# DETERMINANTS OF AGRICULTURAL LAND USE INTENSITY AMONG SMALL SCALE ARABLE CROP FARMERS IN ORUK ANAM LOCAL GOVERNMENT AREA, AKWA IBOM STATE, NIGERIA

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## Abstract
The study identifies drivers of agricultural land intensity and analyzed farmers' perceived constraints to sustainable land management in Oruk Anam Local Government Area of Akwa Ibom State. Cross sectional data were collected from sampled arable crop farmers using structured questionnaire. Descriptive tools and regression analysis were employed to analyze the research objectives. Herfindhal index proxies agricultural land intensification of farmers. An average Herfindhal index of 0.4174 was obtained among farmers, implying that, the frequency of land use among farmers was moderate, but the intensity of cropping (number of crops planted per season) continuously increase. The empirical results revealed that, non-farm income, amount spent on labour, educational level of farmers, farming experience, farm size and poverty level of farmers were negative drivers of agricultural land use intensity among small scale arable crop farmers in the region. On the contrary, increase in fertilizer use, household size and farm output affected land use intensity positively. In addition, majority of farmers agreed that, land fragmentation, theft, prevalence of pests and diseases and poor cultivars of crops were the major environmental constraints militating against sustainable use of agricultural land by small scale arable crop farmers in the region. Similarly, majority of the farmers upheld that, high cost of farm inputs, transportation cost, and processing cost as well as fertilizer and manure costs were serious economic constraints to sustainable land use in the study area. Based on the findings, it is recommended that, governments of the region should intensify effort to provide adequate and accessible land through development of green fields and marginal lands in order to reduce unnecessary pressure on land. Fertilizer subsidy programme for small scale famers in the region is absolutely necessary if sustainable land use intensity is envisaged by government of the region.

**Key words:** land use, arable crop, crop intensity and farmers

## Introduction
Nigeria is currently faced with the problem of feeding the ever growing population and as the result of continuous food deficit, food imports have tended to flourish while the level of domestic food production and food self-sufficiency shrink (Akpan, 2012). The main factors undermining sufficient food production include excessive land fragmentation resulting to small land holding in the Southern region, low irrigation, low factor productivity, low fertilizer application, and a weak agricultural extension system among others (FAO, 2017). Following the persistent occurrence of these problems, the government at all tiers have set up several agencies, research institutes and other reforms as well restructuring of the economy in order to increase food supply among other objectives in the country (Akpan et al., 2012). The overall objective of these interventions has been to attain and maintained sustainable food production. But despite these lofty attempts by the Nigeria's government, the food supply has continuously fallen short of demand, implying that the agricultural intensification programmes conceived and implemented by various governments have not yielded the anticipated results. As pointed out by Idowu and Adeogun (1997), the objective of attaining sustainable agricultural production status in Nigeria cannot be achieved without adequate understanding of the drivers of intensity of cultivation or land use intensity. Literature has provided evidence of farmers' related factors, environmental factors, technological factors, edaphic factors and land ownership structure among others as some of the policy variable areas capable of causing positive and pragmatic impact on agricultural production intensification programmes especially in the sub-Saharan region of Africa (Dias et al., 2016).

Land being one of the factors of production is a critical input in agricultural production. The intensified used of land for agricultural purposes if not managed sustainably could lead to deterioration in soil fertility, declined in productivity, loss of soil structure, soil erosion and degradation (Erbaugh, 1999). Alternatively, if agricultural land is managed in a sustainable manner in combination with other factors of production and using appropriate technologies; then guaranteed sustainable food production is attainable. However, the intensity of land use in the Sub Saharan Africa is imposed by population pressure, urbanization process, excessive land fragmentation borne from poor land tenure structure prevalent in the region among others (Udoh and Akpan, 2011).

In Nigeria, due to the importance of land as a major factor of agricultural production, most agricultural policies and programmes were targeted at improving land quality and accessibility as well as maintaining a sustainable fertility status through provision of irrigation and land reclamation processes among others. In the Southern part of Nigeria, where the population density is high, accessed to agricultural lands depend largely on land tenure system and the extent of competition by non-agricultural land uses (Udoh 2000). Farmers devised ways to maximize potentials of farm land through land intensification achieved by adopting multi-cropping system and or continuous cultivation. For instance in Akwa Ibom State, due to the continuous increase in population density, availability of agricultural land has constituted a serious impediment to agricultural growth in the region. Small scale farming prevailed in the State due to excessive land fragmentation resulting from long held and cultural inclinations and faulty land tenure system.

