The scale **Journal Website:** https://thescalejournal.com.ng/
An Interdisciplinary Journal of
The ACADEMIC STAFF UNION OF POLYTECHNICS - ZONE D
ISSN: 2992-3727 Published 30th November, 2025

ECONOMIC AND AGE DETERMINANTS OF OCCUPATIONAL HEALTH PROBLEMS ASSOCIATED WITH COASTAL FISHING IN RIVERS STATE

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Abstract

The research examined economic and age determinants of occupational health problems associated with coastal fishing in Rivers State. This study was guided by two objectives and two research questions with two hypotheses tested. The work used cross-sectional descriptive research design. The population of coastal artisanal fishermen association member was 2,051 with a sample of 410 drawn. Multistage sampling procedure was used in the study. The instrument for the study was validated, structured questionnaire with reliability coefficient of 0.87. The data were analyzed with descriptive statistics of percentage, mean, and standard deviation used for the research questions, while the inferential statistics of point biserial correlation at 0.05 confidence level was used for the hypotheses. Findings were economic factor (2.82±0.59), and age (2.57±0.50) constituted determinants of occupational health problems to high extent. The paper thus recommended that Nigeria Maritime Administration and Safety Agency enforce compliance to guidelines required on safety precautions in fishing, the Gulf of Guinea States should jointly set up a monitoring and action group preventing distant fleet from fishing at locations reserved for coastal artisanal fishermen operation to enable them have enough catches and meet their financial obligations, coastal artisanal fishermen should seek and apply other alternatives with cost-effective better methods for fish preservation and increased revenue yield to enable them buy canoes of durable woods and service any loan procured, and older coastal artisanal fishermen should start early to embrace training in alternative, less strenuous trades to avoid being left with no means of livelihood.

Keywords: Age, determinants, occupational health problems, economic factor

Introduction

In our world, human being continues to seek diverse means of livelihood. Consequently, there exist different occupations for man to explore. Mankind had existed for ages as a hunter and food gatherer. Fishing by hunting for the required ones is thus an ancient occupation (Olapade et al., 2021). It has since grown to be a source of food, livelihood, and of cultural significance. Many nations bordering large bodies of water like big rivers, seas and oceans have coastal fishing as part of the means of revenue earning for most of their citizens. Fishing is the catching of fish by any methods directly or indirectly using some gadgets. Direct method involves use of such active gears as net casting, sharp penetrating objects like typical spears and metallic wire with specialized gadgets for electrocuting and sharp machetes (when in very shallow waters). There is also bare-hand catching of fish especially in streams, shallow rivers and ponds. Indirect method includes use of nets, non-net passive gears with other means for trapping the fish in their natural paths as well as use of hooks and other items with

baits from various objects. Anton and Curtis (2017) had informed that equipment for fishing varies by region and included fixed nets, drift nets, seine nets, long line and cast nets. The broad-sweeping fishing mechanism like gillnets and bottom trawls incidentally catch other sea creatures (bycatch) that are not the fisheries target (Open Farm-pet Blog News, 2018).

Occupational diseases are illnesses or any chronic ailments resulting from work or exercise seeking for livelihood. In the light of this, Dewi et al. (2023) and Browser (2019) had affirmed that an occupational disease is one caused by work and/or the work environment; and is typically identified when it is shown that it is more prevalent in a given body of workers than in the general population, or in other worker populations. Occupational health problems comprise occupational diseases, work-related diseases and any injuries sustained in course of activities for livelihood such as fishing, lumbering, professional sports, healthcare provision, core academic exercise and others. Hence, an occupation that is meant to serve for sustenance and economic support is fraught with health problems such as fresh injuries and morbidity, and sometimes resulting in mortality consequent upon associated determinants. The determinants of occupational health problems could be classified as psycho-socio-economic (psychological, social & economic), ageing and biophysical entities. The psychosocio-economic and demographic (age) variables are basically indirect determinants (Figure 1) which the present work focused on. Offiah and Orisa-Ubi (2025) had earlier published research on the direct determinants (river channel siltation, ocean material pollution and incompatible canoe usage) as well as both direct and indirect determinants of insecurity menace and fishing value-chain activities involving either up-stream or down-stream aspects (Orisa-Ubi et al., 2025).

