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2 Mass Media as environmental awareness strategies and attitude of farmers towards  
3 deforestation.

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4  
5 ABSTRACT

6  
7 The main purpose of this study was to examine mass media as environmental  
8 awareness strategies and attitude of farmers towards deforestation in the rainforest  
9 zone of southern Cross River State, Nigeria. The study formulated one hypothesis  
10 to guide the study. Ex-post facto research design was considered most suitable for  
11 the study. ~~The Sample sample~~ consists of 568 respondents randomly selected  
12 through the stratified and simple random sampling techniques. –A structured  
13 questionnaire was the instrument used for data collection. –The instrument was  
14 faced validated by three experts in Test and Measurement. The reliability estimate  
15 of 0.83 was established through the Cronbach alpha reliability method. Simple  
16 linear regression statistical tool was used for data analysis. –The result ~~of the~~  
17 ~~analysis~~ revealed that, there is a significant influence of mass media on attitude of  
18 farmers towards deforestation. Based on this finding it was recommended among  
19 others that environmental educators and advocates should ensure that the mass  
20 media should be maximally utilized to continually create environmental awareness  
21 among the citizens in order to empower them to develop more positive attitude  
22 towards eradication of negative environmental practices and actions.

Comment [J2]: Which? to describe

23 Key Words: Environmental Awareness Strategies, Attitude, Deforestation, Rainforest

Comment [J3]: Replace words already in title

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28

29 **Introduction**

30 Forest is a biological community consisting of complex association of trees,  
31 plants, water sources and soil that have evolved over millions of years, providing  
32 habitats for millions of plants and animal species.

33 There is a rapid disappearance of tropical forest as human clears the natural  
34 landscape for farming and pastures, harvesting timber for construction of roads and  
35 urban areas (Robert, 2007). The author further said that deforestation meets human  
36 needs but also has some devastating consequences such as social conflict,  
37 extinction of plants and animals species and climate change that presents  
38 challenges not just local but global. However, it was observed that accelerating  
39 destruction of the rainforest that form a precious cooling band around the earth's  
40 equator is now being recognized as one of the main causes of climate change.

41 Cross River State is blessed with abundance of resources to improve lives.  
42 In a bid to promote or encourage development, several devices have been invented  
43 to enhance agricultural, industrial and transportation activities. These activities,  
44 while providing the raw materials for production of goods and services have also  
45 resulted in pollution of land, atmosphere, vegetation and rivers (Philip, Harrison,  
46 Akintoye, Olorundami, Nkpena & Ukata et al., 2014).

47 Philip et al (2014) pointed out that 19% of the tropical forest zone has been  
48 lost through deforestation. Hence, the need to adopt sustainable conservation of  
49 forest practices. Serious awareness campaign should be created by the  
50 government and environmentalists on the important role played by the forest.

51 Mass media is the process of sending information to a large audience in  
52 different parts at the same time. Mass media play active role in the dissemination of  
53 information on the usefulness of environmental resources. Mass media consists of

**Comment [J4]:** There are texts in the introduction that should be referenced.

**Comment [J5]:** Less, there are just over one million species described in all. To review

**Comment [J6]:** Add reference

**Comment [J7]:** Update

**Comment [J8]:** Add references

54 both print and electronic media. The print media include circulars posters, leaflets,  
55 bulletin, newspapers and journals—~~etc.~~—while the electronic media deals with  
56 television, radio, internet, video and telephone (Shuwa, ~~Shettima, Makinta, &~~  
57 ~~Kyariet al.~~, 2014). Setyawati and Shaw (2015) believed **the media can utilize**  
58 **innovative ways in its programming to educate the audience and to make the**  
59 **message absorbed,. For example information on harvesting guidelines,**  
60 **dangers of illegal logging and indigenous forest management can be**  
61 **packaged into an lively documentary or live broadcast to influence the**  
62 **behaviour change. The media can also provide educational information as**  
63 **well as collecting feedback on the most suitable ways of managing the forest.**

Comment [J9]: Format not bold

64 The function of media includes monitoring, assessment and reporting, as  
65 well documenting issues of public interest. Continuous exposure of media creates  
66 behaviour change and brought impact in various dimensions of the society. Studies  
67 have shown the dynamics of media impact on social, economic and politics,  
68 disaster management and post disaster recovery and public service [~~Imtihani, 2014;~~  
69 ~~Hibino & Rajib, 2014; Reinikka, Svensson et al., 2005; Imtihani, 2014~~].

