# RESPONDENTS CHARACTERISTICS, THEIR AWARENESS AND BENEFITS OF SUKUR-WANUKI HILLS TO HOST COMMUNITY IN MADAGALI LOCAL GOVERNMENT AREA OF ADAMAWA STATE, NIGERIA

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***ABSTRACT***

*The conservation of biodiversity in Sukur–Wanuki hills requires information on the socio-economic characteristics, awareness of the existence of the hills and the benefits derived by the support zone dwellers from the study area, so that a lasting management plan can be developed. Investigation involved the administration of 300 questionnaires on the respondents to assess the socio-economic characteristics and to identify the economic benefits derived by the support zone dwellers from the hills as well as to evaluate the relationship between socio-economic factors and support zone dwellers awareness level of Sukur–Wanuki hills. Data on relationship between socio-economic factors and support zone dwellers awareness level was analysed using correlation while percentages were used for the presentation of the results on socio–economic characteristics and the benefits derived by the support zone dwellers. The result of investigation into the socio–economic characteristics of the respondents showed that the average monthly income across all the respondents that ranged from ₦12, 611.11 – ₦15, 736.11 was less than ₦18, 500.00 which is the Nigerian civil service minimum wage. The major values of the study area in order of utilization include provision of fuelwood (37.67%), sites for farming (30.0%) and animal grazing (29.0%). The correlation between education and awareness of the respondents of the existence of Sukur – Wanuki hills was negative (r= -0.038) at 0.05 level of significance, those of income and awareness (r=0.269**) as well as that of age and awareness (r=0.189**) were positive and highly significan at 0.05 level of significance. This study suggests provision of social amenities and the employment of the teaming youth among others will immensely help in diverting the attention of the support zone dwellers from the exploitation of the biological resources of Sukur-Wanuki hills.*

**Keywords**: Biological resources, dwellers, biodiversity, utilization, socio–economic factors, exploitation

## INTRODUCTION

The social and economic state of a man makes him a direct enemy of his environment as a result of the measures he adopts to ensure survival. The man's indiscriminate and unprecedented behaviour towards biological species in his vicinity, his culture, belief and the social code of conduct of human societies have serious impact on the biodiversity of the world. This means that the situation in Sukur–Wanuki hills is not different, because the Divisional Forestry Officer, DFO, Madagali,(2004) reported that the present human activity characterized by over–use of the biological resources has serious consequencies on the attempt made by the local government authority to conserve the biodiversity of Sukur–Wanuki hills, hence there is decline in species diversity and abundance at an alarming rate.

It is therefore obvious that there is need to investigate the awareness level of the support zone dwellers of the study area in respect of the values of the biological resources of Sukur–Wanuki hills before any meaningful decision can be made. Understanding the awareness level of the support zone dwellers of the existence of Sukur–Wanuki hills will help in evaluation of the relationship between the socio–economic factors of the support zone dwellers and the awareness level of the existence of the study area. The investigation into the awareness level and the evaluation of the socio–economic factors has become necessary because Margolius and Salasfky (1998) reported that those living closiest to any conservation project are the machineries use for the exploitation of the resources, especially biological resources because of the culture and believe that they are the putative owners of such resources an opinion shared with Andra (2001).

According to Andra (2001), adequate information on socio–economic factors of Sukur–Wanuki hills will be necessary in the development of a management plan for sustainable utilization. This is obvious because information on species richness, abundance and the structural characteristics of the biodiversity will be made available, which will then be used as a basis for decision making.

This study examined the effects of socio–economic factors on biodiversity and identified the benefits usually derived from Sukur–Wanuki hills.

## MATERIALS AND METHODS

### Study Area

Sukur-Wanuki Hills are located in Madagali Local Government Area of Adamawa State, Nigeria with an estimated area of 4900km$^2$. The local government area lies on longitude 16$^o$ 48$^1$ E and latitude 13$^o$ 24$^1$ N (Satumari, 2004). Vegetationally, it lies within the Sudan savanna region, with mean daily temperature ranging from 28–34$^o$C. The mean annual rainfall ranging from 700–900mm and wet season lasts for about 4–6 months (Toyo, 1996).

