

# UTILIZATION OF INTEGRATED FARMING SYSTEM (IFS) AMONG URBAN FARMERS IN ONA ARA LOCAL GOVERNMENT AREA OF OYO STATE

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## Abstract

*This study examined the utilization of integrated farming system (IFS) among urban farmers in Ona Ara Local Government area of Oyo state. Specifically, the study described the socio-economic characteristics of the respondents, ascertain whether urban farmers are aware of Integrated Farming System (IFS), examine whether the respondents utilized IFS, the level of utilization of IFS and constraints influencing utilization of IFS by farmers in the study area. Multistage sampling technique was used in selecting 120 arable crop farmers. Data were collected with the aid of well-structured interview schedule. Pearson Product Moment Correlation (PPMC) was used to test for the relationship between selected socio-economic characteristics and level of utilization of integrated farming system (IFS). The results showed that the mean age of the respondents was 40 years, 56.7% were married, the average farm size cultivated was 4 hectares and the mean household size was 6, while mean annual income was ₦72,458.70. Majority of the respondents were aware of integrated farming system (IFS) while majority of them utilized pigs and poultry production, fish farming, livestock production, vegetable farming and aquatic plants' production to feed fish and pigs, respectively as a form of IFS. In conclusion, severe constraints affecting the urban based farmers from utilizing IFS includes inadequate extension service on IFS, marketing constraints, and poor access to credit facilities in the study area. The result of PPMC showed significant relationship between age ( $r = 0.16, p < 0.05$ ), household size ( $r = 0.120, p < 0.05$ ), income ( $r = 0.281, p < 0.05$ ) exert a significant relationship with the utilization of IFS. Therefore, it is recommended that government and Non-governmental Organizations should invest massively in integrated farming and its utilization easy for the farmers. Also, Agricultural Extension specialist on IFS should be deployed to the study area to give necessary information to the farmers for effective utilization of Integrated farming system (IFS).*

**Keywords:** Integrated farming system (IFS); arable crop farmers and utilization.

## Introduction

An agricultural system is synthetic (man-made) system, embedded in the natural and social systems. It is defined as “an assemblage of components which are united by some form of interaction and interdependence” (Mc Connel *et al.*, 2017). There is consensus that agricultural research must move beyond the boundaries of disciplines, commodities, experimental farms and laboratories, and embrace system perspective (Bujarbarua, 2014). Confusion about the concept, apprehension regarding rigour and scientific validity, as well as organizational and operational rigidities perpetuates a status quo. An attempt is being made to introduce the concept of an agricultural and integrated farming system, narrate the Indian experience in this context, and offer some ideas on how to integrate the farming system perspective in the national research system. Raman, *et al.* (2012) postulated that farming System research is an

approach to agricultural research and development that view the whole farm as a system and focus on the interdependencies between the components under the control of members of the household and how these components interact with each other in respect of physical, biological and socioeconomic factors not under the household's control (Singh *et al.*, 2012).

The Integrated farming system of crop and livestock is one of the many technologies currently being developed in the sustainability of production system and increase farmer income. The Integrated farming system (IFS) aims to optimize the use of agricultural waste by extending the biological cycle (Guatan *et al.*, 2014). Each cycle chain produces a new product that has high economic value, so it can optimize the empowerment and use of marginal land in all areas. Thus, it is very important integrated farming systems as a solution to increase agricultural production (Collision, 2017). IFS are promising enterprise for the

marginal and small farmers, particularly those who have fewer farm holdings. From this study, the IFS provide progressive economic growth, employment opportunities, family nutritional requirements and optimal utilization of resources of the farming enterprises. Furthermore, many researchers found many types of integrated farming system models existing in the country but it has not properly documented to have reached the majority farmers. Hence, measures to be taken to document such kinds of farming system models and to disseminate to the needy farmers. Although the integrated farming system has certain constraints which the scientific community and research station has to initiate steps to alleviate such problems of the farmers to improve their standard of living and income (Mohanty *et al.*, 2012). IFS of crop and livestock are one of the many technologies currently being developed in the framework of sustainability of production system and increase farmer income. The Integrated farming system of maize and cattle is system integration without waste such that plant waste translates into fodder input, otherwise livestock waste used to fertilize crops (Dehadrai, 2018). The advantage of this model of integrated farming is the positive interaction between two or more commodities are combined (Dehadrai, 2018). In view of these, the following research questions were answered;

1. What are the socio-economic characteristics of the respondents?
2. Are the farmers aware of Integrated Farming System (IFS)?
3. Are the respondents able to utilized IFS in the study area?
4. What are the levels of utilization of IFS in the study area?
5. What are the constraints facing the utilization of IFS in the study area?