Comment [J10]: Chronological order

70 Excessive depletion of ecosystem is blamed on inadequate information on  
71 the management and utilization of environmental resources. However, over 80% of  
72 forest areas in Nigeria have been cut down for various reasons that ranges from  
73 logging for timber to feed local and international industries, and the lost of forest  
74 through road construction. The remaining 20% that is left is gradually exploited due  
75 to farming, hunting and overgrazing of animals (Edu, 2008).

76 These environmental awareness strategies are essential for requisite  
77 knowledge, skills, information and ideas in order to change their attitude towards  
78 deforestation of the existing forest resources and applying such skills for

79 sustainable management of forest resources in the state and beyond. The process  
80 of increasing peoples' knowledge and enlightenment on the environment and  
81 challenges as well as acquire the relevance skills to effectively manage the  
82 environment is referred to as environmental awareness strategy (Arcury, 2000).

83 Access to environmental information might be connected to deforestation of  
84 rainforest zone in the study area, depending on the available environmentally  
85 friendly information; people's consumption pattern may be shaped positively.  
86 Environmental awareness strategies may be enhanced through information and  
87 messages that addresses environmental sustainability. Another factor that may  
88 influence deforestation of rainforest zone in the study area may be literacy level of  
89 the people. For people to think right, it may be influenced by their literacy level.  
90 Education promotes balanced judgment, right behaviour and attitude towards the  
91 utilization and management of rainforest resources.

**Comment [J11]:** Add references

## 94 Methods

**Comment [J12]:** To separate the Introduction and the method into sections, to define more clearly the object of the study.

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95 The study area was Southern Cross River State; Nigeria. The Southern  
96 Cross River State is located between latitude  $5^{\circ} 41' 50''$  East Greenwich Meridian  
97 and longitude  $8^{\circ} 20' 25''$  North of the equator. It covers an area of 15,165,54km<sup>2</sup>  
98 while the remaining forested area is 8,290km<sup>2</sup>.

99 The area is a tropical rainforest with a three-layered canopy of tree stand;  
100 the soil type is sandy soil and rich humid. The rainforests is rich in timber and non-  
101 timber forest product (NTFPs) such as bush mango, alligator pepper, bitter kola,  
102 kolanut, hot leaves, walnut, mushroom, mahogany, Ebony and other medicinal  
103 plants and herbs. These forests have veritable habitats for animal species such

**Comment [J13]:** Common plant names should be replaced by their scientific names.

104 as Gorillas, Monkeys, Pangolins and Reptiles. This explains why this forest has  
105 become the point of attraction to conservationists.

**Comment [J14]:** Common animal names should be replaced by their scientific names.

106 The findings of this study may be relevant to the stakeholders such as  
107 lecturers, ministry of environment, NGOs, farmers and other researchers.  
108 Researchers will see the findings of this study as a resource material for acquiring  
109 and imparting relevant knowledge to their learners. Government agencies like the  
110 Ministry of Environment and policy makers will find the results obtained from this  
111 study useful as baseline data required for designing strategies for effective  
112 utilization and management of natural resources.

113 Non-governmental organizations working on environmental conservation and  
114 other related activities may also find the result of this study very useful as it will give  
115 them an insight into the nature of the situation under investigation. Farmers in  
116 Cross River State who practice unsustainable farming will benefit from the findings  
117 to change their perception towards the environment. The findings of this study may  
118 add to the existing empirical literature on the variables of the study. The findings of  
119 this study may be the researcher's contribution to the volume of literature on the  
120 phenomena under study.

### 121 **Purpose of the study**

122 The main purpose of this study is to determine the influence of mass media  
123 on the attitude of farmers towards deforestation.

