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# Socio-economic status of the self-regulating oil palm producers in Sultan Kudarat, Philippines

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**Abstract**
Oil palm plantations have contributed good economic and ecological benefits to the people and surrounding environment. This investigation concentrated on the assessment of socio-economic status of farmers in small, medium and large self-regulating oil palm plantations in Sultan Kudarat Province, Philippines. Site visit and consultation of environmental experts were observed in accordance to the flow of activities developed and modified by an expert. Key informant and personal interviews of purposively selected farmer respondents of the sample plantations were conducted. The study found out that the municipality of Isulan has the largest self-regulating oil palm plantation in the province. The current plantation practices were compared with good agricultural practices of the sustainable oil palm plantation. The small oil palm plantations had lower management performance than the medium and large plantations. The nutrient balances were not significantly different among oil palm plantations. The potential eutrophication of small oil palm plantation was higher than the medium and large plantations. Opportunities for trainings, seminars, and other pro-active farming activities should be available to farmers in order to advance their economic endeavors along with an environmentally sound and sustainable production system.

**Keywords:** Self-regulating palm oil producers, socio-economic condition, Sultan Kudarat

## 1. Introduction

Oil palm (*Elaeis guineensis*) production is gaining economic mileage in the Philippines. Environmental performance of an oil palm plantation is the effectiveness of plantation practices to manage its environmental aspects such as the kinds, rates and methods of fertilizer, and pesticide application without significant impacts. The management of the environmental issues is as essential as health and safety for effective business practice in the supply chain. This is a challenge for the self-regulating oil palm producers, which are the suppliers of the needed fresh fruit bunch to meet the capacity of existing palm oil mill capacity in Sultan Kudarat.

Oil palm production is gaining economic mileage in the Philippines. Particularly in Mindanao, about 17,000 ha of oil palm plantation has been established in the last 30 years and is projected to increase in the next ten years. This industrial crop is projected to play a significant role in attaining the government's objective to promote peace and order and uplift the standard of living of the people in the area. The Philippine Coconut Authority even projected this oil palm as a "tree of peace" that will promote socio-economic development in Mindanao [1]. Oil palm will not only contribute to vegetable oil industry in the Philippines but will also benefit the environment by playing a significant role in carbon sequestration. Oil palm plantations are 1.4 times more efficient than tropical rainforests in net $CO_2$ assimilation and can sequester as much as 15 metric tons of carbon per hectare per year [2].

The existing oil palm plantations in the Philippines are mostly company operated. In Mindanao, the three (3) huge palm oil plantations are operating about 13,400 ha. Small scale plantation is not being encouraged because of the volume of fresh fruit bunch production needed to operate a viable processing mill. The total area of plantation operated by KENRAM Philippines Incorporated is only about 1,600 ha while the small-scale plantations operated either by group of farmers or by individual farmers totaled 3,000 ha and only 5,239 ha are currently being operated by self-regulating oil palm producers. A processing plant to be viable needs to have at least 5,000 ha production area. Palm oil farming becomes a major source of livelihood for the rural families and generates employment opportunities.

The growing share of oil palm cultivated by self-regulating small holders represents a major achievement in Malaysia [3]. The crop offers the highest yields per hectare and lowest cost of production of all vegetable oils. It added a growing demand along with high prices, largely explain the boom of the last decades [4, 5]. Yet, Rubber Industry Smallholders Development authority (RISDA) programs encourage self-regulating rubber smallholders to integrate the cultivation of oil palm in their production systems in order to diversify livelihoods and increase income [6].

The production activities involved the use of fertilizer nutrient and pesticide has caused to increase chemical loading into water bodies and effects on: biodiversity, human, ecosystem health, and ecological services. These could threaten the ecological foundation of the life support system at the local, regional, national and global scales. The study has to characterize the socio-economic status of the self-regulating oil palm producers in Sultan Kudatat, Philippines and to determine significant material inputs of the different types of self-regulating oil palm producers;

The study is expected to contribute in providing benchmark information on production management systems of the self-regulating oil palm plantations in Southern Philippines and identify environmental performance indicators for small scale oil palm production. Results of this study might also be useful as decision support tool for policy makers in devising policies that will strategize development of best management practices for self-regulating oil palm plantations.

