THE UTILIZATION OF FISHING OPERATIONAL METHODS ON ADULT LEARNERS’ ECONOMIC LIVELIHOOD FOR POVERTY REDUCTION IN BAYELSA STATE

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ABSTRACT

This paper examined the utilization of knowledge by adult learners on different methods/techniques of fishing operations in the livelihood activities of migrant fisher folks for poverty reduction. The random sampling method was adopted to select 2004 adult learners and a questionnaire was designed as instrument for data collection. The questionnaire was analyzed using mean and Pearson Product Moment Coefficient. The result indicated that knowledge acquired on the curriculum of the migrant fisher-folk education enhances the ability of adult learners to improve upon their fishing profession to sustain their socio-economic livelihood. It is therefore recommended that the Agency for adult and non-formal education should intensify the education of adult learners on the various fishing methods/techniques to increase their level of income for self-sustainability and reduction of poverty in the fishing communities of Bayelsa State.

Key Words: Education, Curriculum, Basket, Net, Traps, Trawlers, Aqua-Culture

Introduction

The understanding of the act and science of fisheries operation is an important element in the development of fishing activities. By fishing activities, it involves the processes and procedures by which fish is caught in its habitat. In Nigeria, fishing activities according to Eheazu (1989) in Ezewu and Tahir (1997) are carried out mainly in two broad categories which are the artisanal (traditional) and industrial fishing. The successful operation of any fishing category depends on the type of fish, knowledge of the fishermen and the use of appropriate fishing implements. Similarly, the methods and technique employed by the fisherman, the gear or its modification is designed to bait a particular fish or group of species in their habitat.

In Bayelsa State, the type of fishing gears according to Otobo (1995) ranged from mere use of sticks, hand and simple baskets to complex traps, long lines and those constructed from synthetic netting materials. These implements according to Sikoki and Ototobekere in Alagoa (1999) are used in coastal marine in the brackish water and artisanal inshore areas for various livelihood activities.

The understanding of the various methods/techniques of fishing by adult learners’ is essential to effectively utilize their potentials to enhance the productivity of their fishing profession. This will help to boost their economic livelihood in the fishing areas. The term economic livelihood according to Krantz (2001) and Kobayashi (2004) comprises the competencies, assets (stores, resources, claims and access) and activities required for a means of living. Therefore, the use of one or combination of the various methods/techniques of fishing by adult learners is bound to promote their occupation and means of livelihood which will help to raise their level of income to reduce poverty in the fishing communities.

In the curriculum of the National Commission for Nomadic Education NCNC (2002) the content of the migrant fisher folk education specified how adult learners should be able to read and identify different fish species. It examined the preparation of some gears needed to carry out various
fishing expedition in upland and riverine areas. The curriculum also considered how knowledge of some methods/techniques of fishing will assist adult learners to advance the livelihood activities of their profession. These methods/techniques are examined as follows:

**Use of Baskets**
In this method of fishing, baskets are sourced from materials locally woven from cane sticks into either rectangular or oval shape. They are used in creeks, streams or rivers depending on the location of the fisherman. The device is specially made and placed under water weeds and as fishes swim in, it is suddenly raised for water to drain off and the fishes left behind are caught. The understanding of this fishing device by adult learners is aided by the use of pictures, specimen and practical demonstration to reinforce the degree of comprehension. The technique on the use of baskets as a device in fishing is common in the entire Niger Delta area.

**Use of Hooks and Lines**
This method explained how a hook is tied to a long stick and a bait like smaller fish or earth worm is used to attract a bigger one. The technique explained the process whereby when the bigger fish is trying to eat the bait, it will hook its mouth and is caught by the hook. According to Sikoki and Otobotekere in Alagoa (1999), some hooks and lines are operated by trigger mechanism and are selective of fish size. The use of hook and line is prevalent in Bayelsa State in the salt and freshwater zones.

**Use of Net**
This technique explained the materials used for net making which includes threads, wire or bamboo with different mesh size for the fish that is meant to catch (Erebor 2003). This method of fishing involves keeping the net inside the river at a suitable point and as the fish swim into it, they are trapped. Erebor further identified that there are different types of net such as scoop net, gill net, drag net, cast net and so on. The knowledge about the use of different nets by the fisher-folk creates awareness to expand their capabilities in their occupation. This is made possible since the subject matter exposed them on how to apply the use of various types of nets at their disposal.