### 124 **Research question**

125 How does the use of mass media influence attitude of farmers towards  
126 deforestation?

### 127 **Statement of hypothesis**

128

129 The use of mass media does not significantly influence the attitude of  
130 farmers towards deforestation.

Comment [J15]: Remove all for intro section

### 131 Literature Review

132 Mass media provide one of the most effective ready-made information of  
133 reaching a wide target audience on the usefulness of the environment and its  
134 resources. Mass media simply means the physical ways by which one extends  
135 knowledge and skills to listeners (farmers). It is also an agent of information  
136 education, entertainment and motivation to farmers in accepting agricultural  
137 innovations, therefore mass media remains an important and necessary instrument  
138 which can act a vehicle for agricultural technology transfer.

139 The Nigeria Forestry Commission (NFC, 2007) holds that, forest in most  
140 regions in Nigeria has continued to disappear due to human activities. Deforestation  
141 and desertification resulting from the exploitation of unprocessed log wood for  
142 export mostly by the multinational companies which have left no doubt that, comes  
143 2020 Nigeria may not have 40% forest area left. This implies that the rate at which  
144 forest resources is disappearing either through farming or lumbering is not  
145 sustainable. This therefore, calls for adequate measures to be taken to address this  
146 issue.

147 Nkemnyi, Ndobegang Chirenje and Dioh (2016) carried out a study on media  
148 communication aid Environmental Challenges in Buea Southwest region of  
149 Cameroon. The study examined the impact of communication in addressing  
150 environmental challenges and its approaches that influence effective conscious  
151 environmental behavior. A descriptive survey design was used. Data were collected  
152 adopting combine qualitative and quantitative questionnaire that sampled 75  
153 household using SPSS analysis and chi-square for testing the hypothesis. The

154 analysis revealed that media communication on environmental issues is still  
155 conducted merely as a public obligation rather as a tool to influence behavioral  
156 change towards the environment.

157 Therefore communication has not been able to capture and utilize  
158 approaches that can lead to interactive communication and influence positive  
159 environmental habits. There is an urgent need to explore detail strategies that  
160 confirm to local ethics and has the potentials to initiate interactive environmental  
161 communication. The mass media has variety of approaches to reach a larger  
162 audience such as television, radio, newspaper and Internet. These various  
163 approaches must be used to pass environmental education information on certain  
164 key issues. Through these media, people's behaviour and attitude may be affected.  
165 Otherwise, punitive measures should be taken against individuals and corporate  
166 bodies who are found guilty in their mode of operation and relationship with the  
167 environment.

168 Famuyide, Jaiyesmi, Adebayo, Ajayi, Olugbure and Pitan et al. (2013) examined  
169 the Community Perceived Attitude on Forest Related Environmental Issues using  
170 Mass Media in Osun State, Nigeria by utilizing a descriptive survey design.  
171 Stratified and purposive random sampling techniques were used to select a sample  
172 of 97 respondents. Data was obtained qualitatively using structured questionnaires  
173 and inclusive in its posers were inquiries such as: (i) the strategies employed by the  
174 attitude to forest related environmental issues with respect to community  
175 awareness on forestry mitigation approaches; (ii) farmers considered average mass  
176 media as town criers a mere threat. Data analysis was done using Principal  
177 component analysis (PCA) method.

**Comment [J16]:** This is a conclusion? Replace to the end of the manuscript

**Comment [J17]:** Method

178 The analysis revealed that attitude to forest related environmental issues  
179 with respect to community awareness on forestry mitigation approaches have been  
180 ranked very low while more end-user/farmers considered average mass media as  
181 town criers a mere threat; thus FREI cannot have adverse effect on the stability of  
182 the environment. The results of the study brought into focus the involvement of  
183 mass media in disseminating environmental issues as watchdogs for a good  
184 environment but that is currently dominated by incidental reporting from actual  
185 assessment. Most mass media do not channel feedback to appropriate body such  
186 as Forestry Research Institution of Nigeria (FRIN) for processing; therefore, this  
187 disposition becomes imperative for collaboration and vertically.

188 The study recommends that majority of the end-users agreed minimally that  
189 it is important to pay attention to FREI to eco-balance the environment while others  
190 said is mere threat, FREI cannot have advance effect on the stability of the  
191 environment. —Therefore, Education awareness of the general public on FREI via  
192 FRIN, Media Department, News Agency of Nigerian (NAN), Broadcasting  
193 Corporations (BBC), Personal contacts via Phone calls, e-mails have free access to  
194 FREI. The relevance of this study to the researcher is that the need to undertake  
195 effective communication perceived attitude on forest management in the study area  
196 in order to strengthen sustainable livelihoods mass media coverage is essential.