### Hypotheses of the study

The hypotheses of the study were stated in null form as follow:

HO<sub>1</sub>: There is no significant relationship between the socioeconomic characteristics of the respondents and their level of utilization of integrated farming system (IFS).

HO<sub>2</sub>: There is no significant relationship between awareness of integrated farming system (IFS) and level of utilization of IFS in the study area.

### Methodology

The study was carried out in Ona Ara Local Government Area of Oyo State. The Local

Government area share boundaries with Osun and Ogun State to the East, Ona Ara Local Government is dominated by the Yoruba's with a sizeable expanse of Land for the production of livestock and arable crops. The farming population is scattered all over the various communities in the local Government which include, Foworogun, Idi/ogun, Elese/Erin, Olosunde, Ojebode, Akanran and Gbada/Efon to mention just a few. Politically, the Local Government is in the front-line in Oyo State. The people of the Local Government are progressives who cherish truth and admonish uprightness. The political administration has raised the Local Government to its social and economic peaks, including the sighting of a dry seaport at Erunmu by the Federal Government. A multistage sampling technique was used to select 120 farmers. Stage I: Ten wards (10) in the study area were purposively selected, Stage II: Simple random sampling technique was used to select four (4) wards from the total wards that fell into urban areas and lastly, Stage III: Random selection of thirty (30) respondents from each ward making one hundred and twenty (120) respondents for this study.

### Results and discussion

Results in Table 1 shows that 61.7 percent of the respondents were between the ages ranged of 30-40 years, 17.5 percent were between 41-50years, 6.7 percent were between 51-60 years while 4.2 percent were above 60 years. The mean age is 40 years which implies that most of the respondents were at active and productive age and capable to carry out the task involved in integrated farming system. Furthermore, the tables revealed that majority (83.3 percent) of the respondents were male while only 16.7 percent were female. The findings showed majority of respondents sampled were male headed. This is in support of (Jibowo, 2000) who reported that men engaged more in farming activities than women in south-western Nigeria.

Furthermore, marital status, 56.7 percent of the respondents were married while 25.0 percent and 4.2 percent of them were single and widowed, respectively. The household size as shown in Table 1 revealed that 25.5 percent of the respondents have household size of less than 5. 66.7 percent have household size between 5-10 while 8.3 percent of the respondents have household of more than 10 members with mean household size of 6 persons.

The result also revealed that farming with 70.8 percent is the major occupation of the respondents, 75.0 percent cultivate less than 5 hectares, 15.8 percent cultivate between 5-10 hectares while 9.2 cultivate



less than 10 hectares of land for farming in the study area.

About 74.2 percent of the respondents had between ₦40,000-₦80,000 as their annual income from farming, 9.2 percent had above ₦80,000 as annual income from farming with mean annual income of ₦72,458.70. From the results, majority of the farmers

can still be categorized as low income earner. Furthermore, the result revealed that 63.3 percent had primary education, 25.0 percent had secondary education, and 8.3 percent had no formal education while very few 3.3 had Tertiary education in the study area.