**Use of Traps**
In this method of fishing, a trap is designed like a bird cage for the capture of fishes on spawning migration. It involves the use of bait which is placed inside the cage to lure the fish until it is caught by the fishermen. Traps are used in different ways depending on the locality, season and target of fish species. Sikoki and Otobotekere in Alagoa (1999) explain that traps vary in sizes ranging from very small purse like device to large equipments of over 2m in length and 1m wide. Traps may be baited or un-baited and re-used beyond a particular season. Sikoki and Otobotekere (1999) asserted that some traps are selective of fish size while others are not. The non-selective traps are destructive to juvenile fishes returning from breeding grounds. The knowledge of traps is helpful to adult learners in understanding best practices in handling traps that could be destructive to juvenile fishes. Apart from that, knowledge of fish traps exposes the fisher-folk to different devices of fishing for an increase fishing activities.

**Organization of Aqua Culture**

This is a method of fishing which involves the artificial construction of water for production of fish, shrimps and other aquatic animals. In this method, adult learners are exposed to the practical steps in artificial pond construction. The exposure may involve field visit and excursion to already existing farms in order to gain practical knowledge about pond construction. Learners are taught the basic characteristics and the features of aqua culture which Erebor (2003) enumerates as (i) site selection (2) surveying and construction of dam and trench (3) pond fertilization and liming (4) stocking and the maintenance of the fish pond. The subject matter of the curriculum draws attention of learners to harvesting of farm proceeds and marketing outlets. It also exposes learners to avenue where they can raise capital and seek input support either to start or expand their fish business enterprise. The content discusses the difficulty encountered by fish farmers in setting up fish farm holders and proffer solutions through practical knowledge and experience.

**Organization Pond Draining and Lake Fishing**

This method is employed by constructing a pond in the swamp at a strategic location suitable during the movement of fishes. During dry seasons, the whole water is drained either manually with buckets or draining machines. Scoop nets can then be used to catch all the fish. Similarly, naturally occurring lakes are done with the same procedure. Sometimes, pond draining and fishing in lakes are used as events for fishing festivals which might involve everyone and other neighboring communities.

**Use of Fences and Stakes**
Fencing and staking is a method of fishing used independently or with fish traps or lift nets. It is prepared from local forest materials and set across
water courses in the shore to serve as fish barriers. Its use according to Sikoki and Ototbekere (1999) is to enclose fish shelters in shallow waters before removing fish with scoop nets. Fences and stakes are constructed in water bodies in the delta areas but are mostly channel during floodplain at the receding or ebbing of waters. The knowledge on the uses of stakes and fences makes adult learners have a better understanding about the river geography which helps in their occupation. It makes learners organize themselves into group fishing activities either as family members or at the community level.

**Use of Trawlers**

This is a method of commercial farming involving the use of big fishing company usually in deep sea (Erebor 2003). The use of fish trawlers has the capacity of catching large fishes and of different sizes. The establishment of the Bayelsa Sea Foods Company Ltd by the state government offers opportunity to some fishermen to be involved in commercial fishing activities in the state. This has helped to create job opportunity and also made available the supply of fish in various quarters of the state.

The understanding of these basic methods and technique employed in fishing is bound to result in active participation of adult learners in their livelihood activities. The knowledge will increase the ability of the fisher-folk to adopt different approaches and strategies in their businesses. It will also assist learners in the maintenance of their fishing equipment and tools. In this way, the volume of fish catches and level of productivity will be significantly enhanced to raise their level of income.

**Use of Explosive Devices**

Another technique or method adopted in fisheries operation is the use of explosives that could easily result to irreversible damage to aquatic habitat and the ecosystem. According to Wikipedia (2011), this fishing practice involves the use of dynamite or homemade bombs from locally sourced materials to blast the fishes which are easily killed. During the process, fishes are killed by the shock from the blast and are then skimmed from the surface or collected from the bottom.

The use of explosive technique often kills a large number of fish and other marine organisms indiscriminately. This can damage or destroy the physical environment through pollution. The use of explosive is particularly harmful and the use of blast fishing is illegal in many waterways around the world. In Nigeria, fisheries regulation according to Erebor (2003), has banned the use of chemical and explosives as they are non selective in killing fishes.

In spite of the prohibition, some unscrupulous fishermen are still indulging in the unwholesome practice by using explosives in the act of fishing expeditions.