## 2. Materials and Methods

This study was conducted in the municipalities of Isulan, President Quirino, Lambayong and Esperanza and City of Tacurong in Sultan Kudarat Province. These sampling areas were considered because of its potentially big area for oil palm mass production. Sultan Kudarat is in the southwestern part of Mindanao geographically located in 7° 13' 44" North, 124° 15' 28" East. Oil palm is one of the promising high value commercial crops grown in the province with more than 4,500 ha planted with this plant species. The study adopted and modified the flow diagram of evaluation activities [7] but the socio-economic status of farmers in the three self-regulating oil palm plantations were only considered in this investigation. Checklists of their management activities were prepared and interview questionnaire was used. Key informant and formal interview were also conducted in the five oil palm producing municipalities. Stratification of the oil palm plantations and analyzing their environmental performance were considered. Using this instrument, the three categories of self-regulating oil palm plantations were established. The respondents were purposively selected and categorized according to size of the area tilled in hectares (ha) which comprised small (≤19 ha), medium (20-150 ha), and large (≥151) areas. The current plantation practices identified in the study were compared with good agricultural practices of the sustainable oil palm plantation observed [8].

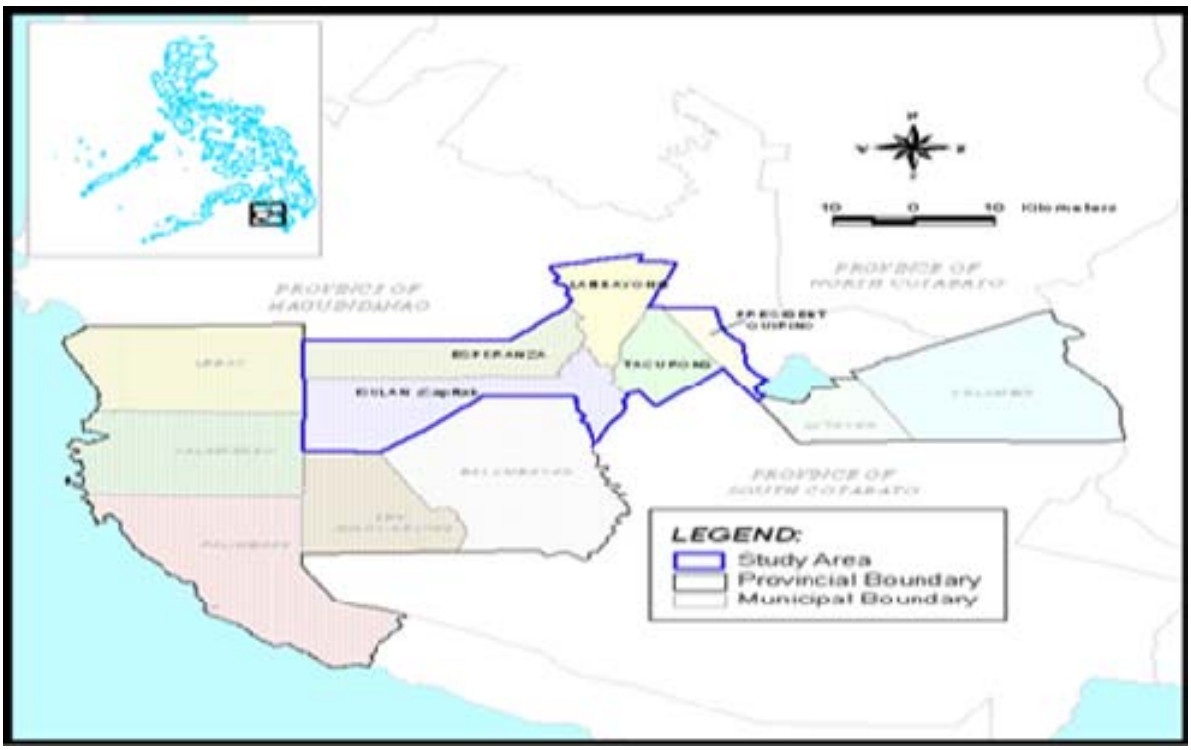


**Fig 1:** Location map of the study area [9].

## 3. Results and Discussion

The increasing demand of palm oil in business industries has become one of the stunning issues of Philippine Rural Development Project (PRDP). Mindanao is geographically located in the palm oil belt where Sultan Kudarat and other regions producing oil palm production are based.

