Community perception, awareness, and knowledge of coastal erosion with special reference to the South-Eastern coastal region, Oluvil, Ampara, Sri Lanka

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Abstract Coastal erosion is an environmental issue that has been aggravated by anthropogenic activities, leading to a worrying situation in the coastal zones of Sri Lanka in recent decades. The present study attempted to determine the community perception and awareness of coastal erosion in the South Eastern coastal region around Oluvil, Sri Lanka. 120 residents of Oluvil were selected following a random sampling method to conduct a survey using a structured questionnaire in 2020. The survey results revealed that 95% of the residents were aware of the coastal erosion while 50% were extremely concerned about it, particularly because it has worsened over the last 10 years. Awareness was significantly correlated with the level of education of the residents. About 77% of residents noted that coastal erosion in the last ten years had rapidly increased. Construction of the Oluvil fishery harbour was believed to be the major cause of coastal erosion in Oluvil, with 81% of respondents strongly agreeing in this regard. Further, 88% of residents believed that the existing conservation measures were not providing effective protection from coastal erosion. Many of the affected people had suggested permanent closure of the harbour as a measure to address coastal erosion. Knowledge and awareness about conservation measures to control coastal erosion were limited. It is suggested to provide adequate knowledge and awareness through training, workshops, and campaigns in future to protect their livelihoods and the local economy from the effects of coastal erosion. The findings of the study would be helpful to the responsible authorities and government to adopt appropriate measures to minimize the impacts of coastal erosion in Oluvil.

Keywords: Campaigns, harbour, livelihood, local economy, residents.

1 Introduction

Coastal landforms often prove to be of considerable socioeconomic importance because of their tourism potential, trade opportunities, the richness of natural

resources and moderate climate. However, due to natural factors and human intervention such as urbanization, exploitation of resources, tourism, and climate change induced by population pressures, these areas are subject to degradative issues. These include coastal erosion, pollution, loss of coastal habitats (e.g., coral reefs, mangroves, sand dunes, lagoons and marshes) and degradation of archaeological, cultural and scenic resources (Seneviratne 2005). Therefore, coastal erosion is receiving much attention presently in many parts of the world as it has negative impacts on biodiversity, ecological balance and in fact, the life of all living beings. It is a growing and serious problem, with about 70% of sandy coasts being marked as vulnerable to erosion across the world (Ye Yincan *et al.* 2017).

Coastal erosion is a natural phenomenon that continuously changes coastlines by the action of ocean tides, tidal movements and wind and wave motion (Airoldi *et al.* 2005). In general, coastal erosion is caused by natural events (e.g., storms, tides, monsoon generated strong waves and wind) but human activities at various scales contribute to a great extent as well. Occurrence of coastal erosion may be of a transient or permanent nature so that regaining of the coast after a few days or years is possible in transient cases but not in permanent cases. Transient coastal erosion occurs either due to tidal cycles or occasional variation in sea levels, or even with irregular events like storm surges and tsunamis (Naga Kumar *et al.* 2019). Meanwhile, rising global sea level, decreasing sediment supply from rivers, and construction of coastal structures can cause permanent erosion (Naga Kumar *et al.* 2019). On average, coastal erosion causes the coastline to recede by about 0.5 m to 2 m per year.

Being an island with a coastline extending about 1600 km in length, Sri Lanka is also affected by coastal erosion issues dating back to several years (Seneviratne 2005, Lin and Pussella 2017, Fernandopulle, 2019). According to the Coast Conservation Department (CCD 1990), the impact of coastal erosion is most severe along Sri Lanka's western and southwestern coasts (as cited by Balasuriya 2018). Every year, a section of the coastline that stretches over 685 km in the south, southwest and the west coast is eroded, and about 175,000–285,000 m^2 of coastal land are lost (Seneviratne 2005). Though the coastal erosion is principally caused by storms accompanying the monsoonal rainfall (North-East and South-West monsoons), several anthropogenic activities too contribute to this erosion in Sri Lanka. Human activities responsible for causing coastal erosion in Sri Lanka include mining of sand from beaches and rivers, mining of inland coral, coral collection from beaches, breaking of reefs, and dynamiting for mining and fishing. Additional reasons are inappropriately located and built coastal structures (e.g., groynes, revetments and jetties), coastal buildings and harbours, and removal of coastal vegetation (Balasuriya, 2018). Further, Samaranayake (2003) has noted that in Sri Lanka, mangrove destruction, shrimp farming and cutting of fuelwood are also important reasons for coastal erosion. As results, damage to or loss of homes, hotels and other beachfront structures, undermining of roads, loss or deterioration of productive land,

and disruption of fishing, navigation, recreation and other activities (Seneviratne, 2005) are seen as effects of the coastal erosion in SL, which in turn creates a clear need for coastal conservation.