### Sampling Procedure

The study area was stratified into 5 units based on the valleys separating the hills; below is the details of each hill size, Mazhi (576m$^2$), Wakara (1,292m$^2$), Wanuki (588m$^2$), Wagul (1,404m$^2$) and Kirwu (1,040m$^2$). A total of 300 respondents (male and female) of 25 years and above comprising of farmers, hunters, traders and civil servants were drawn from a population of 890 people within the study area using simple random sampling technique as suggested by Jen (2002). The choice of age was to ensure that each of the respondents might have been old enough to be aware of the activities that took place in the study area for a minimum of 10 years.

### Data Collection

Information on the socio-economic characteristics, benefits of Sukur-Wanuki hills and awareness level of support zone dwellers on the existence of the hills were obtained using questionnaire in line with Arifalo (1984) and Conder (1996). The number of copies of questionnaire administered in each community was based on modified Cochran (1977) method of proportional allocation technique where nh was replaced by M and then Nh was replaced by h. The formular is stated as:

$$M = \frac{h \times n}{N}$$

Where

M = number of questionnaire administered in each community.

n = total number of questionnaire administered.

h = estimated population of the people in each community.

N = total number of people in all the communities.

**Table 1**: Details of Questionnaire Administered per Community

| Community | Estimated population of community (h) | Number of respondents in each community (M) | Percentage of respondents in each community |
|---|---|---|---|
| Wanuki | 190 | 64 | 33.68 |
| Mazhi | 173 | 58 | 33.53 |
| Wakara | 124 | 42 | 33.87 |
| Wagul | 157 | 53 | 33.76 |
| Kirwu | 246 | 83 | 33.74 |
| **Total** | **890 (N)** | **300 (n)** | |

The nature of questionnaire includes; Name of village, sex, age, occupation, educational qualification and annual income of respondents. Others are awareness of the existence of Sukur–Wanuki hills by the respondents and the benefits of Sukur – Wanuki hills to the support zone dwellers.

**Statistical Analysis**

Pearson correlation analysis was used for the evaluation of the relationship between socio–economic factors and awareness level of existence of Sukur–Wanuki hills by the support zone dwellers while percentage was used for presentation of results on the awareness level of Sukur–Wanuki hills by the support zone dwellers and identification of the benefits derived from the hills.

**RESULTS AND DISCUSSION**

**Socio–economic Characteristics**

The socio–economic characteristics examined include; age, occupation, educational qualification, estimated annual income, benefits derived from Sukur–Wanuki hills and the awareness level of the spport zone dwellers on the existence of Sukur–Wanuki hills.

**Age Classes of Respondents**

Table 2 shows the result of the age classes of respondents on community basis. In Wanuki, the percentage of respondents ranged from 8.33% in the class range of 51 – 55 years to 28.33% in 25 – 30 years. In Mazhi, the percentage ranged from 3.33% in the class of 56 – 60 years to 31.67% in 25 – 30 years. Similarly, Wakara had high percentages in the

age class of 25 – 30 years (38.33%), 41 – 45 years (16.67%, 31 – 35 years (13.33%) and 36 – 40 years (11.67%). The result of Wagul indicated that the highest percentage was recorded in the age class of 25 – 30 years with 30.0%, followed by 46 – 50 years (18.33%), 36 – 40 years (15.0%) and the least was recorded in 31 – 35 years with 4%. Also in Kirwu, the percentage ranged from 3.33% in the age class of 61 – 65 years to 17.0% in 25 – 30 years.

The polled result of Sukur-Wanuki hills also shows that the highest percentage of the respondents (31.33%) were in the age-class of 25 – 30 years, followed by age class of 46–50 years (14.67%) while the least were those of 61 – 65 years (1.33%). Furthermore, the analysed result shows that mean age of the age-class ranged from 38 – 39 years. The implication of the result (Table 2 below) is that more than half of the population was within the active age represented by an average of 56.67% (170 respondents) and therefore capable of exploiting the biological resources of the area beyond its resistance, hence this study confirms an earlier report made by Canter and Kamath (1995) that the cumulative effect of human interference on any habitat is responsible for its deterioration, which is the present situation in Sukur–Wanuki hills.