Hence, given the peasant nature of farming in State and the fact that majority of farmers are resource-poor; government policies meant to achieve sustainable food production must consider those factors that influenced land use intensity of farmers in the rural areas. In addition, the evaluation of farmer's perceived socio economic and cultural constraints to sustainable use of agricultural land would helped to broaden the understanding of land use intensity and how to optimize resource use and achieve sustainable food production in the predominantly small scale and peasanticed farming system in the State. The findings generated in this study would provide policy makers with reliable tools to formulate appropriate and sustainable policy framework that would reduce the consequences derivable from continuous intensive use of agricultural lands and or achieve resource efficiency as well as optimum returns among small scale farmers in the State. Therefore the study fundamentally focused on the determinants of agricultural land use intensity among small scale crop farmers in Oruk Anam Local Government Area of Akwa Ibom State. It also analyzed farmers' perceived socio economic and cultural constraints to sustainable use of agricultural land in the study area.

## Methodology

### Study Area

This study was carried out in Oruk Anam Local Government Area of Akwa Ibom State. The Local Government Area is located in the Southern part of the State. It lies between latitude $4^{o}\ 40^{1}$N and $5^{o}$ N, and longitude $70^{o}\ 30^{1}$E and $70^{o}\ 50^{1}$E. It has a land mass of 511.73km sq. representing 7.23% of the State total land mass. The area comprises of two major political units, the Oruk zone and the Anam zone. It is characterized by a typically humid tropics climate with a distinct dry and wet season. The agricultural season lasts for up to 9 months. The mean annual rainfall is heavy and lies between 2000mm to 4000mm and has a temperature range of $26^{0}$C – $28^{0}$C. The rainy season lasts from March to November and it's characterized by high relative humidity and heavy cloud cover while the dry season last from December to February. Its inhabitants are mostly farmers, craft men and civil servants. The population of the local government is about 172,654 out of which males are 86,239 and females are 86,415 (NPC, 2006). Oruk Anam has common boundaries with Ukanafun and Abak in the north, Ikot Abasi in the south, Mkpat Enin in the East and in the West by Ukanafun and Imo River running through the borderline of Rivers and Abia state. It is predominantly agrarian with notable food crops like yam, cassava, cocoyam, maize, pumpkin, okra, melon, oil palm, plantain and banana.

**Sampling**

Following the work of Cochran (1963), a representative sample size from a large population of farmers in the study area was obtained using the equation (1) specified below:

$$S_n = \frac{z^2\rho(1-\rho)}{D^2} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Where $S_n$ is the required sample size; "Z" is the standard normal variate (at 95% confidence interval, type 1 error; 1.96). "P" is the expected proportion of farmers in the population (from the Agricultural Development Programme projection, about 95% of the population of the study area are farmers). "D" is the absolute error or precision at 5% type 1 error. The sample size is derived as shown in equation 2.

$$S_n = \frac{(1.96)^2 0.95(1-0.95)}{(0.05)^2} = 73 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

However, based on the distribution of villages, the study adopted proportional sampling method in the study area, hence a total of 100 (one hundred farmers) were used in the study.

Combination of sampling methods was used to select respondents in the study. The study area consisted of 9 clans (Inen, Obio Akpa, Ibesit Nung Ikot, Nung Ikot, Nung Ita, Ndot, Ibesit, Ekparakwa, and Abak/Midim). The first stage involved random selection of 5 out of the 9 clans in Oruk Anam. In the second stage, two villages were randomly selected from each clan. A total of 10 villages were used in the study. The third stage involved random selection of 10 arable crop farmers from each of the selected village. Then a total of 100 respondents were randomly selected and used in the study. Respondents were arable crop farmers engaged in sole cropping or and mixed cropping.

**Sources and Type of data**

Cross sectional data were collected from selected arable crop farmers in the study area. Data were collected using structured questionnaire and were complemented by personal interview to ensure consistency and accuracy of collected data.