**Table 1: Socio economic characteristics of the respondents (n = 120)**

| Variable                        | Frequency | Percentage | Mean       |
|---------------------------------|-----------|------------|------------|
| <b>Age;</b>                     |           |            |            |
| Less than 30                    | 12        | 10.0       | 40         |
| 30 - 40                         | 74        | 61.7       |            |
| 41 – 50                         | 21        | 17.5       |            |
| 51 – 60                         | 8         | 6.7        |            |
| Above 60                        | 5         | 4.2        |            |
| <b>Marital status;</b>          |           |            |            |
| Single                          | 30        | 25.0       |            |
| Married                         | 68        | 56.7       |            |
| Widowed                         | 5         | 4.2        |            |
| Divorced/Separated              | 17        | 14.2       |            |
| <b>Sex;</b>                     |           |            |            |
| Male                            | 100       | 83.3       |            |
| Female                          | 20        | 16.7       |            |
| <b>Primary Occupation;</b>      |           |            |            |
| Farming                         | 85        | 70.8       |            |
| Civil servant                   | 3         | 2.5        |            |
| Artisan                         | 12        | 10.0       |            |
| Trading                         | 20        | 16.7       |            |
| <b>Farm Size (Hectares);</b>    |           |            |            |
| >5                              | 90        | 75.0       | 4          |
| 5 – 10                          | 19        | 15.8       |            |
| <10                             | 11        | 9.2        |            |
| <b>Income from farming (₦);</b> |           |            |            |
| ≤40,000                         | 10        | 8.3        | ₦72,458.70 |
| 40000 – 80000                   | 89        | 74.2       |            |
| ≥80000                          | 11        | 9.2        |            |
| <b>Household size;</b>          |           |            |            |
| Less than 5                     | 30        | 25.0       | 6          |
| 5 – 10                          | 80        | 66.7       |            |
| Above 10                        | 10        | 8.3        |            |
| <b>Educational Level;</b>       |           |            |            |
| No formal                       | 10        | 8.3        |            |
| Primary                         | 76        | 63.3       |            |
| Secondary                       | 30        | 25.0       |            |
| Tertiary                        | 4         | 3.3        |            |
| <b>Religion;</b>                |           |            |            |
| Christianity                    | 120       | 100.0      |            |
| Islam                           | 37        | 30.8       |            |
| Traditional                     | 73        | 60.8       |            |
| <b>Total</b>                    | 120       | 100        |            |

Source: Field Survey, 2022

#### **Awareness of integrated farming system in the study area**

Table 2 revealed the distribution of respondents based on awareness of Integrated Farming System (IFS) by urban based farmers in the study area. The result showed 83.3 percent, 91.7 percent, 95.8 percent and

65.0 percent claimed to be aware of pigs and poultry production, fish farming and livestock production, livestock production and vegetable farming and Aquatic plants' production to feed fish and pigs respectively as a form of IFS in the study area while 54.2 percent, 41.0 percent and 45.8 percent of the



urban based farmers in the study area were not aware of tree crops/fruits cultivation and beekeeping production, Taungya system (Agro forestry and crop

production) and mushroom cultivation as a form of IFS respectively.

**Table 2: Distribution of arable crop farmers based on awareness of integrated farming system**

| S/N | Forms of Integrated Farming System                      | Yes  |      | No   |      |
|-----|---------------------------------------------------------|------|------|------|------|
|     |                                                         | Freq | %    | Freq | %    |
| 1   | Pigs and Poultry production                             | 100  | 83.3 | 20   | 16.7 |
| 2   | Fish farming and livestock production                   | 110  | 91.7 | 10   | 8.3  |
| 3   | Livestock production and vegetable farming              | 115  | 95.8 | 5    | 4.2  |
| 4   | Aquatic plants' production to feed fish and pigs        | 78   | 65.0 | 22   | 18.3 |
| 5   | Tree crops/fruits cultivation and beekeeping production | 55   | 45.8 | 65   | 54.2 |
| 6   | Taungya system (Agroforestry and crop production)       | 22   | 18.3 | 98   | 41.0 |
| 7   | Mushroom cultivation                                    | 65   | 54.2 | 55   | 45.8 |

Source: Field Survey, 2022

### Utilization of integrated farming system in the study area

Table 3 revealed the distribution of respondents based on utilization of integrated farming system (IFS) by urban based farmers in the study area was presented in Table 3. The result revealed that 45.8 percent, 95.8 percent, 95.8 percent and 16.7 percent utilized pigs and poultry production, fish farming and livestock production, livestock production and vegetable

farming and aquatic plants' production to feed fish and pigs respectively as a form of IFS in the study area while 41.7 percent, 41.0 percent and 95.8 percent of the urban based farmers in the study area claimed not to utilized tree crops/fruits cultivation and beekeeping production, Taungya system (Agroforestry and crop production) and mushroom cultivation as a form of IFS respectively.