**Table 2:** Age Classes of Respondents

| Age class (years) | Wanuki | Mazhi | Wakara | Wagul | Kirwu | Total |
|---|---|---|---|---|---|---|
| 25 – 30 | 17 (28.33%) | 19 (31.67%) | 23 (38.33%) | 18 (30.0%) | 17 (28.33%) | 94(31.33%) |
| 31 – 35 | 6 (10.0%) | 15 (25.0%) | 8 (13.33%) | 4 (6.67%) | 10 (16.67%) | 43(14.33%) |
| 36 – 40 | 8 (13.33%) | 3 (5.0%) | 7 (11.67%) | 9 (15.0%) | 6 (10.0%) | 33(11.0%) |
| 41 – 45 | 11 (18.33%) | 6 (10.0%) | 10 (16.67%) | 6 (10.0%) | 8 (13.33%) | 41(13.67%) |
| 46 – 50 | 13 (21.67%) | 10 (16.67%) | 4 (6.67%) | 11 (18.33%) | 6 (10.0%) | 44(14.67%) |
| 51 – 55 | 5 (8.33%) | 5 (8.33%) | 2 (3.33%) | 7 (11.67%) | - | 19(6.33%) |
| 56 – 60 | - | 2 (3.33%) | 4 (6.67%) | 5 (8.33%) | 11 (13.33%) | 22(7.33%) |
| 61 – 65 | - | - | 2 (3.33%) | - | 2 (3.33%) | 4(1.33%) |
| Total | 60 | 60 | 60 | 60 | 60 | 300 |
| Mean | 39 | 38 | 38 | 40 | 40 | 39 |

**Source**: Field Survey (2014)

* Number outside parenthesis represents frequency of respondents

**Occupation of the Respondents**

Result of occupation of the respondents on community basis shows the range of sampled respondents recorded in each occupation (Table 3). In Wanuki, 60.0% were farmers, 36.67% were civil servants while only 2.33% were hunters. No trader was recorded in Wanuki community. In Mazhi, the record of occupation indicated farmers (68.33%), civil servants (26.67%), traders (5.0%) while no hunter was recorded in Mazhi. Similarly in Wakara, farming was recorded highest with 44 respondents representing 73.33% of the sampled respondents, followed by civil servants (20.0%) and the least was trading with only 1.67%.

The result of Wagul, indicated farmers (53.33%), followed by civil servants (40.0%), traders (6.67%) and no hunter was recorded. Also, Kirwu had 28 farmers representing 46.67% of the sampled respondents civil servants (43.33%), hunters (8.33%) and trading (1.67%) of the sampled respondents.

The polled result of Sukur-Wanuki hills revealed that the main occupation of the respondents is farming. The details show that 181 respondents were recorded as farmers representing 60.33% of the total respondents, followed by civil servants (100) representing 33.33% while hunting (10) and trading (9) represented 3.33% and 3.00% of the respondents respectively (Table 3). The result of this investigation is a clear evidence that the biological resources of Sukur–Wanuki hills is being exploited by the support zone dwellers as 191 respondents (farmers and traders) depend on the resources as an alternative source of income. The dependence of the support zone dwellers on the resources of Sukur–Wanuki hills as an alternative source of income is not unconnected with the economic state of the individuals as observed by Andra (2001) that the pattern of exploitation in rural populace is determined by the individual's annual income.

**Table 3:** Occupation of Respondents

| Occupation | Wanuki | Mazhi | Wakara | Wagul | Kirwu | Total |
|---|---|---|---|---|---|---|
| Farmers | 36 (60.0%) | 41 (68.33%) | 44 (73.33%) | 32 (53.33%) | 28 (46.67%) | 181(60.33%) |
| Hunters | 2 (3.33%) | - | 3 (5.0%) | - | 5 (8.33%) | 10(3.33%) |
| Civil servants | 22 (36.67%) | 16 (26.67%) | 12 (20.0%) | 24 (40.0%) | 26 (43.33%) | 100(33.33%) |
| Traders | - | 3 (5.0%) | 1 (1.67%) | 4 (6.67%) | 1 (1.67%) | 9 (3.0%) |
| Total | 60 | 60 | 60 | 60 | 60 | 300 |

Source: Field Survey (2014)

* Number outside parenthesis represents frequency of respondents

**Educational Qualification of Respondents**

Result of the educational qualification of the respondents on community basis is presented in Table 4. In Wanuki, 30.0% of the respondents had no formal education, 26.67% had secondary school education and 25.0% had tertiary education while only 18.33% of the sampled respondents had primary education. In Mazhi, the record showed 33.33% of the respondent had secondary school education, 19.0% tertiary school and 16.0% primary education while 25.0% had no formal education at all. The result of Wakara indicated no formal education (45.0%), primary school (23.33%), tertiary school (20.0%) and secondary school (11.67%). In Wagul hill, no formal education recorded the highest 33.33%, followed by tertiary school (26.67%), secondary school (25.0%) and primary (13.0%).