Mitigation of coastal issues and conservation of coastal landforms has become increasingly important. Strategies and approaches adopted for mitigation of coastal issues are preservation and governance, law and regulation, education, knowledge and awareness, and the offering of incentives (Salafsky *et al*. 2002). In the effort to halt coastal erosion, several measures have been taken. The measures primarily adopted include the building of protective structures with hard facings such as breakwaters, groynes, seawalls, and dykes. These measures help to stabilize and retain the beaches, reclaim the land, and thereby increase the area's commercial potential and recreational value. However, complete control of erosion has not been attained as some of these measures while protecting some areas induce erosion in adjoining areas. Amongst various conservation strategies, awareness and education are far more crucial prerequisites for ensuring proper planning and management of coastal conservation. Jayasiri *et al*. (2018) mentioned that the current national policies and guidelines related to coastal hazards are not yet aligned with the post-2015 global standards. Therefore, in Sri Lanka, training and public awareness campaigns must be conducted to raise the capacity and preparedness of the coastal communities to cope with coastal hazards. The main problem is the big gap that exists in respect of the awareness and perception relating to causes of coastal erosion in Sri Lanka between ordinary laymen and professionals. According to a recent news report (Daily Mirror, 2020 April 30), sand mining in Port City cannot be attributed as the cause for the current coastal erosion in Pitipana, Udappuwa and Kalutara regions and it could be due to the sea swells caused by the present climate change. However, residents of these areas are convinced that the sea erosion is mainly due to the Port City construction activities (Fernandopulle 2019).

In recent decades, coastal erosion has been witnessed in the eastern coastline as well. Oluvil in Ampara district is one of the regions that is affected by coastal erosion in last few years (Ameer 2015) and the construction of fishery harbour is being believed as the cause for erosion by the community mainly referring to the layman. However, no scientific studies have focused on perception and awareness about coastal erosion in this region as per the knowledge of the authors. Keeping this in mind, the present study was aimed to assess the community perception and awareness of coastal erosion in the Oluvil region.

2 Material and Methods

2.1 Study area

Oluvil, a coastal settlement in Ampara district lies along the Eastern coast of Sri Lanka between 7°14' 31" and 7°21' 50" N and between 81°51' 09" and 81°51' 52" E.

The coastline of Oluvil extends about 16 km from Nintavur in the North to Addalaichenai in the South. The predominant monsoon that prevails in the study area is the North-East monsoon, which is mainly responsible for the coastal erosion in Oluvil.

2.2 Data collection

A structured questionnaire was used to collect the primary data. A representative sample of 120 residents from Oluvil was randomly selected to answer the structured questionnaire and to be interviewed later. The questionnaire was divided into several sections containing varying numbers of questions that focused on different attitudes of people with respect to coastal erosion including demographic details, awareness, perception, concern and behavioural changes. The questions on perception were scored using a five-level Likert scale while questions on behavioural changes focused on binary variables. Finally, the collected data were coded and analyzes by Microsoft Excel.

2.3 Statistical Analysis

Shapiro-Wilk normality test was carried out to test the normality of the data. Descriptive statistics such as means, simple percentages, graphs and frequency were analyzed using SPSS (Version 23.0). Further, the relationship between factors affecting public awareness of coastal erosion was estimated using a multiple linear regression model and a multinomial logistic regression model (Oweini and Houri 2006, Guillen 2014). This study assumed that the dependent variable of awareness about coastal erosion was a continuous variable and therefore, simple linear regression was used (Wooldridge 2013). The following model was estimated to find the factors that influenced public awareness on coastal erosion.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_2 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + u$$

where, Y = Awareness of people about coastal erosion (Years); X1 = Gender (Binary variable); X2 = Age (years); X3 = Level of education (Categorical variable); X4 = Occupation (Categorical Variable); X5 = Awareness on coastal erosion (Categorical Variable); X6 = Perceived impact of coastal erosion on fish production (Categorical Variable); X7 = Perceived impact of harbour construction on coastal erosion (Categorical Variable); u = error (0, N ~ σ).