**Table 3: Distribution of Arable crop farmers based on utilization of integrated farming system in the study area**

| S/N | Forms of Integrated Farming System                      | Yes  |      | No   |      |
|-----|---------------------------------------------------------|------|------|------|------|
|     |                                                         | Freq | %    | Freq | %    |
| 1   | Pigs and Poultry production                             | 55   | 45.8 | 65   | 54.2 |
| 2   | Fish farming and livestock production                   | 115  | 95.8 | 5    | 4.2  |
| 3   | Livestock production and vegetable farming              | 115  | 95.8 | 5    | 4.2  |
| 4   | Aquatic plants' production to feed fish and pigs        | 20   | 16.7 | 100  | 83.3 |
| 5   | Tree crops/fruits cultivation and beekeeping production | 70   | 58.3 | 50   | 41.7 |
| 6   | Taungya system (Agro forestry and crop production)      | 33   | 27.5 | 87   | 41.0 |
| 7   | Mushroom cultivation                                    | 5    | 4.2  | 115  | 95.8 |

Source: Field Survey, 2022

### Level of utilization of integrated farming system in the study area

Table 4 revealed the distribution of respondents based on level utilization of integrated farming system (IFS) by urban based farmers in the study area. The result revealed that 33.3 percent, 66.7 percent, 58.3 percent and 16.7 percent of the respondents frequently utilized pigs and poultry production, fish farming and livestock production, livestock production and vegetable farming and Aquatic plants' production to feed fish and pigs respectively as a form of IFS in the

study area. Also, 22.5 percent, 15.0 percent and 17.5 percent of the urban based farmers in the study area claimed to occasionally utilized tree crops/fruits cultivation and beekeeping production, Taungya system (Agro forestry and crop production) and mushroom cultivation as a form of IFS respectively while 8.3 percent, 4.2 percent and 27.5 percent didn't utilize livestock production and vegetable farming, fish farming and livestock production nor mushroom cultivation as a form of IFS in the study area.

**Table 4: Distribution of Arable crop farmers based on level of utilization of integrated farming system in the study area**

| S/N | Forms of Integrated Farming System                      | Frequently |      | Occasionally |      | Rarely |      | Not at all |      |
|-----|---------------------------------------------------------|------------|------|--------------|------|--------|------|------------|------|
|     |                                                         | Freq       | %    | Freq         | %    | Freq   | %    | Freq       | %    |
| 1   | Pigs and Poultry production                             | 40         | 33.3 | 40           | 33.3 | 35     | 29.2 | 5          | 4.2  |
| 2   | Fish farming and livestock production                   | 80         | 66.7 | 20           | 16.7 | 15     | 12.5 | 5          | 4.2  |
| 3   | Livestock production and vegetable farming              | 70         | 58.3 | 25           | 20.8 | 15     | 12.5 | 10         | 8.3  |
| 4   | Aquatic plants' production to feed fish and pigs        | 20         | 16.7 | 100          | 83.3 | 20     | 16.7 | 100        | 83.3 |
| 5   | Tree crops/fruits cultivation and beekeeping production | 15         | 12.5 | 27           | 22.5 | 53     | 44.2 | 25         | 20.8 |
| 6   | Taungya system (Agroforestry and crop production)       | 12         | 10.0 | 18           | 15.0 | 50     | 41.7 | 40         | 33.3 |
| 7   | Mushroom cultivation                                    | 33         | 27.5 | 21           | 17.5 | 33     | 27.5 | 33         | 27.5 |

Source: Field Survey, 2022

#### Constraint in utilizing of integrated farming system in the study area

Table 5 revealed the distribution of respondents based on constraints facing urban farmers in utilizing Integrated Farming System (IFS) in the study area. The result revealed that 55.8 percent, 66.7 percent and 79.2 percent of the respondents claimed market, financial and poor access to credit facilities are severe constraints affecting the utilization of IFS in the study

area respectively. Also, 8.3 percent, 20.8 percent and 18.3 percent of the respondents claimed that unavailability of farmland, awareness of IFS and climate issue are mild constraints in utilizing IFS in the study area respectively while 20.8 percent of the respondents claimed that lack of extension services of subject matter is not a constraint in utilizing IFS in the study area