In Kirwa hill, the percentages of sampled respondents ranged from 3.33% for tertiary school, 21.67% for primary school, 33.33% for secondary education and 41.67% for no formal education. The polled result of the study area shows that 35.0% of respondents had no formal education, 17.67% had primary education, 26.0% were secondary school graduates while 21.33% graduated from various tertiary institutions. The implication of the findings (Table 4) is that majority of the respondents represented by 65.0% of the sampled respondents had formal education, hence creation of awareness among the support zone dwellers of the importance of the biological resources is easier as suggested by Gabun (1993) for a society that has high literacy level.

**Table 4:** Educational Qualification of Respondents

| Qualification | Wanuki | Mazhi | Wakara | Wagul | Kirwu | Total |
|---|---|---|---|---|---|---|
| No formal education | 18 (30.0%) | 15 (25.0%) | 27 (45.0%) | 20 (33.33%) | 25 (41.67%) | 105(35.0%) |
| Primary school | 11 (18.33%) | 6 (10.0%) | 14 (23.33%) | 9 (15.0%) | 13 (21.67%) | 53(17.67%) |
| Secondary school | 16 (26.67%) | 20 (33.33%) | 7 (11.67%) | 15 (25.0%) | 20 (33.33%) | 78(26.0%) |
| Tertiary | 15 (25.0%) | 19 (31.67%) | 12 (20.0%) | 16 (26.67%) | 2 (3.33%) | 64(21.33%) |
| Total | 60 | 60 | 60 | 60 | 60 | 300 |

**Source**: Field Survey (2014)

* Number outside parenthesis represents frequency of respondents

**Annual Income of Respondents**

The annual income of respondents on community basis (Table 5) revealed that in Wanuki, respondents that had their annual income ranging between ₦ 51, 000.00 – ₦100, 000.00 were highest with 28.33%, followed by ₦201, 000.00 – ₦ 250, 000.00 (23.33%) and the least were ₦301, 000.00 – ₦350, 000.00 and ₦351, 000.00 – ₦ 400, 000.00 with 1.67% each. In Mazhi, the respondents tend to be closely distributed across the income ranges except that no respondent was recorded for ₦351, 000.00 – ₦400, 000.00 annual income, although those that had their income between ₦101, 000.00 – ₦150, 000.00 with 21.67% were highest, followed by ₦201, 000.00 – ₦250, 000.00 (16.67%) and ₦151, 000.00 – ₦200, 000.00 (13.33%).

The result of Wakara indicates that 15.0% of the respondents had their income between ₦101, 000.00 – ₦150, 000.00, 16.67% for ₦51, 000.00 – ₦100, 000.00 while no respondent was recorded for annual income of ₦301, 000.00 – ₦350, 000.00. Similarly, in Wagul, respondents with income between ₦151, 000.00 – ₦200, 000.00 were highest with 21.67%, followed by ₦51,000.00 – ₦100,000.00 (20.0%) and then ₦1, 000.00 – ₦50, 000.00 and ₦201, 000.00 – ₦250, 000.00 with 15.0% each. No respondent was recorded for annual income between ₦351, 000.00 – ₦400, 000.00. Result in Kirwu, indicated that 26.67% of the respondents had an annual income of ₦201, 000.00 – ₦250, 000.00, followed by ₦51, 000:00 – ₦100, 000:00 with 23.33%. The result also shows that no respondent was recorded for annual income between ₦301, 000.00 – ₦450, 000.00.