3   Results and Discussion

3.1 Demographic profile of interviewees

Demographic details of interviewees are presented in Table 1. Almost 92.5% of the randomly sampled population was male while only about 7.5% of the participants

were female. This is not surprising because more males were to be seen in places like the beach, shop and market of the study area. This is the general behaviour of the population in the study area where the males tended to spend more time outdoors. Further, the common occupations in the study area were fishing and business in which far more males than females were engaged. As for age, about 50% of the study population belonged to the age group 21–40 followed by the 41–60 group. Meanwhile, less than 10% of participants were aged between 61 and 80 and it was again less than 10% for those below 20 years of age. As the largest percentage of the population represented the middle-aged group (21–60), it would appear that the people in this group showed the greatest concern and awareness about coastal erosion and the measures that must be taken to combat it.

Table 1. Demographic details of interviewees (n=120) from Oluvil, Ampara District, Sri Lanka.

		Frequency	Percentage
Gender			
	Male	111	92.5
	Female	9	7.5
Age			
	0-20	9	7.5
	21-40	62	51.7
	41-60	40	33.3
	61-80	9	7.5
Education Level			
	Illiterate	3	2.5
	Primary	7	5.8
	Junior Secondary	29	24.2
	Senior Secondary	39	32.5
	Collegiate	39	32.5
	Tertiary	3	2.5
Occupation			
	Farming	6	5.0
	Fishing	41	34.2
	Business	33	27.5
	Government sector	4	3.3
	Others	36	30

Considering the education level, a high percentage of participants were educated up to the senior secondary (10–11) and collegiate (12–13) levels, followed by the junior secondary (6–9) level. This means that a greater percentage of people are bound to be aware of coastal erosion and have the desire to address this issue. Furthermore, illiterate persons accounted for 2.5% of the population, while those with primary education represented 5.8%. People with tertiary educational qualifications also made up 2.5%. When the occupation of the study population was classified, it was noted that fishing was the main activity with about 34% of the

participants engaged in it. The rest of the participants were involved in various other occupations (Table 1). This included students, storekeepers, drivers, labourers, and security officers working in private companies. Small percentages of the population were represented in the farming (2.5%) and government (3.3%) sectors.

3.2 Awareness and concern about coastal erosion

Awareness is vital for the management of any environmental issue at regional, national and global levels. 95% of the respondents in the Oluvil region said they were aware of coastal erosion but the remaining 5% of people seemed to lack awareness regarding the issue. On average people who were aware of coastal erosion knew about this problem even 10 years ago while more than sixty per cent (63%) of the respondents became aware of this between six to ten years ago (Table 2). Hence, a more or less equal number of respondents had an awareness for a few years (<5 years) as well as a longer period (>16 years).

Table 2. Awareness of people on coastal erosion in Oluvil, Ampara District, Sri Lanka.

Awareness Period (Years)	No. of Respondents	Percentage
1-5	8	6.7
6-10	75	62.5
11-15	21	17.5
16-20	10	8.3
Total	114	95

Furthermore, respondents were asked how deeply they were concerned about coastal erosion, and the responses are depicted in Figure 1. 56% of respondents were extremely concerned about coastal erosion while 32% expressed a high degree of concern. About 2% of the respondents had no concern at all about coastal erosion with another 2% showing minimal concern. Variations in the level of concern manifested by the cross-section of respondents could be attributed to differences in age, education level, environmental consciousness etc.
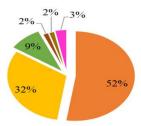

Fig 1. Level of concern of people on coastal erosion in Oluvil, Ampara District, Sri Lanka.