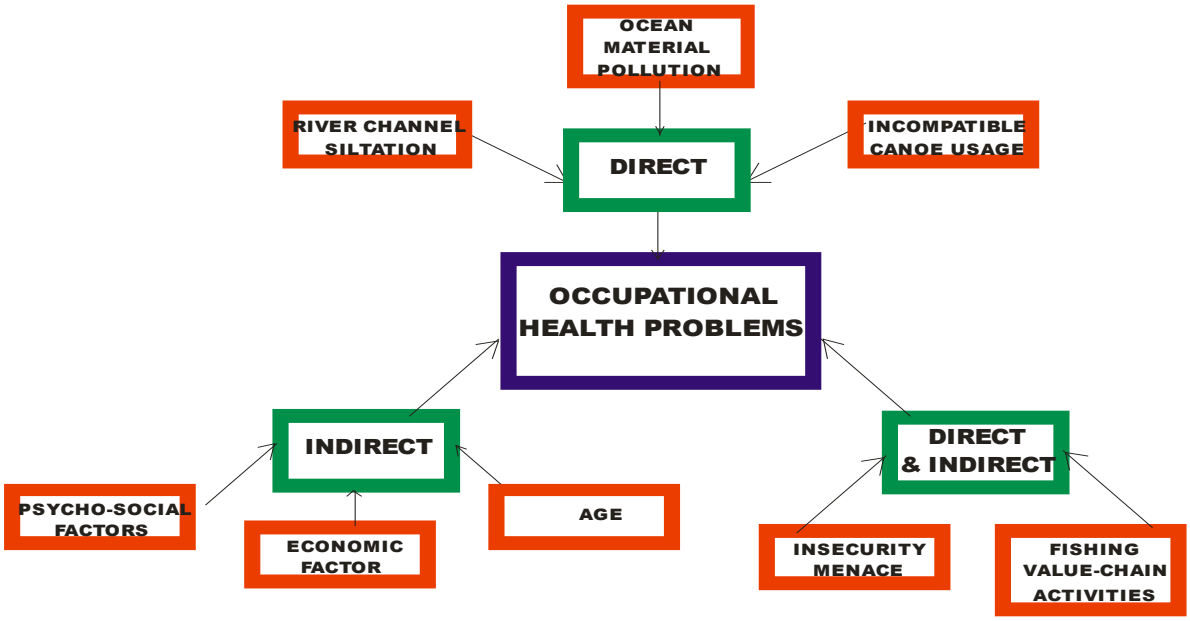


Figure 1: Offiah's Coastal Fishing Occupational Health Problems Determinants' Conceptual Framework

Coastal fishing provides good source of nutrition, employment and supported national economies. A total first sale value of fish had been estimated at USD 401 billion from total production of about 179 million tonnes in 2018, China taking the lead as a major fish producer (FAO, 2020). Furthermore, despite persistent differences in levels of fish consumption between regions and individual states, clear trends could be identified; there are generally increasing trends in both developing and developed countries (FAO, 2020). The huge African marine fisheries sector was valued at US$ 24 billion annually. It appeared the small-scale fisheries (SSF) make a greater contribution to the continent's economy than their industrial counterparts (Okafor-Yarwood & Allison, 2021). The economic survival

of Africa's SSF is still being affected by industrial fishing by distant water fleets through over-exploiting fish stocks with overfishing in an illegal, unreported, and unregulated fishing. By 2007 Nigeria domestic fish production was put at 551,700 metric tonnes as against the then national demand of about 1.5 million metric tonnes. The shortfall was said to be bridged by the importation of 680,000 metric tonnes annually consuming about ₦50billion in foreign exchange, which was a significant drain on the national foreign reserve (Oyediran et al., 2017). There were 90% of fishermen who work in small-scale fishery industries, and 97% of small-scale fishermen were found in less developed countries (Vatria et al., 2019). It had been stated that Food and Agriculture Organization (FAO) and International Labour Organization (ILO) estimated that 30 million fishermen were working aboard roughly 4 million fishing vessels operating in capture fisheries with 1.3 million decked vessels, and 2.7 million undecked vessels.