The polled results of Sukur-Wanuki hills indicates that the percentage of respondents that earned between ₦ 51, 000.00 – ₦100, 000.00 and ₦201, 000.00 – ₦250, 000.00 were highest with each of them recording 19% of the total respondents sampled. This was followed by respondents that earned between ₦ 101, 000.00 – ₦150, 000.00 with 16%, followed by those that earned between ₦1, 000.00 – ₦50, 000.00 (13.67%) while only 1.33% of the respondents sampled were recorded to earn their annual income between ₦ 351, 000.0 – ₦ 400, 000.00. Furthermore, the analysed result shows that the mean annual income ranged from ₦151, 333.33 – ₦188, 833.33.

The findings in Table 5 is an indication that the support zone dwellers have to look for other alternative means of augumenting their income as the result revealed that the mean monthly income that range from ₦12, 611.11 – ₦15, 736.11 across all the sampled respondents of the study area is less than ₦18, 500.00 which is the minimum wage of a Nigerian civil servant. The low income of the support zone dwellers might have been responsible for the pattern of exploitation of Sukur–Wanuki hills, which confirms the earlier report made by DFO, Madagali (2004).

**Table 5:** Annual Income of Respondents

| Annaul income | Wanuki | Mazhi | Wakara | Wagul | Kirwu | Total |
|---|---|---|---|---|---|---|
| ₦1,000.00 – ₦ 50,000.00 | 8 (13.33%) | 11 (18.33%) | 6 (10.0%) | 9 (15.0%) | 7 (11.67%) | 41(13.67%) |
| ₦ 51,000.00 – ₦ 100,000.00 | 17 (28.33%) | 4 (6.67%) | 10 (16.67%) | 12 (20.0%) | 14 (23.33%) | 57(19.0%) |
| ₦ 101,000.00 – ₦ 150,000.00 | 2 (3.33%) | 13 (21.67%) | 15 (25.0%) | 8 (13.33%) | 10 (16.67%) | 48(16.0%) |
| ₦ 151,000.00 – ₦ 200,000.00 | 8 (13.33%) | 8 (13.33%) | 4 (6.67%) | 13 (21.67%) | 6 (10.0%) | 39(13.0%) |
| ₦ 201,000.00 – ₦ 250,000.00 | 14 (23.33%) | 10 (16.67%) | 8 (13.33%) | 9 (15.0%) | 16 (26.67%) | 57(19.0%) |
| ₦ 251,000.00 – ₦ 300,000.00 | 9 (15.0%) | 5 (8.33%) | 7 (11.67%) | 3 (5.0%) | 7 (11.67%) | 31(10.33%) |
| ₦ 301,000.00 – ₦ 350,000.00 | 1 (1.67%) | 6 (10.0%) | - | 5 (8.33%) | - | 12(4.0%) |
| ₦ 351,000.00 – ₦ 400,000.00 | 1 (1.67%) | - | 3 (5.0%) | - | - | 4(1.33%) |
| ₦ 401,000.00 – ₦ 450,000.00 | - | 3 (5.0%) | 7 (11.67%) | 1 (1.67%) | - | 11(3.67%) |
| Total | 60 | 60 | 60 | 60 | 60 | 300 |
| Mean Income (₦) | 157,991:67 | 174,658:33 | 188,833:33 | 155,500:00 | 151,333:33 | |

**Source**: Field Survey (2014)

* Number outside parenthesis represents frequency of respondents

**Respondents' Awareness of the Existence of Sukur – Wanuki hills**

Information on the awareness of respondents about the existence of Sukur-Wanuki hills is shown in Table 6. The result shows that those that were aware of the existence of the hills formed the majority (78.0%) of which the breakdown shows that 45 respondents representing 15.0% of the sampled respondents were females and 189 respondents representing 63.0% of the sampled respondents were males.

The result further shows that 66 respondents representing 22% of the sampled respondents

were not aware of the existence of Sukur-Wanuki hills, of which the breakdown shows 27 respondents representing 9.0% of the sampled respondents were females while 39 respondents representing 13.0% of the respondents were males. It is a clear indication in Table 7 below that the biological resources of Sukur–Wanuki hills is being utilized for one reason or the other as 234 respondents representing 78.0% of the sampled respondents were aware of the existence of Sukur–Wanuki hills. This result is expected as Bitcherman (1999) earlier observed that the awareness level of existence of a natural habitat is usually high among the local communities living closiest to it, as they are the machineries use for the exploitation of its resources. The outcome of this study is in line with Kessy (2003) that awareness level is usually high among people living closiest to any conservation site as they are primary users of its resources.