■ Extremely concern ■ Highly concern ■ Fair/Moderate concern ■ Less concern ■ No concern

3.3 Perception of coastal erosion

A set of five questions was posed to respondents to characterize their perceptions regarding coastal erosion inclusive of extent, causes, impact and conservation measures. In respect of the extent of coastal erosion, 77.5% of the study population perceived that coastal erosion had rapidly increased over the previous ten years while 20% perceived a slow increase over this period. Meanwhile, less than 2% claimed there was a rapid decline in coastal erosion in the last ten years (Figure 2). This finding was in line with the finding of Nijamir and Kaleel (2018), who reported that 9.28 ha and 1.14 ha of land had been eroded in Oluvil in the regions to the North and South of Oluvil harbour respectively, in the last few decades (1981–2005). Most of the erosion (5.16 ha) was observed along the Northern coastline of Oluvil in the period 2001–2015 in which the harbour construction was taken place compared to the previous two decades (1981–2000). At the same time, comparatively more accretion was observed than erosion in the Southern part.
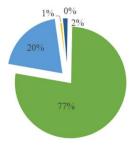

Fig 2. Perception on the extent of coastal erosion in Oluvil, Ampara District, Sri Lanka.

■ Rapid Increase   ■ Slow Increase   ■ No Change   ■ Slow Decrease   ■ Rapid Decrease

The survey which was conducted to learn about the respondents' perceptions on the causes of coastal erosion picked the most likely cause from among the six possible causes that would actually have contributed to the erosion in Oluvil. Almost all the respondents perceived the construction of the harbour as the main cause of the coastal erosion in the study area (Table 3).

Table 3. Perception on causes of coastal erosion in Oluvil, Ampara District, Sri Lanka.

Causes	Percentage
Overpopulation/ Higher population density	0
Construction of harbour	98.3
Lack of awareness and education (people just do not know what to do to protect the coastal sites)	0
Lack of enforcement of existing legislation	0.8
The government does not place enough emphasis on protecting the environment to be in pace with development	0
Government services like coastal conservation are inefficient	0

Hence, respondents' opinion was that the construction of the harbour was the major cause of coastal erosion. More than 80% of the participants strongly agreed with this statement while less than 1% strongly disagreed (Figure 3). Ameer (2015) stated that construction of the fishery harbour caused extreme changes in the Oluvil coastal area, mainly by increasing the erosion rate markedly compared to previous years; greater than 100 m lands retreated into the sea. Poorly located and badly built fishing harbours not only create problems by intensifying coastal erosion but also trigger the wave refraction that causes the currents to carry sand into the harbour leading to heavy silting (Seneviratne 2005). At present, the mouth of the Oluvil harbour is blocked by a sandbank.
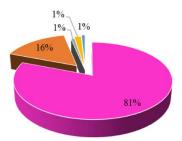

Fig 3. Perception on the construction of harbour as the major cause of erosion in Oluvil, Ampara District, Sri Lanka.

■ Strongly Agree   ■ Agree   ■ Undecided   ■ Disagree   ■ Strongly Disagree

Coastal erosion has a strong impact on economic activity and the livelihood of people in the coastal regions. Since fishing is the prime economic activity in the study area participants were asked about the impact of coastal erosion on fish production. Responses depicted in Figure 4 show that a large percentage of participants perceived coastal erosion as having either a high or severe impact on fish production while 4.2%, 8.3% and 1.7% of participants perceived coastal erosion as having a moderate, minimum or zero impact on fish production, respectively
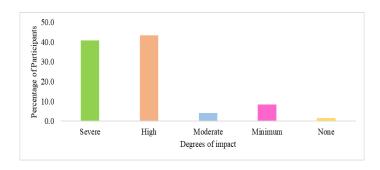

Fig 4. Participants' perception of the impact of coastal erosion on fish production.

3.4 Knowledge and behaviour on coastal erosion

Because coastal erosion has numerous negative impacts, there is a need to test peoples' knowledge on this. So, when respondents were given a set of six statements on coastal erosion and asked to mark as true or false against each statement, very few of them marked 'No' to the statements in contrast to more than 80% who marked 'Yes'. This illustrates that people have adequate knowledge about coastal erosion (Table 4). Responses of people who said yes did not vary significantly from one statement to another. Few respondents proved to be exceptions to this.