**Analytical techniques**

Descriptive statistics which consisted of percentages, frequency count, tables, means and Herfindhal index were used to analyze data collected in line with the study's objectives. *The* Herfindhal index measures the degree of land intensification as follows:

$$Herfindahl\ index\ (HI) = \sum_{i=1}^{n}\left(\frac{Y_k}{Y_i}\right)^2 \ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where $Y_K$ is income from farm sources; $Y_i$ is total income of $i^{th}$ farmer. This index was estimated for each of the respondent. When the index approaches unity, it means that a farmer has intensified the use of his/her farmland. A perfect value of one (1) implies complete concentration or specialization or intensification in agricultural production whereas, value approaching zero implies increasing agricultural diversification or less specialization in agricultural activities. It also indicates increasing farmer's income from non-farm sources.

**Factors influencing agricultural land intensification among small scale farmers in the study area**

This objective was analyzed using multiple linear regression model based on ordinary Least Squares method. The model is explicitly shown thus:

$$HI = \emptyset_0 + \emptyset_1 AGE + \emptyset_2 NFI + \emptyset_3 LAB + \emptyset_4 EDU + \emptyset_5 GEN + \emptyset_6 EXT + \emptyset_7 EXP + \emptyset_8 FER + \emptyset_9 FAS + \emptyset_{10} HHS + \emptyset_{11} POV + \mu_i \ldots\ldots\ldots\ldots\ldots\ldots (4)$$

Where,

HI = Herfindhal index (An index representing land intensification as calculated in equation 3. It range from zero to unity)

AGE = Age of a farmer (years)

NFI = Non-farm income of $i^{th}$ farmer (Naira)

LAB = Amount spent on farm labour (Naira)

EDU = Educational level of farmers (years)

GEN = Gender of a farmer (1 for male and 0 for female)

EXT = Access to extension agent (Number of times)
EXP = Farming experience of farmers (Years)
FER = Fertilizer intensity (Kg/ha)
FAS = Farm size of farmers (ha)
HHS = Household size of farmers (Number)
POV = Household income below poverty line (Naira)
μ = Stochastic error term

**Identification of perceived factors militating against the sustainable use of agricultural land in the zone**

This objective was analyzed using five – point Likert scale. The identified perceived constraints in the literature were listed and their mean weights calculated and used to rank the extent to which each constraint affected sustainable used of arable cropland by farmers in the study area.

**Verification of Multicollinearity among Explanatory Variables used in the Analysis**

Multicollinearity is one of the commonest econometric problems of cross sectional data. This problem was verified to ensure the econometric stability and reliability of the regression estimates. The Variance Inflating Factor (VIF) was estimated and used to verify the presence of the multicollinearity. For VIF, the minimum possible value is 1.0; while value greater than 10 indicates a probably collinearity between the specified explanatory variable in question and the rest of the predictors in the model. According to Gujurati and Dawn, (2009), VIF is estimated using the formula stated below:

$$VIF_j = \{1/1 - R_j^2\} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Where $R_j^2$ represents the multiple correlation coefficient between one of the explanatory variable (designated as dependent variable) and the other specified explanatory variables in the study. The explicit model explaining the above process is shown in equation 6.

$$X_j = \varphi_0 + \varphi_1 X_1 + \varphi_2 X_2 + \cdots + \varphi_n X_n + \varepsilon_n \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

**Results and Discussion**

The summary of variables used in the analysis is shown in Table 1. The results contain the mean, minimum value, maximum value and standard deviation as well as the coefficient of variation. The finding revealed an average Herfindhal index of 0.42 and maximum as well as minimum indices of 0.96 and 0.07 respectively.