**Table 6:** Awareness of the existence of Sukur – Wanuki hills

| Awareness of existence of Sukur – Wanuki hills | Female | Male | Total |
|---|---|---|---|
| Aware | 45(15.0%) | 189(63.0%) | 234(78.0%) |
| Not aware | 27(9.0%) | 39(13.0%) | 66(22.0%) |
| Total | 72 (24%) | 228(76%) | 300(100%) |

**Source**: Field Survey (2014)

* Number outside parenthesis represents frequency of respondents

**Benefits Derived by Support Zone Dwellers**

The result of the investigation of the benefits derived by support zone dwellers of Sukur – Wanuki hills on community basis is presented in Table 7. In Wanuki, the utilization of the resources of the hill for fuelwood (48.33%), farming (46.67%) burial ground (26.67%) and thatch materials (20.0%) top the list. In Mazhi, the resources of the area provide fuelwood (45.0%), thatch materials (25.0%), farming and tourism with 21.67% each while timber 20.0%. Result of Wakara indicated that the study area provides bush meat (40.0%), fuelwood (35.0%), animal grazing (33.33%) and farming (31.67%) among others. The investigation in Wagul revealed that the resources of the study area were mainly used for fuelwood (30.0%), farming (28.33%), animal grazing (26.67%), medicinal herbs and bushmeat with 25.0% each. Similarly, in Kirwu hill, animal grazing is recorded highest with 53.33%, followed by fuelwood (30.0%), rocks for house and road construction (25.0%) and the least utilization is that it serves as boundaries (1.67%).

The polled result of Sukur–Wanuki hills are that fuelwood (37.67%), farming (30.00%), annual grazing (29.00%), thatch materials (20.00%) and bushmeat (19.33%) are the major benefits from the hills. Others include wildseeds and fruits (13.33%), tourism (11.67%) while the least is recreation/field laboratory (1.67%). That is why Kanya (2007) reported that there is need for every stratum of the society to consider conservation of natural resources especially biological resources as important as his existence.

**Table 7:** Benefits Derived by Support Zone Dwellers from Sukur-Wanuki Hills

| Benefits | Wanuki | Mazhi | Wakara | Wagul | Kirwu | Total |
|---|---|---|---|---|---|---|
| Timber | 7 (11.67%) | 12 (20.0%) | 5 (8.33%) | 6 (10.0%) | 8 (13.33%) | 38 (12.67%) |
| Wooden motor | - | - | - | 10 (16.67%) | 7 (11.67%) | 17 (5.67%) |
| Animal grazing | 11 (18.33%) | 8 (13.33%) | 20 (33.33%) | 16 (26.67%) | 32(53.33 %) | 87 (29.0%) |
| Farming | 28 (43.75%) | 13 (21.67%) | 19 (31.67%) | 17 (28.33%) | 13 (21.67) | 90 (30.0%) |
| Fuelwood | 29 (45.31%) | 27 (45.0%) | 21 (35.0%) | 18 (30.0%) | 18 (30.0%) | 113(37.67 %) |
| Fishing sites | 10 (16.67%) | | 13 (21.67%) | - | - | 23 (7.67%) |
| Bushmeat | 3 (5.0%) | 8 (13.33%) | 24 (40.0%) | 15 (25.0%) | 8 (13.33%) | 58 (19.33%) |
| Wildseeds and fruits | 6 (10.0%) | 11 (18.33%) | 8 (13.33%) | 12 (20.0%) | 3 (5.0%) | 40 (13.33%) |
| Thatch materials | 12 (18.75 %) | 15 (25.0%) | 10 (16.67%) | 13 (21.67%) | 10(16.67 %) | 60 (20.0%) |
| Source of employment | 3 (5.0%) | 6 (10.0%) | 4 (6.67%) | 2 (3.33%) | 12 (20.0%) | 27 (9.0%) |
| Rope | 6 (10.0%) | - | 4 (6.67%) | 8 (13.33%) | - | 18(6.0%) |
| Tourism | 10 (16.67%) | 13 (21.67%) | - | 9 (15.0%) | 3 (5.0%) | 35 (11.67%) |
| Ritual site | 1 (1.67%) | 5 (8.33%) | - | 4 (6.67%) | 7 (11.67%) | 17(5.67%) |
| Medicinal herbs | - | - | - | 15(25.0%) | 4 (6.67%) | 19(6.33%) |
| Recreation/ Field laboratory | 2 (3.33%) | 8 (13.33%) | 1 (1.67%) | 1 (1.67%) | - | 12 (4.0%) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Sources of water | 9 (15.0) | - | 5 (8.33%) | 5(8.33%) | - | 19 (6.33%) |
| Rocks for house and road construction | 6 (10.0%) | - | - | - | 15 (25.0%) | 21 (7.0%) |
| Defence against enemies in olden days | 4 (6.67%) | - | - | 7(11.67%) | 3(5.0%) | 14 (4.67%) |
| Serve as Boundaries | 7 (11.67%) | 2 (3.33%) | 4 (6.67%) | 6 (10.0%) | 1 (1.67%) | 20 (6.67%) |
| Burial ground /grave yard | 16 (26.67%) | - | 3 (5.0%) | 5 (8.33%) | 9 (15.0%) | 33 (11.0%) |