**Table 5: Distribution of arable crop farmers based on constraint in utilizing of integrated farming system in the study area**

| S/N | Forms of Integrated Farming System               | Very Severe |      | Severe |      | Mild |      | Not a Constraint |      |
|-----|--------------------------------------------------|-------------|------|--------|------|------|------|------------------|------|
|     |                                                  | Freq        | %    | Freq   | %    | Freq | %    | Freq             | %    |
| 1   | Unavailability of farmland                       | 25          | 20.8 | 10     | 8.3  | 60   | 50.0 | 20               | 16.7 |
| 2   | Financial constraints                            | 80          | 66.7 | 20     | 16.7 | 15   | 12.5 | 5                | 4.2  |
| 3   | Poor access to credit facilities                 | 95          | 79.2 | 15     | 12.5 | 5    | 4.2  | 5                | 4.2  |
| 4   | Awareness situation of IFS                       | 10          | 8.3  | 25     | 20.8 | 10   | 8.3  | 75               | 62.5 |
| 5   | Lack of extension services of the subject matter | 15          | 12.5 | 27     | 22.5 | 53   | 44.2 | 25               | 20.8 |
| 6   | Climate issues                                   | 43          | 35.8 | 22     | 18.3 | 45   | 37.5 | 10               | 8.3  |
| 7   | Market constraints                               | 67          | 55.8 | 20     | 16.7 | 10   | 8.3  | 23               | 19.2 |

Source: Field Survey, 2022

#### Relationship between selected socio economic characteristics of the respondents and level of utilization of IFS (N=120)

Table 6 also revealed the test of significant relationship of between selected socioeconomic

characteristics (age, household size, income, farm size and farming experience) of the respondents and the level of utilization of IFS by the respondents was presented in Table 6. Pearson Production Moment Correlation analysis revealed that age ( $r = 0.16$ ,

$p < 0.05$ ), household size ( $r = 0.120$ ,  $p < 0.05$ ) and income ( $r = 0.281$ ,  $p < 0.05$ ) exert a significant relationship with the utilization of IFS in the study area. Therefore, the null hypothesis was rejected. The

result implies that an increase in age, household size, income, farm size and farming experience of the respondents will promote the level of utilization of IFS.

**Table 6: Summary of Pearson Product Moment Correlation analysis showing Relationship between selected socio economic characteristics of the respondents and level of utilization of IFS (N=120)**

| Socio-economic characteristics | r-value | p-value | Remark |
|--------------------------------|---------|---------|--------|
| Age                            | 0.116   | 0.021   | S      |
| Household Size                 | 0.120   | 0.021   | S      |
| Income                         | 0.281   | 0.020   | S      |
| Farm Size                      | 0.045   | 0.310   | NS     |
| Farming Experience             | 0.019   | 0.322   | NS     |

S = significant; NS = not significant

Source: Field Survey, 2022

#### Relationship between awareness of IFS and level of utilization of IFS in the study area

Result from table 7 revealed the test of significant relationship between awareness of IFS and level of utilization of IFS by urban based farmers in the study area was presented in Table 7. Pearson Product

Moment Correlation analysis revealed that there exist a significant relationship between them ( $r = 0.491$ ,  $p < 0.05$ ). Therefore, the null hypothesis was rejected. The result implies that increase in the awareness of integrated farming system (IFS) will promote the level of utilization of IFS in the study area.

**Table 7: Summary of Pearson Product Moment Correlation analysis showing relationship between awareness of IFS and level of utilization of IFS in the study area**

| Variable                                         | r-value | p-value | Remark |
|--------------------------------------------------|---------|---------|--------|
| Awareness of IFS and level of Utilization of IFS | 0.334   | 0.020   | S      |

S = significant; NS = not significant

Source: Field Survey, 2022

#### Conclusion and recommendations

The research concluded that majority of the respondents were male and married with mean age of 40 years and 6 members household with primary school education, the respondents were young, active and expected to be productive with the available resources in the study area. Majority of the respondents were aware of integrated farming system (IFS) while majority of them utilized pigs and poultry production, fish farming, livestock production, vegetable farming and aquatic plants' production to feed fish and pigs respectively as a form of IFS. In conclusion, severe constraints affecting the urban based farmers from utilizing IFS includes inadequate extension service on IFS, marketing constraints, and poor access to credit facilities in the study area.

Based on these findings, the following recommendations were made:

1. Both government and private sectors should invest massively in integrated farming system (IFS) to make it utilization easy for the farmers.
2. Agricultural Extension specialist on IFS should be deployed to the study area to give necessary information to the farmers for effective utilization of Integrated farming system (IFS).

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