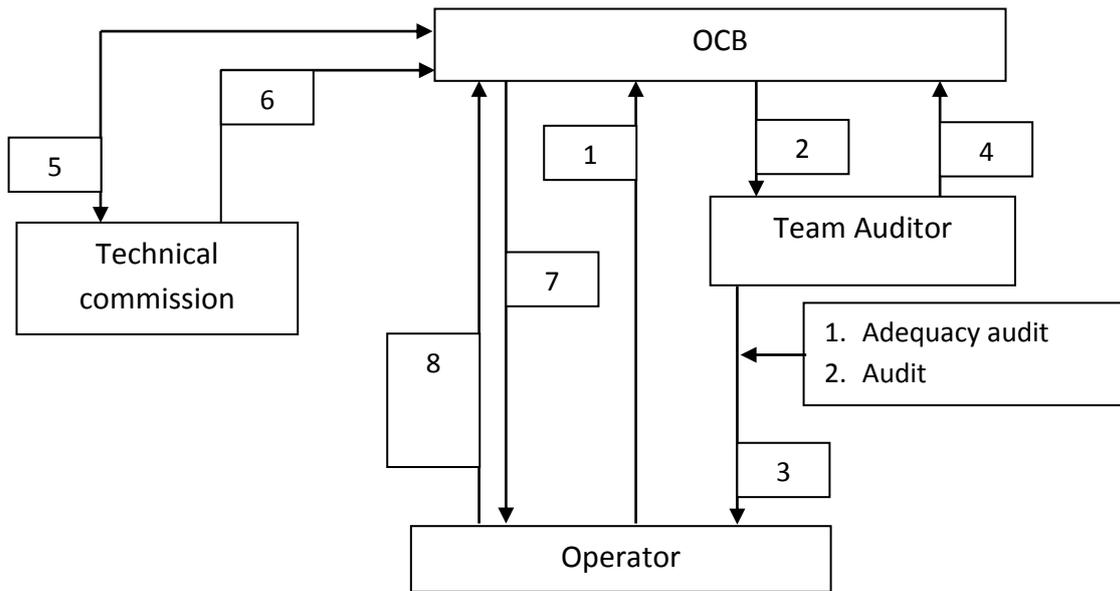


Figure 1. Process and implementation of OFS and ICS

Coordinator ICS is required to be able to run ICS. Selection of personnel is determined by the group which can be derived from Farmers Team board. There is no standard requirement set for this position, only to be able to walk the course is required capability at least in administrative management personnel, trained and capable of coordinating with all parties related to the certification program. ICS coordinator is an individual contact that will be seen by an external certification body.

Internal inspector is a field supervisor originating from farmer groups to conduct aud its to other groups who are not group or supervise the application of the OFS in accordance with each SOP. Some SOP must be owned as land management, SOP for seeds and plant maintenance, SOP harvesting and transporting crops, SOP processing, packaging and transport and marketing. Internal

REVIEW ARTICLE



**Figure 2.** The flow of organic farming system (OFS) certification

inspectors have minimum requirements that must understand OFS and the procedure that has been applied to ICS so that the people must be trained and especially no conflict of interest. The task is to supervise the internal inspectors regularly and can also at any time if necessary against members who will be part of its supervision. Results of monitoring inspectors internal should be reported to the commission agreement to be determined the status of the organic products proposed. The Commission approval will decide the position of member of the group based on the results of an internal audit by the inspector also involving experts. During the external examination by OCB, the effectiveness of ICS will be evaluated. External inspectors will check back in a number of farmers. The percentage of external control will be determined by OCB on the basis of risk analysis. In addition, the inspector also needs to be a witness audit: for example assisting internal inspection visit to evaluate the effectiveness. External inspectors compare the observations with internal inspection document and evaluate whether ICS meets the minimum requirements and have sufficient guarantee that the organic activity of farmers in accordance with he Farmer Team who has completed the corrective

actions of internal inspection may apply for a certification to the OCB through the Provincial Agriculture Office or be self-supporting. The mechanism of certification of OFS can be seen in Figure 2 (Director General of Food Crops, 2016). Description of grooves mechanisms of OFS are:

1. Business actors apply for certification to OCB
2. OCB appoint Tim Auditor (External)
3. Audit team conducted an audit adequacy and sampling audit to the certification applicant.
4. Tim Auditor present the results of its audit to the OCB
5. OCB submit audit results to the technical commission to be discussed in the technical Commission and make recommendations.
6. Technical Commission shall make recommendations to the OCB.
7. OCB present the results of the assessment, whether the applicant got the certification or not
8. OCB conducts periodic surveys.

**CONCLUSION**

It is known that sub-optimal land of tidal land for paddy soil is land that has not resulted in any food product the maximum because the land is very marginal, then to make

**REVIEW ARTICLE**

improvement to a thorough and accurate by following the rules of OFS it is not impossible the product resulting from tidal land can also be produced organic products that can be certified by OCB thus providing assurance of quality results that will provide high-value bargaining.