Table 4. Respondents' knowledge on coastal erosion in Oluvil, Ampara District, Sri Lanka.

Statements	Response	
	Yes (%)	No (%)
Coastal erosion can be seasonal	70.8	29.1
Decline in fisheries production could be caused by coastal erosion	91.7	8.3
Coconut cultivation has become extinct/ threatened/ endangered in Oluvil due to coastal erosion	90.0	10.0
Coastal erosion can be minimized if advanced conservation techniques are implemented	65.8	34.2
Coastal erosion in the South-eastern region has occurred mainly after construction of the harbour in Oluvil	86.7	13.3
Conservation measures undertaken presently are barely effective	83.3	16.7

As people were sufficiently aware of and possessed good knowledge about coastal erosion, they were assessed for behavioural changes by getting them to answer a structured set of statements. The responses obtained for behavioural changes are summarized in Table 5.

Table 5. Behavioural changes towards coastal erosion and conservation in Oluvil, Ampara District, Sri Lanka.

Behavioural Changes	Percentage Response	
	Yes	No
Try to be more aware of the impact/ consequences/ effects of coastal erosion and about coast conservation	91.7	8.3
Searching and finding alternative conservation approaches	78.3	21.7
Join environmental/ community groups that are involved in conservation activities	99.2	0.8
Be a responsible citizen and make others aware of this issue	99.2	0.8
Refrain from participating in unnecessary protests	77.5	22.5

Majority of the surveyed people have changed behavior in response to coastal erosion and conservation measures. Many of them have joined environmental and or community groups that are active in conservation activities and were trying to instill awareness in other people too about coastal erosion and the appropriate conservation measures. Furthermore, about 75% of the respondents were observed to be in favour of those changes while the remaining 25% of respondents were against the expected changes. This implies the necessity to build up their knowledge about coastal erosion and related environmental issues by means of awareness campaigns, workshops and other means.

For the management of environmental issues, people's voice has to be transmitted to relevant authorities and policymakers. Keeping this in mind, the study population was asked about the authorities to whom they made complaints regarding the issue. About 78% of people answered that they made complaints to several responsible authorities, of which Fisherman Association (FA) and Masjid Trusty Board (MTB) received an equal percentage (32% each) of the complaints, followed by the Fisheries Department (FD), which received 7% (Figure 5). About 25% of the people did not make any complaints at all while the rest made complaints to less relevant authorities. This might be due to their poor educational level and reduced awareness. Though a majority of the people surveyed had complained about the issue, only about 18% of them believed that any meaningful action was taken regarding their complaint. Such poor response from authorities is not unexpected. For instance, Senevirathna *et al*. (2018) reported a case based in the Unawatuna region (Galle District, Southern Province) that the community there had informed responsible organizations, but no proper action had been taken to mitigate the coastal erosion problem.
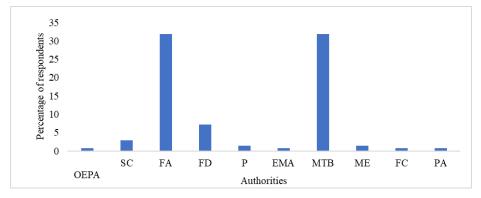

Fig 5. Percentage of participants who made complaints to various organizations about coastal erosion in Oluvil, Ampara District, Sri Lanka. (OEPA- Oluvil Educated People's Association, SC- Sports Club, FA- Fisherman Association, FD- Fishery Department, P- Politician, EMA- Environment Management Authority, MTB- Masjid Trustee Board, ME- Ministry for the Environment, FC- Fisheries Cooperation, PA- Port Authority)

3.5 Perception and knowledge on conservation measures to halt coastal erosion

Both soft and hard preventive measures have been taken across vulnerable coastal stretches in Sri Lanka to minimize the effects of coastal erosion. According to this, piling up sand heaps, placing boulders and rock barriers, and construction of breakwaters along the erosion-prone beaches are the short term and long-term solutions, respectively. These measures are expected to prevent erosion in the study area. However, it is the perception of 71% of the people that the government has not taken any measures to control coastal erosion in the last 10 years in the Oluvil region. This means that only about 29% of the people perceive the government as having taken any steps to minimize coastal erosion.