**Problem of the study**

One of the objectives of the migrant fisher-folk education in Nigeria is to provide adult learners with knowledge and skills to enhance their fishing profession in the riverine areas of the country. This is to facilitate their understanding about modern methods/techniques of fish farming for immediate application to real life situation to increase their economic livelihood which will help to reduce poverty.

In Bayelsa State, it is observed that many adult learners and those residing in the riverine communities still practiced their fishing occupation with obsolete knowledge and out-dated techniques through their traditional approaches. The curriculum of the migrant fisher-folk education it is hoped would help adult learners to adopt new fishing methods/techniques needed to improve their wellbeing and help themselves in their communities through their primary occupation. The need therefore arose to examine the various fishing methods/techniques in the curriculum of the migrant fisher-folk education on adult learners’ in their livelihood activities for poverty reduction in the fishing communities of Bayelsa State. To attain this need is the problem of this study.

**Purpose of the Study**

The specific purposes of this study include to:

i. Examine the relationship between the knowledge of adult learners on the various methods/techniques of fish farming in the migrant fisher-folk education and their livelihood activities in the fishing communities;

ii. Assess the level of adult learners’ participation in their livelihood activities that brings about poverty reduction in the migrant fishing communities.

**Research Questions**

The following research questions guided the study.

i. Does knowledge derived from various methods/techniques of fishing assist adult learners in activities that enhances economic livelihood in the fishing communities?

ii. Does the participation of adult learners in the activities of economic livelihood
null hypothesis

There is no significant relationship between knowledge derived from the methods of fish farming and economic livelihood that leads to the poverty reduction of adult learners.

significance of the study

The significance of this study is to provide insight for the National Commission for Nomadic Education and the Agency for Adult and Non-formal Education to implement the policies and programs of the migrant fisher-folk education to the adult learners in the country. The study will provide baseline data to enhance educational services to migrant learners to effectively participate in livelihood activities which promotes the reduction of poverty.

methodology

The descriptive research design was used in carrying out this study. This design seeks to find out the conditions or relationship that exist, opinion that are held, processes that are going on, effects that are evident or trends that are developing (Asika 2001, Akuezuzulo and Agu 1993). The design was used to unravel the relationship of the variables of the method/technique of fishing in the migrant fisher-folk education and adult learners’ livelihood activities which helps to reduce poverty in the migrant fishing communities.

results

Research Question 1

Does knowledge derived from various methods/techniques of fish farming assist adult learners in activities that enhance economic livelihood in the fishing communities?

Table 1 Mean analysis of methods/techniques of fish farming and adult learners’ in activities of economic livelihood in fishing communities

<table>
<thead>
<tr>
<th>S/N</th>
<th>Items</th>
<th>4(SA)</th>
<th>3(A)</th>
<th>2(D)</th>
<th>1(SD)</th>
<th>Total</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Knowledge of Adult literacy programme has assisted learners to understand different uses of baskets, traps, fences and stakes in their fishing occupation.</td>
<td>297 (1188)</td>
<td>727 (2181)</td>
<td>643 (1286)</td>
<td>83 (83)</td>
<td>1750</td>
<td>2.71</td>
</tr>
<tr>
<td>2</td>
<td>Knowledge gained about organizing pond draining and lake fishing increase the volume of fish harvest.</td>
<td>284 (1136)</td>
<td>806 (2418)</td>
<td>580 (1160)</td>
<td>80 (80)</td>
<td>1750</td>
<td>2.74</td>
</tr>
<tr>
<td>3</td>
<td>Knowledge gained on the dangers of chemicals and use of explosive has helped in safeguarding the environment and rivers from pollution.</td>
<td>300 (1200)</td>
<td>795 (2385)</td>
<td>589 (1178)</td>
<td>66 (66)</td>
<td>1750</td>
<td>2.76</td>
</tr>
<tr>
<td>4</td>
<td>Knowledge in the preparation of modern fishing nets and hook and line has empowered the fisher folks to be more productive.</td>
<td>287 (1148)</td>
<td>844 (2532)</td>
<td>553 (1106)</td>
<td>66 (66)</td>
<td>1750</td>
<td>2.77</td>
</tr>
</tbody>
</table>
Knowledge acquired in aquaculture and fishing trawler has provided employment opportunities for the fisher folks in the community.