**Table 1:** Location of self-regulating oil palm plantations of the respondents in Sultan Kudarat Province, Philippines.

| Location Of Plantations | Small Plantation (0-19 ha) | | Medium Plantation (20-150 ha) | | Large Plantation (>150 ha) | |
|---|---|---|---|---|---|---|
| | No. of Respondent (N=42) | Percent | No. of Respondent (N=10) | Percent | No. of Respondent (N=3) | Percent |
| Pres. Quirino | 15 | 35.71 | - | - | - | |
| Tacurong City | 5 | 11.90 | 6 | 60.00 | 2 | 66.67 |
| Isulan | 17 | 40.48 | - | - | 1 | 133.33 |
| Lambayong | 1 | 2.38 | 2 | 20.00 | - | - |
| Esperanza | 4 | 9.52 | 2 | 20.00 | - | - |

The location of the self-regulating oil palm plantations in Sultan Kudarat is presented in Table 1. Majority (32.72%) of the respondents operated small and large oil palm plantations dominantly in the municipality of Isulan. This municipality is believed to be a potential agent for plantation because it has rich soil suitable for this crop. This is geographically true as revealed in PRDP 2014 report that the area is in the oil palm belt where appropriate climate and soil conditions for the production of palm oil is observed. Monetary expenses in transacting and processing the crop is not really a problem

because KENRAM oil palm mill is located near the plantation areas. Perceived as a whole, the same report stressed SOCCSKSARGEN region where Isulan and other sampling areas situated, parted 64% of the hectarage estimation from 77% of 53,849 hectares of oil palm plantations in the country. However, this only constitutes 15% local oil palm production [10]. In order to supply the industrial needs, the remaining 85% amounted to $ 247,736,600 was imported in Malaysia and Indonesia [10]. With richness of land, climate, and soil conditions for the production of palm oil as cited in the recent report, Sultan Kudarat may serve as the solution to the rising demand of palm oil and importation problem in the country.

Factors like strategical location, transportation, pricing, milling, and marketing strategies might have influenced the self-regulating oil palm producers for crop cultivation within Isulan. In fact, KENRAM palm oil mill stationed in the said site which made transportation lesser in cost and is assiduous to higher marketable price. The municipality is also found as the largest agricultural land (49, 551 ha) efficient for this crop production followed by Lambayong (32, 482 ha), President Quirino (20, 858 ha), and Tacurong City has the smallest area with only 14, 924 ha total land area. The terrain of the Tacurong, however, is mostly plain with slope of 0-8%. The plain areas are drained by a number of streams and creeks.

The agricultural advantage to massive oil palm production is imperative for local authorities to set thorough planning and monitoring necessary for the formulation of acceptable policies to avoid possible personal and environmental problems such as land grabbing from local land owners and users [11], deforestation along creeks, rivers and water bodies in the study areas. Local or provincial government should consider notion that while intensifying these agricultural activities, the environment and biodiversity would not be adversely compromised and that a must for highest conservation concern [12] while enjoying economic stability. Pro-active steps to limit the negative biological and social impacts of industrial oil palm expansion [13] should be vividly perused when future expansion of oil palm plantation will be taken into deliberation since it might lead to rapid losses of biodiversity through forest habitat loss and fragmentation [14] and increased intensity of cutting of trees in the remaining areas which ecologically considered as buffer zone.

The demographic profile of the oil palm producers in the study sites is presented in Table 2. Majority of the farmer respondents (36.36%) aged 45-54 years old, 94.54% were male, and 41.81% were college graduate. They were almost in marginal age but still capable to do labor in the field and attend trainings and seminars relevant to sustainable oil palm production. They could still perform farm activities though they were slightly aged but had little opportunity for other source of income and at high risk for health illness. This means that age could attribute oil palm production since younger ones could finish various tasks than already aged, thus age contributed significantly for more production outputs [15, 16]. They added that male respondents were dominant and majority of them belonging in the same age range were still productive in their field operation. This suggests that respondents and local government have to encourage young individuals to obtain education relevant to this field since many were nearly aged and graduated not related to their present job.