**Source**: Field Survey (2014)

* Number outside parenthesis represents frequency of respondents

**The Relationship between some Socio-economic Factors of Respondents and Awareness of Sukur-Wanuki hills**

Correlation analysis of the relationship between respondents' education and their awareness of the existence of Sukur-Wanuki hills was done using Pearson correlation.The result showed that a negative correlation (-0.038) exists between education and awareness of the existence of Sukur-Wanuki hills at 0.01 level of significance (Table 8). This implies that higher literacy level has nothing to do with awareness of Sukur-Wanuki hills among the support zone dwellers.

The correlation analysis of the relationship between respondents' income and their awareness of Sukur-Wanuki hills indicated that a highly significant and positive correlation (0.269**) exist between respondents' income and awareness of Sukur-Wanuki hills. Similarly, the result of the correlation analysis of the relationship between respondents' age and the awareness of Sukur-Wanuki hills showed a positive relationship (0.189**) which is highly significant at 0.01 level of significance.

The implication of the result (Table 8) is that income and age may be determinants of awareness of the existence of the hills while education does not. This is expected, since the higher the utilization of the resources of the hills the higher the income of the respondents. In the same vane, the older the respondents, the more likely they would have utilized the hills. Besides, the result agrees with Bitcherman (1999) report that with increasing age, the level of awareness of the environment within which one lives also increases. This finding perhaps accounts for the indiscriminate use and over-exploitation of the resources of the hills.

**Table 8:** Correlation between Respondents' Education, Income, Age and Awareness of Existence of Sukur-Wanuki Hills

| Parameter | Awareness of existence of Sukur – Wanuki Hills P value (r) | Confidence level | Significance |
|---|---|---|---|
| Education | - 0.038 | 0.05 | Not Significant |
| Income | 0.269** | 0.05 | Highly Significant |
| Age | 0.189** | 0.05 | Highly Significant |

**Conclusion**

The socio-economic characteristic indices of the support zone dwellers as they appear presently are not favourable to conservation of biological resources on the hills. What is required is an immediate transformation of the socio-economic setting of the area through provision of cottage industries, credit facilities and skills that will divert economic activities from the hills to other economic ventures.

Similarly, the high level of awareness of the existence of Sukur–Wanuki hills is an indication that the conservation of the study area is possible, what is required is a high level of conservation education for every stratum of the population as well as provision of socio-economic infrastructure such as roads, electricity, pipe-borne water, schools and hospitals that would improve on their living standard and generate support of the members of the local communities towards the conservation of Sukur–.Wanuki hills. Besides, the participation of the local people in both policy formulation and daily management of the hills will go a long way towards securing their interest and support for the project.

It is expected that these information will be useful for preparation of a management plan for the conservation of Sukur-Wanuki hills. In general, this study has provided baseline information on the socio-economic characteristics of the support zone dwellers, the values of the hills to the people and the awareness level of the support zone dwellers on the existence of Sukur–Wanuki hills.

The present research suggests that there is need to develop sustainable management strategies to conserve the biological resources of Sukur–Wanuki hills. Similarly, the problems of socio–economic characteristics of the support zone dwellers should be properly addressed in order to conserve the biological resources of Sukur–Wanuki hills.

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