Coastal fishing is among the most difficult occupation in the world leading to diverse occupational health problems (injuries, occupational diseases and associated occupational diseases) which include but not limited to abrasions, punctured wounds, musculoskeletal disorders, hearing/visual impairment, hypertension, and infections (Frantzeskou et al., 2016). The study by Chauvin et al. (2017) and Kaustell et al. (2016) had noted that the most frequent consequences of maritime occupational injuries (MOIs) were bruises and muscle strain (19.82%), open wounds (17.99%), fractures and dislocation (16.86%), backache (13.22%), and "other consequences" (15.04%) with the hand injuries being extremely frequently presented. On fishing occupational fatalities, the latest estimates reported by the International Labour Organization (ILO) indicated that over 7,500 people die every day from work-related diseases and accidents worldwide, representing 5% of all annual fatalities (Klinkhardt, 2023; ILO, 2019; FAO, 2018; Hämäläinen et al., 2017). An estimate of such deaths among worlds' fishermen workers per year ranged from 21,000-100,000 annually depending on the country but rates higher than 100 fatalities per 100,000 active fishers in developed countries had been reported (FAO, 2021; Willis & Holliday, 2022).

As at 2015 the Global Burden of Disease Study noted that workers in developing countries suffered more from occupational risks and experienced great losses. The Food and Agriculture Organization of the United Nations (FAO) and World Health Organization (WHO) undertook Microbiological Risk Assessment giving report on the safety and quality of water used in the production and processing of fish and fishery products (FAO & WHO, 2023). The Occupational Safety and Health Administration (OSHA) of the United States has rules of engagement in fishing and shipping business (its 2015 fact sheet) to minimize health and safety risks in US-based workplaces (Tarlengco, 2023; Environmental Health and Safety [EHS] Insight Resources, 2019). Dewi (2023) had stated that the Food and Agriculture Organization (FAO) established guidelines for protecting small-scale fisheries (SSF), especially in terms of occupational health aspects. Nigeria, similarly, had laws in form of acts, decrees, regulations and ordinances mainly dealing with the development, management, exploitation and conservation of the living resources of Nigerian waters but with inadequate compliance enforcement of the operational guidelines in coastal fishing in the country (Ojekunle, 2020; NIMASA, 2023). The continual world catch decimated fish stocks leading to World Wildlife Fund, WWF (2021) forecasting that issues of food scarcity and loss of employment due to overfishing will continue to affect about 2.6 billion people that live in coastal communities and developing nations, for they greatly depend on fish to survive.

It is a fact that many persons, moreso among some Africans, do not usually go for medical check-ups. Our artisanal fishermen rarely observed/adhered to the internationally required safety precautions and guidelines for fishing which could affect and worsen their health conditions. It has been observed that the artisanal fishing business is more manual, very difficult and energy-sapping activities. It is often noted that the state of any such chronic health conditions could get complicated. Therefore, non-

ISSN: 2992-3727 Published 30th November, 2025

screening for early diagnosis of hypertensive condition can result to stroke, expensive management of the condition and inadequate care for such families. The reduced fish stock and low volume of catches made some artisanal coastal fisher-folks continue venturing into the ocean even with their poor health conditions. The above situations and dearth of systematic study of these occupational health problems in Rivers State fishing ports prompted this study to examine the more indirect determinants of occupational health problems associated with coastal fishing. The researchers thus aimed to investigate "Economic and age determinants of occupational health problems associated with coastal fishing in Rivers State" through the following objectives: i) To examine economic factor as a determinant of occupational health problems associated with coastal fishing in Rivers State; and ii) To ascertain age as a determinant of occupational health problems associated with coastal fishing in Rivers State.

Methodology

The research was carried out in two senatorial districts of Rivers State. These are Rivers South-East and West Senatorial Districts. Rivers State is one of the six states that made up the South-South Geopolitical Zone of Nigeria. The study was a cross-sectional descriptive survey. The study population of the coastal artisanal fishermen was taken from register of their associations totalling 2051 of them. The researchers used 20% as sample (410) of the population for the study according to the views of Bullen (2024), and Olaf College (2024). Other larger artisanal fishermen engaged in diverse fishing expeditions without venturing into the ocean. With reconnaissance visits we were able to identify chairmen of coastal artisanal fishermen in nine cluster settlements who had register of members. The clusters used, had two each situated in Rivers South-East Senatorial District and Rivers West Senatorial District; but fell within three Local Government Areas (LGAs) of Akuku-Toru, Andoni, and Bonny. Oyorokotor Fishing Port in Andoni LGA had 1326 coastal artisanal fishermen, Agbama and allied fishing ports had 89, Amariari fishing settlements of Bonny LGA with 417, and Kula coastal fishing communities in Akuku Toru LGA had 219 coastal artisanal fishermen. Multi-stage sampling procedure was employed where these clusters served as the strata. Simple random sampling was used to select four clusters out of the nine; and systematically we administered copies of the validated, structured questionnaire of reliability coefficient 0.87 with helping hands from four assistants. Checklist was also used to note some social and physical states of the communities. Three research questions and three hypotheses had been in this work. Data were analysed using statistical product for service solution (SPSS) version 25.0 along with other descriptive and inferential (Point Biserial Correlation) statistics.