**Table 2:** Demographic profile of the respondents from different self-regulating oil palm plantations in Sultan Kudarat.

| Demographic Characteristics | Small Plantation (0-19 ha) | | Medium Plantation (20-150 ha) | | Large Plantation (>150 ha) | |
|---|---|---|---|---|---|---|
| | No. of Respondent (N=42) | Percent | No. of Respondent (N=10) | Percent | No. of Respondent (N=3) | Percent |
| Age (year old) | | | | | | |
| 25-34 | 4 | 9.52 | 0 | 0 | 1 | 33.33 |
| 35-44 | 10 | 23.81 | 2 | 20.00 | 0 | 0 |
| 45-54 | 16 | 38.10 | 4 | 40.00 | 0 | 0 |
| 55-64 | 7 | 16.67 | 0 | 0 | 2 | 66.67 |
| 65-74 | 3 | 7.14 | 3 | 30.00 | 0 | 0 |
| 75-84 | 2 | 4.76 | 1 | 10.00 | 0 | 0 |
| Average Age | 51 | | 58 | | 48 | |
| Sex | | | | | | |
| Male | 41 | 97.62 | 9 | 90.00 | 2 | 66.67 |
| Female | 1 | 2.38 | 1 | 10.00 | 1 | 33.33 |
| Educational Attainment | | | | | | |
| Elementary | 14 | 33.33 | 0 | 0 | 1 | 33.33 |
| High School | 9 | 21.43 | 1 | 10.00 | 0 | 0 |
| College Level | 4 | 9.52 | 1 | 10.00 | 0 | 0 |
| College Graduate | 13 | 30.95 | 8 | 80.00 | 2 | 66.67 |
| Ph.D. | 2 | 4.76 | 0 | 0 | 0 | 0 |
| Mode | Elementary | | College Graduate | | College Graduate | |

The study also revealed that most (43.64%) of them had no other source of income (Table 3). They appear as dependents from oil palm farming only which turned them susceptible for economic failure especially when the plantation would not reap a good harvest. This holds similar findings [17, 18] stating many respondents considered oil palm farming as primary source of financial assistance. This condition exacerbates zero opportunity cost and the returns of investment would require higher cost of labor than profit. Another factor for this possible adverse circumstance would be their acquired baccalaureate program. They graduated in a course not actually related to the oil palm farming. This is quite alarming

because inconsistency of education and field of work would lead to probably misleading practices and actions. This would mean that unskilled farm holders would have greater chance to employ and test different methods in the farm and hire unskilled workers in the field which would pose high risk of health failure and environment degradation.

**Table 3:** Other sources of income of different self-regulating oil palm plantations.

| Other Sources Of Income | Small Plantation (0-19 Ha) | | Medium Plantation (20-150 Ha) | | Large Plantation (>150 Ha) | |
|---|---|---|---|---|---|---|
| | No. of Respondent (N=42) | Percent | No. of Respondent (N=10) | Percent | No. of Respondent (N=3) | Percent |
| Politician | 2 | 4.76 | - | - | - | - |
| Government Employee | 1 | 2.38 | - | - | - | - |
| Guard | 1 | 2.38 | - | - | - | - |
| Laborer | 8 | 19.05 | 4 | 40.00 | 1 | 33.33 |
| Maintenance worker | 0 | - | 2 | 20.00 | - | - |
| Police | 1 | 2.38 | - | - | - | - |
| Retiree | 5 | 11.90 | - | - | 1 | 33.33 |
| Sec. Guard | 1 | 2.38 | 1 | 10.00 | - | - |
| Secretary | 0 | - | 1 | 10.00 | - | - |
| Supervisor | 2 | 4.76 | 1 | 10.00 | - | - |
| None | 22 | 52.38 | 1 | 10.00 | 1 | 33.33 |

This investigation did not reveal an improved economic condition of the poor respondents but could not deny of some environmental problems. A hectare of productive oil palm will produce at least 20 tons of fresh fruit bunches, that would generate an annual waste of 1, 572 kg empty bunches, 420 kg fibers, 210 kg kernels, 1,038 kg sludge and 808 kg sludge condensate. These wastes are huge and need to be recycled and utilized before it becomes a major pollutant [19]. Further, habitat loss in the nearby areas might significantly exist and probably erode ecological processes [20]. Responsible agencies could intensify pro-active programs, seminars, trainings, and other related pro-active activities that would increase knowledge and skills of the farm holders in the maximization and sustainable production beneficial to the people and nearby communities including the environment.