<table>
<thead>
<tr>
<th>S/N</th>
<th>Items</th>
<th>4(SA)</th>
<th>3(A)</th>
<th>2(D)</th>
<th>1(SD)</th>
<th>Total</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Uses of different fishing techniques helps to increase the volume of fish harvest to generate more income among the fisher folks.</td>
<td>318 (1148)</td>
<td>844 (2532)</td>
<td>553 (1106)</td>
<td>66 (66)</td>
<td>1750 (4911)</td>
<td>2.81</td>
</tr>
</tbody>
</table>

Grand Mean = 2.50

The data presented in Table 1, indicates that all the item mean scores of 2.71, 2.74, 2.76, 2.77 and 2.81 are respectively greater than the criterion mean of 2.50. The Grand mean of 2.76 is greater than the criterion mean implying a positive response.

On the whole, the respondents therefore acknowledged that knowledge of various methods/technique of fish farming enhances the relationship of adult learners’ in the drive for poverty reduction.

In order to ascertain if this relationship is significant, the mean scores are subjected to the analysis of Pearson Product Mean Correlation Coefficient (See Table 3)

Research Question 2:
Does the participation of adult learners in the activities of economic livelihood bring about the reduction of poverty in the migrant fishing communities?

Table 2: Mean analysis of adult learners in the activities of economic livelihood that leads to poverty reduction in migrant fishing communities

<table>
<thead>
<tr>
<th>S/N</th>
<th>Items</th>
<th>4(SA)</th>
<th>3(A)</th>
<th>2(D)</th>
<th>1(SD)</th>
<th>Total</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Uses of different fishing techniques helps to increase the volume of fish harvest to generate more income among the fisher folks.</td>
<td>42 (168)</td>
<td>180 (540)</td>
<td>805 (1610)</td>
<td>723 (723)</td>
<td>1750 (3041)</td>
<td>1.74</td>
</tr>
<tr>
<td>7</td>
<td>Income realized from fishing operation is diversified to other self help activities to expand our fishing activities for self sustenance.</td>
<td>37 (148)</td>
<td>183 (549)</td>
<td>810 (1620)</td>
<td>720 (720)</td>
<td>1750 (3037)</td>
<td>1.74</td>
</tr>
<tr>
<td>8</td>
<td>The practices of different fishing methods have assisted the fisher folks to device and acquire several vocational skills of making fishing gears.</td>
<td>36 (144)</td>
<td>175 (525)</td>
<td>745 (1490)</td>
<td>794 (794)</td>
<td>1750 (2953)</td>
<td>1.69</td>
</tr>
<tr>
<td>9</td>
<td>Vocational skills acquired by the fisher folks provided opportunity for empowerment to raise their living standard.</td>
<td>43 (172)</td>
<td>141 (423)</td>
<td>743 (1486)</td>
<td>823 (823)</td>
<td>1750 (2904)</td>
<td>1.66</td>
</tr>
<tr>
<td>10</td>
<td>Awareness on the dangers of chemicals and explosives for fishing has helped to preserve the environment and the rivers from pollution.</td>
<td>38 (152)</td>
<td>142 (426)</td>
<td>729 (1458)</td>
<td>841 (841)</td>
<td>1750 (2877)</td>
<td>1.64</td>
</tr>
<tr>
<td>11</td>
<td>The use of different methods/techniques of fishing has provided opportunity for the availability of fish for household consumption.</td>
<td>39 (156)</td>
<td>137 (411)</td>
<td>746 (1492)</td>
<td>828 (828)</td>
<td>1750 (2887)</td>
<td>1.65</td>
</tr>
<tr>
<td>12</td>
<td>The procurement of fishing</td>
<td>43</td>
<td>143</td>
<td>745</td>
<td>819</td>
<td>1750</td>
<td>1.65</td>
</tr>
</tbody>
</table>
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The practice of fishing occupation has afforded the fisher folks opportunity to form cooperative societies to help one another.

The fisher folk use cooperative societies to mobilizing themselves to seek subsidies from government to boost their occupation and social status to reduce the level of poverty.

Grand Mean

<table>
<thead>
<tr>
<th>Variables</th>
<th>∑xi</th>
<th>y</th>
<th>Df</th>
<th>r-cal</th>
<th>r-crit</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge on the Methods of Fish</td>
<td>24114</td>
<td>349148</td>
<td>426081</td>
<td>1748</td>
<td>0.446</td>
<td>0.195</td>
</tr>
<tr>
<td>Farming</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Livelihood Activities for Poverty</td>
<td>29874</td>
<td>572158</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reduction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*significant at 0.05 alpha level, N=1750

As shown in Table 3, that the calculated r-value of 0.446 is greater than the critical r-value of 0.195 at 0.05 alpha levels with 1748 degrees of freedom. Therefore, the null hypothesis which states that there is no significant relationship between knowledge derived from the methods of fish farming and economic livelihood of adult learners that leads to poverty reduction is rejected. The alternative hypothesis which states that there is significant relationship between knowledge derived from the methods of fish farming and economic livelihood of adult learners that leads to poverty reduction is upheld.