Results

Tables 1-4 presented the analysed variables and results.

Research Question 1: To what extent does economic factor constitute a determinant of occupational health problems associated with coastal fishing in Rivers State?

Table 1: Weighted mean and standard deviation showing extent to which economic factor constituted a determinant of occupational health problems associated with coastal fishing in Rivers State

SN	Items	$\bar{X}$	Std Dev	Decision
1	Imminent economic loss from little or no fish catch for fairly prolonged period is a factor in occupational health problems.	3.15	0.56	High extent
2	Issues surrounding un-serviced loan burden can lead to anxiety.	2.76	0.54	High extent
3	Canoe procured at relatively high cost could quickly get wane.	2.46	0.51	Low extent
4	Too much wastage of fish during time of increased fish-catch is due to poor processing methods and lack of storage facilities.	2.91	0.76	High extent
	Grand mean	**2.82**	**0.59**	**High extent**

Criterion mean = 2.50. Guide: 0 - 1.49 = very low extent; 1.50 - 2.49 = low extent; 2.50 – 3.49 = high extent; 3.50 – 4.00 = very high extent

Research Question 2: To what extent does age constitute a determinant of occupational health problems associated with coastal fishing in Rivers State?

Table 2: Weighted mean and standard deviation showing extent to which age constituted a determinant of occupational health problems associated with coastal fishing in Rivers State

SN	Items	$\bar{X}$	Std Dev	Decision
1	Mature, energetic age of 21-50 years is ripe for coastal fishing with rare resultant occupational health problems.	2.05	0.44	Low extent
2	Ages 61-80 involving in coastal fishing could increase the possibility of occupational health problems occurrence.	3.25	0.62	High extent
3	Any age involving in coastal fishing cannot cause occupational health problems.	2.41	0.44	Low extent
	Grand mean	**2.57**	**0.50**	**High extent**

Criterion mean = 2.50. Guide: 0 - 1.49 = very low extent; 1.50 - 2.49 = low extent; 2.50 – 3.49 = high extent; 3.50 – 4.00 = very high extent

Hypothesis 1: There is no significant relationship between economic factor and occupational health problems in coastal fishing in Rivers State.

Table 3: Point Biserial Correlation showing relationship between economic factor and occupational health problems in coastal fishing in Rivers State

Variables		Occupational health problem	Economic factors	Decision
Occupational health problem	Correlation coefficient	1	0.67	H_o rejected
	Sig.		0.00*	
	N	407	407	
Economic factors	Correlation coefficient	0.67	1	
	Sig.	0.00*		
	N	407	407	

***Significant; p<0.05**

Hypothesis 2: There is no significant relationship between age and occupational health problems in coastal fishing in Rivers State

Table 4: Point Biserial Correlation showing relationship between age and occupational health problems in coastal fishing in Rivers State

Variables		Occupational health problem	Age	Decision
Occupational health problem	Correlation coefficient	1	0.12	H_o rejected
	Sig.		0.00*	
	N	407	407	
Age	Correlation coefficient	0.12	1	
	Sig.	0.00*		
	N	407	407	

***Significant; p<0.05**

Discussion

Economic factor as a determinant of occupational health problems in coastal fishing

Finding revealed that the grand mean of 2.82±0.59 was greater than the criterion mean of 2.50 indicating a high extent. Findings revealed that there was a statistically significant relationship between economic factors and occupational health problems of coastal fishing as $p<0.05$ ($N = 407$, $r = 0.67$, $p = 0.00$). The researcher had expected the items: 'imminent economic loss from little or no fish catch for fairly prolonged period' and 'issues surrounding un-serviced loan burden leading to anxiety' to be determinants of occupational health problems to a very high extent, but others were as expected.