As indicated in Table 4, almost half (47.27%) of the total farmer respondents attended the training on care and management of oil palm. This signifies their eagerness to learn on oil palm industry. However, this training would not suffice the overall management concern. They still need experts to assist them in different categories of management such as cooperative, production, and waste management Procedural methods on soil sampling, monitoring and evaluation, pruning, pest control, and the like could also provide further supplemental awareness. This would account enough knowledge of farmers in the proper oil palm management practices and impart this knowledge to their workers for the creation of possible income generating alternatives. Little background knowledge on managing oil palm would impair the plantation operation together with plantation goals and objectives.

**Table 4:** Trainings attended by respondents of different self-regulating oil palm plantations in Sultan Kudarat.

| Trainings Attended | Small Plantation (0-19 ha) | | Medium Plantation (20-150 ha) | | Large Plantation (>150 ha) | |
|---|---|---|---|---|---|---|
| | No. of Respondent (N=42) | Percent | No. of Respondent (N=10) | Percent | No. of Respondent (N=3) | Percent |
| Care and Management of oil palm | 16 | 38 | 8 | 70 | 2 | 66.6 |
| Pruning | 1 | 2 | 0 | 0 | 0 | 0 |
| Coop Management | 4 | 9.5 | 0 | 0 | 1 | 33.3 |
| Production Management | 3 | 7.1 | 0 | 0 | 1 | 33.3 |
| Monitoring and Evaluation System/Cooperative Development Authority (CDA) | 9 | 21 | 0 | 0 | 1 | 33.3 |
| Waste Management | 2 | 4.7 | 0 | 0 | 0 | 0 |
| Soil Sampling | 0 | 0 | 0 | 0 | 1 | 33.3 |
| Pest Control | 0 | 0 | 0 | 0 | 1 | 33.3 |

This scenario is prone to devastate maximum resources and neglect utilization value without benefiting the people. Adequate background on oil palm farming, various resources could be used to generate additional income such as integration of livestock, organic farming, and the same in the present farming condition leading to an increase of oil palm productivity yield [17]. The use of appropriate best practices for growing oil palms, limiting environmental impacts and protecting biodiversity, and responsible consideration of affected communities [21] should be considered in order to sustain future needs.

**Table 5:** Years of establishment of different self-regulating oil palm plantations in Sultan Kudarat.

| Year of Oil Palm Plantation Establishment | Small Plantation (0-19 Ha) | | Medium Plantation (20-150 Ha) | | Large Plantation (>150 Ha) | |
|---|---|---|---|---|---|---|
| | No. of Respondent (N=42) | Percent | No. of Respondent (N=10) | Percent | No. of Respondent (N=3) | Percent |
| 1970-1975 | 22 | 52.38 | 2 | 20.00 | 2 | 66.67 |
| 1976-1980 | 3 | 7.14 | 6 | 60.00 | 1 | 33.33 |
| 1981-1985 | 2 | 4.76 | 0 | - | - | - |
| 1986-1990 | 1 | 2.38 | 2 | 20.00 | - | - |
| 1991-1995 | - | - | - | - | - | - |
| 1995-2000 | 9 | 21.43 | - | - | - | - |
| 2001 to present | 5 | 11.90 | - | - | - | - |

A 2007 report indicated that Sultan Kudarat has still large potential areas for oil palm production [22]. However, minimal expansion took place in Sultan Kudarat starting 1976. Most (47.27%) of the existing oil palm plantations were established from 1970 to 1980 and that categorizes maturity of oil palm trees (Table 5). As referred to the maturity classification of [17], about more than half (74.75%) of all plantations have old palms while remaining percentage for mature palms. It is a good manifestation for capability of bearing fruit bunches responsible for higher profits leading to good maintenance of cost directed resources. But, it is observed from 1970 until 1995, abrupt change on the numbers of self-regulating plantations documented. It was the same condition in Indonesia where the oil palm plantations also experienced slow growth and stagnation [23].