197 Enobakhere, Orem and Onah (2013) investigated Assignment of public  
198 awareness and knowledge of media campaigns on Environmental issues in South-  
199 South Zone. The purpose of the study was to examine public awareness and  
200 knowledge of media campaigns on environmental issues in South-South State,  
201 Nigeria. The authors argued that media campaigns are strong instrument in public  
202 awareness on environmental issues. However, despite the remarkable progress

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203 made by media in providing environmental information in Nigeria, there are still  
204 substantial constraints to the effective management and development of the  
205 environment. The mismanagement of environment has literally contributed to the  
206 problems of erosion and deforestation which has led to deterioration of the  
207 environs. Data was collected through questionnaire; a survey method was adopted  
208 to select a sample of 500 respondents using the Yaro Yamane's formula and  
209 inclusive amongst the poser were inquired (i) whether the respondents are aware of  
210 media campaigns; (ii) whether the indigenes have knowledge in regards to  
211 environmental management.

212 The study revealed that due to media campaign attitudes of respondents  
213 concerning environmental issues has changed positively towards the environment  
214 that is clean for a healthy living and most respondents prefer listening to  
215 environmental campaigns on radio station rather than any other means of  
216 information. It is recommended that media should not down play the issue of  
217 environmental hazards and they should play the agenda function by emphasizing  
218 on the effects of deforestation and general environmental degradation. Also  
219 campaign planners should increase their campaigns on environmental issues; this  
220 will make the public's to be aware and conscious of the environment. The relevance  
221 of this study is that mass media and social organizations have a large more positive  
222 role to play in the dissemination, investigation and use of environmental guidelines  
223 and values. So therefore, Mass media constitute the most effective mechanism for  
224 promoting concern for environmental quality which supports the objective of  
225 maintaining the quality of life.

226 Amu and Agwu (2012) utilized a survey research design. The purpose of the  
227 study was to assess the attitude of 150 journalists in the coverage of climate change

228 news and those who specialized in the areas of science, environment and social  
229 sciences; interview was used as the instrument. Purposive sampling technique was  
230 used to collect data in ten (10) national dailies newspapers based on their circulation  
231 potentials relative to other news. To draw a representative sample, simple random  
232 sampling method was used in selection of 15 journalists in the special areas. Data  
233 were analyzed using frequency, percentages, mean scores and multiple regression.  
234 The analysis revealed that majority of the journalists had favourable attitude towards  
235 reporting of climate change issues while some personal characteristics like sex,  
236 training in reporting climate change issues and years of in-service influenced  
237 journalists attitudes towards coverage of news. The authors suggested that training of  
238 agricultural communicators should receive appropriate attention in universities in order  
239 to ensure that personnel with adequate training in agriculture, communication and  
240 environment are not shortfall in media organizations.

241 Udoibok (2010) asserted that gross destruction of fauna, Flora and water  
242 resources is associated with oil firms operating in the Niger Delta Region of Nigeria.  
243 The Niger Delta used to harbor thousand tons of forest resources, land resources,  
244 water resources and atmospheric resources has significantly received several negative  
245 impacts that have depleted several resources of the environment. Despite the plethora  
246 of law enacted by government of Nigeria yet, a lot still need to be done to sensitize  
247 people and the multinational companies in order to reduce resource depletion if not  
248 eliminate by controlling those operations that lead to environmental degradation and  
249 resource depletion. The author further maintains that, environmental awareness  
250 approaches such as mass media and seminar may be very useful in disseminating  
251 information on environmental conservation and resource management. Ukpe (2008)  
252 maintained that dissemination of environmental information may be adequate with the

253 use of television. Television play vital role in passing information the way it should be  
254 presented. Apart from the verbal information dissemination, animation could be used to  
255 represent or demonstrate specific environmental issue that needs change. When  
256 animation or practical demonstration is used to support information, people's attention  
257 is drawn to appreciate it and also think right. Programme like bush burning and its  
258 damage to the plant and animal species is shown for farmers to take note and restrain  
259 from such attitude. In a study designed to investigate attitude and knowledge of print  
260 media journalists towards reporting of climate change news in Nigeria.