Discussion

The findings from research question one in Table 1, indicated that there is no significant relationship between knowledge derived from the methods/techniques of fish farming and adult learners economic activities that brings about the reduction of poverty in the migrant fishing communities. It is also indicated from hypothesis one on table 3 that a positive relationship of 0.446 exist between the
knowledge derived from the methods/techniques of fish farming and the economic livelihood activities of adult learners that brings about reduction of poverty in the fishing communities.

The findings of this study are in agreement with Eheazu (1996) and Fregene (n.d) who in their separate studies, observed that artisanal or traditional fishing accounts for a greater proportion of fish produced and that the decision for a fisherman to move to an under-exploited fishery is the art and use of modern equipment thereby leading to high economic rent in return of their skills. For example, Ezeomah (1992) maintained that literacy skills acquired by migrant fishermen will enable them to apply scientific and technological knowledge to improve their income generation through diversification of their economic mainstay thereby contributing to poverty reduction.

The findings of the study also indicated that acquisition of knowledge on different methods/techniques of fishing is helpful in advancing fishing activities among the fisher folks. The grand mean (2.76) on Table 1 is above the criterion mean (2.50) suggesting that knowledge of the various items promotes fishing activities which will go a long way to increase the volume of fish caught by the fisher folks. A good knowledge of group fishing and pond draining for instance, could encourage fisher folks in the formation of cooperative societies which Jim-ogbolo Ogbolo (1991) identify as avenue to pool resources together for self-help. In a similar vein, the use of dangerous chemicals and explosive in seen by the respondent as harmful practices which Erebor (2003) says is prohibited to avoid non selection of fishes that is killed indiscriminately.

However, the findings of this study are at variance with results of the Nigerian Agriculture Sector Analysis (2007) who reported that fishery in Nigeria is still low, mainly at small-scale and the demand for fish is certainly larger than the total production from domestic sources. This result indicated that even though adult learners are quite knowledgeable on modern methods/techniques of fish farming they still depend on those traditional approaches of fishing to earn their economic livelihood in the fishing areas. Apart from this, Arikawei (2012) observed that the Bayelsa Sea Food Company Ltd established by the State government in 2008 expected to use the services of fisher folks who are knowledgeable on the various fishing methods for large scale commercial fishing has stopped operations and abandoned over the years. As a result, the hope of fisher-folks in utilizing improved knowledge and technical-know-how to improve the quality of their fishes to raise their standard of living is far from being realized.

Conclusion/Implications

Based on the findings, the study concluded that the acquisition of basic knowledge by adult learners on the methods and techniques of fish farming has significant relationship in activities that leads to the means of survival by migrant fisher folks. This implies that the effective utilization of basic knowledge on the methods/techniques of fish farming strengthens the participation of adult learners in various livelihood activities which brings about improvement in the quality of life in the fishing areas.

Recommendations

It is therefore recommended that:

i. The National Commission for Nomadic Education and the Bayelsa State Agency for Adult and Non-Formal Education should ensure the mobilization of all potential adult learners in the fishing areas to acquire knowledge on modern methods and techniques of fish farming. This will expose them to better skills and technical know-how to exploit the fisheries resources to enhance their living standard and contribute to the reduction of poverty in the fishing areas.

ii. There should be enlightenment campaign to educate the fisher folks on the dangers of using chemical and other explosives in fishing to reduce the pollution of rivers to sustain the flora and fauna of the environment.

iii. The fishing trawlers and industry established by the Bayelsa State Government should be revitalized to go into large scale fish production to maintain the availability of fish supply to the consumers.

iv. The fish industry should employ the services of the migrant fisher-folks who are knowledgeable in modern art of fishing. This will spur adult learners to put more interest in adult education to acquire sellable skills for their
empowerment and self-reliance in the fishing settlements.

v. The fisher folks should organize themselves into different cooperative groups to pull their resources together and seek government assistance to boost their fishing profession to reduce level of poverty in the fishing communities.

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