**Table 1: Socio-Economics Characteristics of Sampled Farmers in Oruk Anam**

| Variable | Mean | Min. | Max. | Std. Dev. | C.V |
|---|---|---|---|---|---|
| Herfindhal index | 0.42 | 0.07 | 0.96 | 0.23 | 0.55 |
| Age of farmers (years) | 44.26 | 20.00 | 63.00 | 10.41 | 0.24 |
| Non-farm income (Naira) | 55275.00 | 2500.00 | 210000.00 | 36484.50 | 0.66 |
| Labour (mandays/season) | 14329.00 | 4500.00 | 54500.00 | 7525.34 | 0.53 |
| Education (years) | 8.27 | 2.00 | 16.00 | 3.70 | 0.45 |
| Gender (number) | 0.31 | 0.00 | 1.00 | 0.46 | 1.50 |
| Extension visit (number) | 0.06 | 0.00 | 1.00 | 0.24 | 3.98 |
| Farm Experience (years) | 15.25 | 3.00 | 35.00 | 7.85 | 0.52 |
| Fertilizer used (Kg) | 57.37 | 0.00 | 200.00 | 45.00 | 0.78 |
| Farm size (ha) | 0.52 | 0.18 | 1.24 | 0.30 | 0.57 |
| Household size (number) | 6.14 | 1.00 | 9.00 | 1.93 | 0.31 |
| Poverty status (Naira) | 18552.80 | 0.00 | 68687.50 | 20692.10 | 1.12 |
| Output of arable crop (Kg) | 366.82 | 20.00 | 1418.00 | 282.36 | 0.77 |

**Source: Data from field survey, 2016**

**Test result for Multicollinearity**

Result in Table 2 presents the Variance Inflating Factor (VIF) estimates and tolerance factor test results used to test for the presence of multicollinearity among explanatory variables. The result reveals that

there was no serious or significant multicollinearity among explanatory variables in the specified model.

**Table 2: The Variance Inflation factors (VIF) test results**

| Variables | VIF estimates | Tolerance Factor |
|---|---|---|
| Age | 3.272 | 0.306 |
| Non-farm income | 1.692 | 0.591 |
| Labour cost | 2.021 | 0.495 |
| Education | 1.656 | 0.604 |
| Gender of farmers | 1.481 | 0.675 |
| Extension agent | 2.157 | 0.464 |
| Farming experience | 2.214 | 0.452 |
| Fertilizer usage | 1.117 | 0.895 |
| Farm size | 1.727 | 0.579 |
| Household size | 2.468 | 0.405 |
| Poverty Status | 1.526 | 0.655 |
| Farm output | 1.811 | 0.552 |

**Source: Computed by authors**

For instance, the estimated VIF with respect to each variable was greater than unity, but less than the threshold value of 10. The tolerance factor was also less than unity validating the VIF results. The result suggests that, the explanatory variables specified do not exhibit multicollinearity tendency. This implies that the regression estimates are consistent, best and efficient.

**Determinants of Agricultural Land Intensification among Farmers in the Study Area**

This objective was analyzed using multiple regressions based on Ordinary Least Squares Method. Table 3, presents the estimates of determinants of agricultural land intensification among small scale farmers in the study area. The diagnostic statistics revealed $R^2$ of 0.7111, which implies that, about 71.11% variations in Herfindhal indices is caused by the specified explanatory variables. The estimated F-cal. is about 31.904 and is significant at 1% probability level. This connotes that, the estimated $R^2$ is significant and the entire equation has goodness of fit. Also, the RESET test statistic is 35.302 and is statistically significant at 1% probability level. This result shows the adequacy of the specification and indicates that, the estimated equation has structural rigidity. The test for the normality of error term shows the estimated chi-square value of 8.466 that is statistically significant at 1% level. This however, justifies the use of Ordinary Least Squares estimation technique. In addition, the white test for heteroscedasticity (40.4864 is significant at 1%) affirmed the null hypothesis of no heteroscedasticity and further confirmed that, the OLS estimates are efficient.

The empirical results revealed that non-farm income, amount spent on labour, educational level of farmers, farming experience, farm size of farmers and poverty level of farmers have negative coefficients and are statistically significant at conventional probability levels. This implies that these variables have negative relationships with land intensification. This implies that a unit increase in non-farm income, amount spent on labour, educational level of farmers, farming experience, farm size of farmers and poverty level of farmers would cause a corresponding declined in land use intensification index among farmers in the study area. That is, as these explanatory variables increase, the rate of land intensification declined. For instance, a unit increase in non-farm income will increase the tendency of agricultural diversification, and hence reduce investment in agricultural production. A lot of factors are likely to be responsible for this result; for instance, the long gestation period and low yielding nature of most agricultural businesses would make non-farm investment a better option. Also, increase in household poverty rate will constrain input utilization in the farm, and this would retard land intensification. Similarly, increase in wages will lead to reduction in farm activities while aggravating the cost of production. This will reduce land use intensity by limiting the total land area meant for cultivation. The result for farming experience suggests that, farmers in the region are adaptive to modern technology and perhaps best farm practices following their continuous involvement in farming.