Furthermore, the perception of residents with regard to protection from erosion by employing suitable measures differs from the government's perspective on this matter. The majority views of the study population on conservation measures taken against coastal erosion showed that existing preventive measures have not proved effective enough against erosion (88%) and have made the problem worse. The remaining 12% of respondents believed that there was no substantial change in coastal erosion after these measures were taken. Poorly designed marine structures actually had a tendency to increase coastal erosion (Seneviratne 2005). The findings of this study agree with the findings of Senevirathna *et al*. (2018), according to which the primary anthropogenic activity responsible for the coastal erosion in the Unawatuna region was the breakwater or stone-block paving.

The respondents were interviewed to learn about their perceptions on how the government would control coastal erosion over the next 10 years commencing from the present. In respect of that, roughly 30% of people believed that the government would adopt new preventive measures while another 30% believed it will strengthen the existing measures to control coastal erosion to a significant extent. Participants' responses to known and suggested preventive measures are shown in Table 6.

Table 6. Response of participants regarding preventive measures against coastal erosion.

Preventive Measures	Response (%)
Known	23.33
Putting up barriers along the coastal belt using boulders	
Temporary closure of harbour	4.17
Tree planting	1.67
Suggested	
Removal of existing block in the harbour	3.33
Permanent closure of harbour	20.83
Addition of more boulders	1.67
Removal of boulders	5.00

About 25% of the study population recommended the permanent closure of the fishery harbour to minimize coastal erosion in future. Oluvil was not found to be a conducive place for the construction of a harbour as per the Environmental Assessment Report prepared during the early stage of the development project and that people had been misled about the potential benefits of a harbour (Mr. Isartheen, Personal communication, April 06, 2020). Furthermore, a few respondents suggested removing the boulders as well, but this proposal was rejected as the majority of people believed the placing of boulders would be an effective preventive measure as it would at least partially decrease erosion (Senevirathna *et al*. 2018).

3.6 Relationship between factors influencing awareness

The model used to estimate was significant as the probability of F-value was 0.02. Similarly, the explanatory variables included in this multiple linear regression explained the dependent variable significantly; thus, 54 per cent ($R^2 = 0.54$) of the variance in the dependent variable was explained by the selected predictor variables. Hence, the following model fit regression equation was derived.

$$\hat{Y} = 8.41 + 0.34X_1 - 0.01X_2 + 0.94X_3 - 0.16X_4 + 1.91X_5 + 1.31X_6 + 1.82X_7$$

The coefficients and significance levels of all independent variables are presented separately in Table 7. The estimated coefficient of the level of education was significant ($p < 0.05$), indicating that increasing the level of education of the general public will raise their awareness of coastal erosion. Therefore, it is important to provide knowledge through lessons to the people who are less educated.

Table 7. Relationship between the factors influencing awareness.

Variable	Coefficient	Standard error	P-value
Gender	0.34	1.72	0.84
Age	-0.01	0.03	0.781
Level of education	0.94	0.43	0.03**
Occupation	-0.16	0.39	0.68
Consciousness on coastal erosion	1.91	0.71	0.04**
Perceived impact of coastal erosion on fish production	1.13	0.54	0.03**
Perceived impact of harbour construction on coastal erosion	1.82	0.58	0.03**
Constant	8.41	3.92	0.03**

**Significant at 5%, F (7, 112) = 44.63; $R^2 = 0.54$; Adjusted $R^2 = 0.43$; n = 120

Further, a person who was more concerned about coastal erosion would be more significantly ($p < 0.05$) aware of coastal erosion. The result indicated that if a person is highly concerned about coastal erosion, he will be more aware of it compared to a person who is only moderately concerned. Also, if the general public perceived that

coastal erosion impacts fish production badly, then their awareness about the erosion would be significant ($p < 0.05$) because people are always highly sensitive to economic impact. At the same time, when people realized that the construction of Oluvil harbour caused much of the coastal erosion in Oluvil and nearby locations they became significantly ($p < 0.05$) aware about the coastal erosion. When people living in Oluvil experienced coastal erosion soon after the commissioning of the harbour, 98% of them suspected that the main cause of coastal erosion was the presence of the harbour (Table 3).