**REFERENCES**

- Anonymous. 2011. The Future of Organic Food business agriculture. [http://kesehatan,kompas.com/read/2009/12/17/13270290/Alasan,Memilih,Pangan.Organikhttp://www.dimonim.com/michael-samporna/pangan-organik-masa-depan-bisnis-agriculture/](http://kesehatan.kompas.com/read/2009/12/17/13270290/Alasan,Memilih,Pangan.Organikhttp://www.dimonim.com/michael-samporna/pangan-organik-masa-depan-bisnis-agriculture/). Accessed: July 27, 2011 (*in Indonesian*).
- Budianta, D. and Y. Windusari. 2016. Beneficial Effect of Local Resources to Improve Food Crop Production in Tidal Swamp of Indonesia. *Inter. Env & J Agric Res* 2 (1); 98-101.
- Directorate General of Food Crops. 2016. Technical Guidelines Facilitation Certification of Organic Agriculture. Jakarta 25 pages (*in Indonesian*),
- Eureka Foundation Website. 2009. Organic Food Products: Optimal untapped potential. <http://www.eurekaindonesia.org/produk-pangan-organik-potensi-yang-belum-tergarap-optimaal/dikutip> of <http://www.mbrio-food.com/articles.htm>. Accessed: July 26, 2011 (*in Indonesian*).
- Indonesian National Standard. ISO 6729: 2013 About Organic Farming Systems. National Standardization Agency, Jakarta, 64 p (*in Indonesian*).
- Lakitan, B., and N. Gofar. 2013. Technology Innovation Policy for Sustainable Land Management Sub-Optimal. Presented at the National Seminar on Land Sub Optimal, Palembang, September 20 to 21, 2013 (*in Indonesian*).
- Mayrowani, H. 2012. Development of Organic Agriculture in Indonesia. *Agro Economic Forum Penelitian* 30 (2): 91-108 (*in Indonesian*)
- Mirawati, N. 2011. Analysis of Revenues and Perceptions of Members of the Implementation of Internal Control System (ICS) on Organic Rice Farming, the Graduate School. Institute of Agriculture Bogor.79 page (*In Indonesian*).
- Mungara, E., D. Indradwa and R. Rogomulyo. 2013. Analysis of Growth and Rice Yield (*Oryza sativa* L.) Conventional, Organic Transitional and Organic Farming System. *Vegetalika* 2(3):1-12 (*in Indonesian*)
- Organic Farming Insurance Agency of Indonesia (Board of Indonesian Organic Certification / BIOCert) Newsletter, Ke edition III / Th.3 (September-October 2006). *Amarika States: Organic Food Market, Industry's Largest Organic As.* [http://biocert, or.id](http://biocert.or.id). Accessed July 25, 2011.
- Parlyna, R and Munawaroh. 2011. Organic Food Consumption: Improve Consumer Health. *Econo Sains* 9 (2): 157-167 (*in Indonesian*).
- Perbatakusuma, E.A., A. and P. Perangangin Damanik. 2009. Internal Control System Quality Organic Coffee: The implementation of the Cooperative Baperda Usulkan Organic. Paper presented at the meeting Strengthening Business Management and Internal Control System Traceability of Sustainable Coffee Beans on December 9, 2009 at Berriestera-Sidikalang. 15 p (*in Indonesian*).
- Regulation of the Minister of Agriculture of the Republic of Indonesia Number 64 / Permentan / OT.140 / 5/2013 About Organic Farming Systems. *News of the Republic of Indonesia* No. 770, 2013 (*in Indonesian*).

**REVIEW ARTICLE**

- Sarawa. 2014. Organic Farming On Land Sub Optimal. Unhalo Press, 115 p (*in Indonesian*).
- Sudirja, R. 2008. Sustainable Agricultural Development Based Organic Farming Systems. Paper presented at the Agricultural Extension, KKNM Unpad Sawit Villaget. Darangdan District, Purwakarta, August 7, 2008.
- Suhaimee, Sy, I.Z. Ibrahim and M.A.M.A. Wahab. 2016. Oragci Agriculture in Thailand. [Http://ap.fftc.agnet.org/files/ap\\_policy/579/579\\_1](http://ap.fftc.agnet.org/files/ap_policy/579/579_1.pdf) pdf (accessed, March 11, 2017)
- Syamsudin, T.S. and S. Aktaviyani. 2009. Application of Fertilization on Organic Rice Farming with Method System of Rice Intensification (SRI) in the village Sukakarsa Tasikmalaya regency. J. agroland 16 (1): 1-8 (*in Indonesian*).
- Training report. 2014. Internal Control System (ICS) For Farmers Group Subak Sustainable Mambal, Mambal village, 27 to 28 April, 2014 (*in Indonesian*).
- Win, H.I. 2016. Organic Agriculture in Thailand. [Http://ap.fftc.agnet.org/files/ap\\_policy/734/734\\_1](http://ap.fftc.agnet.org/files/ap_policy/734/734_1.pdf) pdf (accessed, March 11, 2017)