It seems they tend to adopt technologies that ease land use intensity and support increase yield. Increase in farming experience equally means increase in risk coping ability and increase in managerial skill of farmers among others.

**Table 3: Determinants of land intensification among small scale farmers in Oruk Anam LGA**

| Variable | Coefficient | Standard error | t-value |
|---|---|---|---|
| Constant | 0.5751 | 0.0809 | 7.1105*** |
| Age | 0.0016 | 0.0017 | 0.9340 |
| Non-farm income | −4.5713e-06 | 6.1087e-07 | −7.4832*** |
| Labour cost | −0.1691 | 0.0438 | −3.8603*** |
| Education | −0.0037 | 0.0013 | −2.7908** |
| Gender of farmers | −0.0506 | 0.0399 | −1.2682 |
| Extension agent | −0.0137 | 0.0562 | −0.2438 |
| Farming experience | −0.0065 | 0.0022 | −2.8820*** |
| Fertilizer usage | 5.4951e-05 | 3.2633e-05 | 1.6839* |
| Farm size | −0.1469 | 0.0489 | −3.0027*** |
| Household size | 0.0041 | 0.0017 | 2.3521* |
| Poverty Status | −0.7279 | 0.3373 | −2.1578* |
| Farm output | 0.0003 | 4.8795e-05 | 5.8870*** |
| **Diagnostic tests** | | | |
| R-squared | 0.7111 | Adjusted R-squared | 0.6713 |
| F(12, 87) | 31.9047 | Mean dependent var. | 0.4174 |
| Normality test | 8.4658** | Log-likelihood | 68.4752 |
| RESET test | 35.302*** | White's test | 40.4864*** |

**Source:** Data from Field Survey, 2016. Note *,** and *** represent Significant at 10%, 5% and 1% respectively

Increase in years of formal education is directly related to increase in non-farm business opportunities or agricultural diversification among farmers. Due to the low earnings from small scale farming, most educated farmers in the rural area abandoned farming and engaged in non-farm activities with higher anticipated returns. As a result of this, many hectarage of farm lands lay fallow or uncultivated in the rural areas and this has negative effect on land use intensity. The result for the farm size satisfies the priori expectation; because most rural farmers are resource poor, and so cannot afford expenditures involved in large scale farming. Hence, as farm land increase, farmers would be face with the option of reducing intensity of cultivation or land use in order to lower production expenditures and increase efficiency of production.

Increase in fertilizer use, household size and farm output increase the index of land use intensification among farmers in the study area. This connotes that, increase in the use of fertilizer and farm sizes are positive drivers of land intensification index among small scale farmers in the study area. Increase in fertilizer use would encourage increase in output, while increase in farm output will ensures economy of scale in farm production. All these incentives encourage continuous cropping and hence land intensification among respondents. The coefficient of household size also relate positively to index of land intensification among sampled farmers in the region. Reason for this result could be attributed to the subsistence nature of agriculture practiced in the study area. Literature has provided evidence that subsistence agriculture depends heavily on household labour. Hence the magnitude of land intensification will directly relate to the family labour needed for farm operations.

**Perceived Factors Militating against Sustainable use of Agricultural Land among Small scale Farmers**

The degree of constraints influencing sustainable use of agricultural land was estimated using 5 points likert scale. These constraints were subdivided into two groups, the environmental constraints and the socio economic and cultural constraints. The result presented in Table 4 revealed some perceived environmental constraints affecting sustainable land use in the study area.