Our artisanal fisher-folks had been made to venture into deeper ocean with their poorly smaller vessels due to the activities of offshore trawler fishing members and with foreign such fleets coming to shallower fishing sites, thus decimating fish-stocks meant for the pirogues. Recall that in this millennium it is expected that the fisheries sector shall be dynamic, technologically advanced and

internationally competitive in a fair market regime with the transformation guided by the sound practices of resource efficiency, sustainability, equity and active private sector participation. The protection of coastal fisher-folk against foreign intrusion shall extend to offshore fishing grounds. Protection of the rights of artisanal coastal fisher-folks in the preferential use of, especially the local communities with priority to their length of statutory fishing ground without foreign fishing lines competition or usurpation becomes imperative. Fishery workers of lower grade need receive a just share for their labour in the use of marine and fishery resources.

It is noteworthy that any investor expected profit from a business, the absence of which could cause apprehension especially when credit facility was involved. Hence, a situation of low business outcome in the face of un-serviced loan burden did bring anxiety, a state of despair and possible depression as associated occupational health conditions to these poor, artisan fishermen. Up to the time of this study, there were not any cold-rooms for improved storage facilities to enable preservation of fish in time of increased catch in the studied clusters. The too much wastage of fish caught and a procured canoe not being durable enough constitute a determinant of occupational health problems in the long run. The artisanal and poor coastal fisher-folks would be further impoverished leading to poor feeding and inadequate healthcare maintenance but emergence of associated occupational disease (an aspect of occupational health problems). For instance, an injury sustained would not be properly treated resulting to massive infection and other complications due to financial crunch.

Inyang and Udong (2013) studied "livelihood insecurity and diversification among women in an environmentally-challenged Niger Delta Region, Nigeria". The researchers assessed stresses and shocks from environmental pollution, seasonal cycles of resource use and changes in access created conditions resulting in livelihood especially food insecurity for rural households, which the women had become the main breadwinners in most of them. They observed that the women were left mostly with 'Fish processing (82.22%), and processing of non-fish aquatic products (73.87%)'as the major economic activities for their household survival/livelihoods. The situations here implied that in strained financial deficit for the men in coastal fishing, their wives assumed household livelihood strategic hegemony to avoid starvation and associated ill-health. This state of economic realities projected economic factor as a determinant of occupational health problems in coastal fishing. Inyang and Udong (2013) work had used descriptive cross-sectional research design, questionnaire and checklist for follow-through observation along with descriptive statistics of percentage just like the present study. However, the present work used inferential statistics of point biserial correlation and more descriptive statistics like mean with standard deviation in its analysis unlike earlier study compared herein. Both works recognize place of economic factor as a determinant of occupational health problems.

Dokubo and Amadi (2022), in their work had noted economic factor as part of vehicle for fisher-folk participation in community development in Okrika Local Government Area of Rivers State. They pointed to financial status; an economic factor as necessary for participation in community development in the area of study. In line with the present study, this position was true because good, stable economy powered purposeful business transactions at such coastline communities so that the coastal fishermen could progress in their coastal fishing with meaningful gains. Conversely, poor community development might present precarious situations and slow down occupation of the inhabitants which could impede economic progress, an aspect of community development. Furthermore, persistence of this state of affairs would eventually results in occupational health problems. Nevertheless, the present study was in line with the just concluded Dokubo and Amadi (2022) project which presented economic factor as a determinant of occupational health problems in coastal fishing. Both studies applied descriptive survey design and questionnaires for data collection. The population of their work consisted of 796 members and 240 sample size while the present work

had a population of 2,051 and sample size of 410. Both studies used members of associations namely four fisher-folks' community-based organizations (FCBOs) in 2022 and four similar ones for coastal fishermen in 2023.

Munyi (2010) investigation has economic dimension of destructive fishing activities in the South Coast of Kenya noting that destructive gears and dynamite fishing led to excessive bycatch and juvenile wastage and serious damage to coral reef habitat, thus threatening sustainability. Munyi (2010) used descriptive survey research while Offiah et al. (2025) used descriptive cross-sectional research design. The earlier work had only used descriptive statistics for data analysis, but the just concluded study additionally used inferential statistics like point biserial correlation. The two studies had applied the questionnaire and checklist for data collection. The earlier work had focused on causes of reduced/low fish-catch leading to fishermen anxiety but the new study concentrated on poor/inadequate fish quantity as leading to downcast apprehension (a psychological worry) of not meeting up clearing the huge, outstanding debts (an economic factor) constituting a determinant of occupational health problems (basically as associated occupational condition) in coastal fishing.