The results presented in the previous sections firmly indicate that coastal erosion has become one of the major environmental issues in Oluvil South over the last few years mainly because of the fishery harbour that was constructed there. Due to the lack of surveys on community perception and awareness about coastal erosion in the South-Eastern coastal regions, particularly in Oluvil, the findings of the current study may be deemed relevant, sufficient and appropriate. Further, the results of the study seem appropriate for generalization to the whole of Oluvil because many of the variables among the sample (gender, age, occupation) were non-significant with respect to awareness and perception about coastal erosion. A high percentage of respondents were aware of and concerned about this erosion issue and its impact on their life in various ways.

Government must pay more attention to environmental issues like coastal erosion at the regional level in near future. A fundamental rights case should be filed on the lines of 'Public Interest Litigation' by the Environmental Commission. A case similar to this was filed and succeeded against the adverse environmental impacts caused by phosphate extraction in Sri Lanka under an agreement signed with a leading US mining company (South Asian Environmental Report 2000). Coastal erosion is induced by natural as well as man-made factors. Control over natural events like monsoonal rainfall is not practical and in such a case the emphasis should be on protection from erosion rather than prevention. It can be attained with the implementation of a hard solution rather than a soft solution for long term conservation. But the available literature (Balasuriya, 2018, Naga Kumar *et al*. 2019) and present survey results indicate that marine structures are not that effective in preventing coastal erosion and can in fact induce erosion. Therefore, the existing marine structures such as offshore breakwater, groynes should be redesigned and upgraded to ensure maximum protection from coastal erosion, or they may be substituted with other more effective and successful measures that are being put in practice in other coastal regions of Sri Lanka and other countries where similar problems are experienced. On the other hand, closure of the harbour is seen by some as the only way to minimize the adverse impacts caused on the environment. But it is practically impossible to do so as it is a development project involving international collaboration.

Steps should also be taken to instill awareness and educate the younger generation on environmental issues as a way to minimize human interventions that cause coastal

erosion. Survey results showed that very few residents were aware of or possessed the knowledge with regard to conservation measures. Furthermore, respondents who were aware of and concerned about coastal erosion belonged to the middle-aged group and as such, they were less likely to be responsive to this general societal issue since their natural tendency was to mainly prioritize their career and family issues. So, educating the younger generation, especially teenagers should be seen as the best way to ensure the sustainable future of countries. In the context of building up sustainable awareness among students, it is important to arrange suitable educational and training programs for them. To accomplish this, various government sectors including schools, universities, public administrative secretariats and departments should join and work together to achieve this mission. Further, the support and contribution of reputed local, national and social media would also play a vital role in the dissemination of information among people by assisting them in planning and sustainably managing the coastal erosion issue.

The people who have a lower level of education level takes more time to be aware of the coastal erosion issue therefore, the young educated people could establish coastal erosion awareness program with the help of government institution to increase the awareness and the issues related to coastal erosion. Further, the consciousness about coastal erosion could be increased via educating and advertising the economic impact of this issue. Finally, a thorough feasibility study, environmental impact analysis and economic analysis should be carried out before establishing a fishery or commercial harbour. Because the finding suggests that most of the individuals are aware of coastal erosion after the establishment of the Oluvil harbour.

5   Conclusions

It could be concluded that the making of awareness among the general public through proper training, workshops and campaigns will lead the proper channel on the development of the safety system against coastal erosion. Many factors such as level of education, consciousness on coastal erosion, perceived impact of coastal erosion on fish production, and perceived impact of harbour construction on coastal erosion showed significant differences. It means that increasing the impact of these factors will lead to a deeper perception among the public. While analyzing the preventive measures what people are thinking; 23.33% insisted on putting up the barrier but 3.33% suggested removing this barrier because of the fishing difficulties. Only 29 % of the people were aware of the necessary steps taken by the government and the majority of them did not have faith. Meantime 12% of the respondents believed that the current level of control measures is working at the coastal level. More than ¾ of the respondents had taken this issue to various levels of management in the country but without any solution. The creation of a fully specified body to make technically

feasible studies while incorporating the government, private and general public will lead to solving these problems.

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