**Table 4: Environmental constraints perceived to militate against sustainable use of Agricultural land in the area**

| Environmental constraints | Weighted mean | Inference |
|---|---|---|
| Poor yield | 1.45 | Disagree |
| Low soil fertility | 1.55 | Undecided |
| Soil erosion menace | 1.39 | Disagree |
| Land fragmentation | 2.86 | Agree |
| Theft | 2.79 | Agree |
| Pest and diseases | 2.75 | Agree |
| Low rainfall | 0.66 | Disagree |
| Long period of dryness | 0.61 | Disagree |
| Poor cultivars / species | 2.82 | Agree |

**Source: Field survey 2016**

As shown by the result, majority of respondents agreed that, land fragmentation and theft as well as prevalence of pests and diseases in addition to poor cultivars or species of crops and animals were major environmental constraints militating against sustainable use of agricultural land by small scale farmers in the study area. Reason could be that the land ownership system in the area does not permit majority of farmers to have full access to adequate land for cultivation. Also, prevalence of pest and diseases as well as theft could be as a result of insufficient chemicals and or pesticides for timely application by farmers as well as insufficient security at the farm. Another reason could be linked to insufficient sensitization and inefficiency of government agency saddled with the responsibility of disseminating agricultural information/technology to farmers especially on diseases and pests control. Theft in farms occurred mostly due to increase rural poverty and poor accessed roads to farming communities. The issues of poor cultivar or species have to do with low research outputs and or poor agricultural information dissemination between extension staff and farmers or among farmers themselves. This result implies that, social interactions or social capital formation among farmers is low in the study area.

The result also confirms that, low rainfall and long period of dryness were not perceived as significant constraints by farmers.

**Perceived Socio Economic and Cultural Constraints to Sustainable use of Agricultural Land in the study area**

Result in Table 5 presents the summary of the perceived socio-economic factors that hindered sustainable agricultural land use among farmers in the study area.

**Table 5: Socio economic and cultural constraints perceived to militate against sustainable use of agricultural land in the study area**

| Socio economic and cultural constraints | Weighted mean | Inference |
|---|---|---|
| Low regards for farmers | 1.37 | Disagree |
| Insufficient labour | 1.31 | Disagree |
| Low returns | 1.14 | Disagree |
| Strenuous nature of farm work | 2.37 | Undecided |
| Low demand | 1.37 | Disagree |
| Low output price | 1.62 | Undecided |
| High cost of farm inputs | 2.71 | Agree |
| Gluts in the market | 1.68 | Undecided |
| High cost of transportation | 2.52 | Agree |
| High cost of processing | 2.92 | Agree |
| High cost of fertilizer / manure | 3.05 | Agree |

**Source: Field, 2016**

Based on the result obtained in the field, the following documented constraints were not perceived by farmers as serious social and economic as well as cultural constraints militating against sustainable agricultural land use in the area. They are: low regards for farmers, insufficient labour and low returns on investment as well as low demand for agricultural commodities. The magnitude of the weighted mean showed that majority of sampled farmers rejected these options.

Possible reasons are that farmers in the area have accessed to hired labour but are very expensive, and have enjoyed improved returns from their farming investments due to minimal government subsidy on farm inputs. They were also of the opinion that demand was not a serious issue in the area but that supply was generally inadequate. The farmers were indifferent in their decision on the strenuous nature of farm work. They also expressed similar feeling about low output price and glut in the market.

On the contrary, farmers agreed that high cost of farm inputs is a serious economic constraint to sustainable farming activities in the region. In addition, high cost of transportation, high cost of processing and high cost of fertilizer and manure were all perceived as serious economic constraints to sustainable farming activities or land use in the study area. These costs would add significantly to the cost of production, and since majority of them are resource poor; it would be difficult to break even. High cost of transportation arose because of bad road network in most farming communities in the region.

**Conclusion**

This study has shown evidence of increasing pressure on land as a result of increased frequency of cultivation and high cropping intensity on arable crop farmlands in southern region of Nigeria. Based on the findings and the fact that land is critical in agricultural production, there is need to build profile of land use indices of famers in the region. There is also need to further investigate the conditions under which small scale arable crop farmers can optimize factor productivity and increase output in a sustainable manner in the region. It is also necessary to explore whether the prevailing land use pattern among farmers has the potential for the desired growth in the food sub sector of the region. In addition, the governments of the region should intensify effort to provide adequate and accessible land through development of green land/field and marginal lands in order to expand hectares of cultivable land, hence reducing unnecessary pressure on land. Also, there is an overwhelming need to provide farming population in the State with farm inputs such as fertilizer in order to encourage their usage. This strategy can help to minimize risks of crops loss, increase yield in the available land and reduce the level of land use intensification that might lead to soil degradation in the area.

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