Age as a determinant of occupational health problems associated with coastal fishing

The finding revealed that the grand mean of 2.57±0.50 was greater than the criterion mean of 2.50 indicating a high extent possibility to determining occupational health problems in coastal fishing. Finding was that there was a statistically significant relationship between age and occupational health problems of coastal fishing as $p<0.05$ ($N = 407$, $r = 0.12$, $p = 0.00$). The findings were not fully as expected by the researcher. It was expected that 'ages 61-80 involving in coastal fishing could increase the possibility of occupational health problems occurrence' need had very high extent influence, whereas 'mature, energetic age of 21-50 years with rare or reduced resultant occupational health problems are preferable for coastal fishing' led to the problems by very low extent.

This expectation was worthwhile because coastal fishing by artisanal fisher-folks had been noted to be very strenuous, frequent injury-laden and one of the most difficult, dangerous occupations. The aged (81years and above) would get their already bad health conditions worsened, thus contributing to increased occupational health problems' statistics. The strenuous nature and many injuries associated with the occupation also prevented ladies or young women from participating. On a similar base, any age (like ≤20 years and 51-60yr) involving in coastal fishing could most likely constitute a determinant of occupational health problems since such persons might be frail and easily sustain injuries. On this premise, the elderly ones would have been placed on special care and on appropriate social security for their up-keep; but this is still lacking in Nigeria and most African countries as averse to situations in developed countries. Coastal fishermen with the age bracket of 21-50 years could not be totally free from occupational health problems such as injuries.

Araujo-Vila et al. (2022) had assessed "age factor in the analysis of occupational risks in the wood industry of Galicia, Spain". It was revealed that there was a growing concern to integrate the older group into occupational safety and health management due to the increasing work life. The older group was not the one with the greatest number of occupational accidents (8.3%), but rather occupational diseases (90% of cases would be people aged 55 or over). The study noted that the older workers were the ones that needed better working conditions in the face of physical deterioration and thus large proportion of them were being transferred to administrative tasks. This led to lower presence of older workers in high-risk, physical tasks with enormous vigour-laden activities. This situation was in line with the present study on coastal fishing that involved energy-demanding, risky and very dangerous injury-laden exercises; and ages about 70 years or less than 17 years should not be part. The Araujo-Vila et al. (2022) study applied a descriptive research design; used open-ended questionnaire for online interview of 52 persons selected by simple random sampling technique. The now concluded work rather used mainly closed-ended questionnaire and follow-through checklist for data collection.

The two studies used descriptive research design and simple random sampling technique. The earlier work had a population of 3000 and sample of 52 respondents as well as use of an Excel sheet with thematic analysis, whereas the Offiah et al. (2025) study was with a population of 2051, sample of 410 respondents and SPSS package usage. Both works used qualitative analysis and at a confidence level of 95% (0.05 probability error margin). Furthermore, the present work used inferential statistics of point biserial correlation, which the earlier work did not.

Recommendations

1. The coastal fishermen associations should intermittently engage in enlightenment campaign/orientation on improved safety methods used now in fishing to allow increased number of members in the business.

2. Rivers State Government and non-governmental organizations (NGOs) should set up or improve on health facilities at or near these coastal settlements to help these coastal artisanal fishermen remain healthier and spent lesser amount of money for illness.

3. Stakeholders and civil society groups should set up cold-room stores at these coastal fishing communities to help fishermen preserve their catches in order to make maximum gains therefrom.

4. Coastal artisanal fishermen should seek, imbibe and apply other alternative, cost-effective, improved and better methods for fish preservation and thus increased revenue yield to enable them buy canoes of durable woods and service any loan procured.

5. The coastal fishermen associations operating at these fishing community clusters should merge and float 'Credit and Thrift' scheme to help members access certain level of fund that would enable them withstand period of economic down-turn.

6. The Federal and Rivers State Governments should jointly carry out coastal embankment at these settlements to reduce marine erosion and flooding in order to eliminate higher recurrent expenditure from relocation to new sites and building new houses.

7. The NGOs and National/State Assembly members in collaboration with coastal fishermen associations should support training these men on fire outbreak and its spread prevention and control.

8. The coastal fishermen associations should advise their elderly members (65years plus) to concentrate on counselling younger ones (21-64 years) in the business techniques rather than active participation so as to improve their health status.

9. Older coastal artisanal fishermen should start early to embrace training in alternative, less strenuous trades to avoid being left with no means of livelihood.

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