Though small plantations added areas for oil palm, it overall resorted to diminishing land occupation in the later years. Reasons of this sudden condition cannot be specified but this might due to the probable result of poor management and lack of sufficient experience of the respondents. If these poor management and insufficiency of experience continue, the ecosystem, biodiversity, and humans will suffer perilously the consequences and thus environmental damage from oil palm development will continue to exaggerate [24]. Conversion and expansion plans brought interest for critical analysis upon fulfilling such actions because many researches cited negative impacts on natural habitats, biodiversity, and the global climate [25] which attribute rampant deforestation and failure to recognize biological and socio-economic importance [26].

**Table 6:** Membership in farmer's organizations of respondents of the different self-regulating oil palm plantations.

| Farm Organization | Small Plantation (0-19 Ha) | | Medium Plantation (20-150 Ha) | | Large Plantation (>150 Ha) | |
|---|---|---|---|---|---|---|
| | No. of Respondent (N=42) | Percent | No. of Respondent (N=10) | Percent | No. of Respondent (N=3) | Percent |
| Farmers Assoc./ Gintong Bukid | 0 | 0 | 1 | 10 | 0 | 0 |
| Central Cotabato Palm Growers | 4 | 9.52 | 0 | 0 | 0 | 0 |
| KARBEMPCO | 11 | 26.19 | 1 | 10 | 1 | 33.33 |
| MAPARBEMPCO | 5 | 11.90 | 0 | | 0 | 0 |
| UKARBEMPCO | 0 | 0 | 1 | 10 | 0 | 0 |
| NON MEMBER | 22 | 52.38 | 7 | 70 | 2 | 66.67 |

Few respondents have joined the cooperatives for marketing of their products according to some key informants. They claimed that pooling their products have enabled them to sell and bid for higher price. Also, it enables them to cut the unit cost of transporting their products. The cooperatives also assisted them in buying additional seedlings if they want to increase or establish oil palm farm, fertilizer and pesticide. Loan is also extended, and if ever there were trainings and seminars they can attend to such trainings related to oil palm and cooperative management systems.

However, many respondents (56.36%) of the self-regulating oil palm plantations in Sultan Kudarat were not members of farmers associations (Table 6). About 4,120 hectares were being cultivated but it is sad to note that membership to organizations is only few. This would imbue with little opportunity on acquiring knowledge on the innovation, advances of technology, and appropriate practices in the field. Conflicts between communities and companies would also arise such as competition on prices and benefits, technical support, territorial disputes, and others. This study stresses the relevance of leaders and farm organizations in helping the promotion of development initiatives to increase crop yield, raise funds, and protect their health from hazards and destruction. Authorities from relevant government agencies have to enhance the capacity and functioning of association because farm cooperatives play crucial roles in the realization of many benefits [23], stressing the importance of peoples' organization or cooperatives for the success of industry.

## 4. Conclusion

The majority of small and large plantations in Sultan Kudarat province is found in the municipality of Isulan which have operated since 1970. The study sites have a total land area of 117,815 ha cultivated mostly for oil palm plantation. A hectare of productive oil palm will produce at least 20 tons of fresh fruit bunches. The study area is in the oil palm belt where appropriate climate and soil conditions for the production of palm oil are observed. Most of the respondents were male, aged almost incapable for work, graduated tertiary education but not related to agriculture or oil palm farming. They have

had attended seminars and trainings but prioritizing care and management of oil palm farming only. Many of them had no other source of income aside from the current job and not a member of any farm organizations. Current knowledge on the field of work and experience revealed are not really enough to increment crop production and environmental management. Generally, the small oil palm plantations had lower management performance than the medium and large plantations. Monitoring and evaluation of existing plantations would be observed necessary for future action plans, improvements, and developments. Local authorities could help in the promotion of job opportunities and other income generating initiatives for the respondents to sustain their living. Males could be offered with work based on their production capability. Respondents and local government could train young individuals relevant to oil palm farming and different areas of oil palm management systems since several male respondents were already aged. They should invite experts who could hold trainings, seminars, and other related programs for the maximum utilization of manpower and natural resources without associating ill effects to humans and environment degradation. Future expansion of oil palm plantations should be carefully planned and examined in order not to compromise human health, environment, and biodiversity.

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