261 The literature reviewed identified that mass media plays a significant role in  
262 influencing people's attitude towards resource conservation and sustainable  
263 resource management. Those who have acquired relevant information about  
264 environmental resource management through mass media tend to conserve and  
265 manage environmental resources more than those who have not gotten such  
266 knowledge. The current study will add further evidence to this especially as it  
267 relates to forest conservation in the tropical rainforest.

## 268 **METHODOLOGY**

270 The research design adopted for this study was Ex-post facto design. The  
271 reason is that the researcher has no direct control over the independent variable.

273 The stratified random sampling technique was used to sample 576  
274 community members selected from 33 communities in Southern Cross River State,  
275 Nigeria. The instrument used for data collection in the study will be the  
276 questionnaire. It will be tagged Environmental Awareness Questionnaire (EAR) and  
277 Attitude of Farmers towards Deforestation Questionnaire (AFTDQ).

278

**Comment [J18]:** The study is a confusion between induction, methodological cuts and an overly long review of the literature. These sections should be reviewed and rewritten more objectively.

279 To ensure that the items selected for inclusion in the questionnaire were  
280 capable of eliciting relevant responses from respondents, the researcher presented  
281 the designed questionnaire to three lecturers in Test and measurement, Through  
282 their constructive criticisms and recommendations some items were dropped and  
283 others replaced. The Cronbach alpha coefficient result obtained ranged between .704 to .821,  
284 which showed high reliability of the research instrument.

**Comment [J19]:** Format font

285 Data used for the study was obtained directly from respondents selected for  
286 the study through the use of questionnaire designed for data collection. In each of  
287 the communities selected for the study, the researcher visited the chiefs to take  
288 permission before administering copies of the questionnaire. The researcher used  
289 two trained Research Assistants to visit all the communities selected for the study  
290 for the administration of the questionnaire. The administered copies of the  
291 questionnaire were retrieved from the respondents after they had responded to  
292 them. Data obtained for the study was duly coded by assigning numerical codes to  
293 each item in the questionnaire.

**Comment [J20]:** The authors should inform the authorization by the Ethics Committee for the study. Because it involves people, this article may NOT be published for approval by the Ethics Committee involving Humans.

**Comment [J21]:** The sampled variables were not described in the text.

## 295 **Results and Discussion**

296 This section covered the analysis of data based on each hypothesis  
297 formulated for the study. This is followed by interpretation of results and discussion  
298 of findings. The hypotheses were tested at 0.05 level of significance.

299 Mass media does not significantly influence farmers' attitude towards  
300 deforestation. The independent variable in this hypothesis is mass media while the  
301 dependent variable is farmers' attitude towards deforestation. Simple linear  
302 regression statistical tool was used for data analysis. The result of this analysis is  
303 presented in Table 1.

304

TABLE 1

305 Simple regression analysis of the influence of mass media on attitude of farmers  
 306 towards deforestation in Southern Cross River State (N = 568)

**Comment [J22]:** Add the year in which data collection occurred

Model	R	R <sup>2</sup>	Adj.R <sup>2</sup>	Std error of estimate	
1	.131	.017	.015	8.7690	
<b>REGRESSION ANOVA</b>					
Model	SS	Df	MS	F	Sig
Regression	757.395	1	757.395	9.850	.002
Residual	43523.224	566	76.896		
Total	44280.620	567			
<b>REGRESSION COEFFICIENTS</b>					
	Unstandardized coefficients		Standardized coefficient	T	Sig
	B	Std error	Beta		
(Constant)	17.661	1.601	.	11.034	.000
Funding	.320	.102	.131	3.138	.002

307

308 The result of analysis presented in Table 1 showed that the predictor or  
 309 independent variable (mass media) significantly influences the predicted variable  
 310 (attitude of farmers towards deforestation). The influence is significantly positive  
 311 (9.850). The regression coefficient showed that mass media ( $\beta = .131$ ;  $t = 3.138$ ;  
 312  $p < .05$ ) is statistically significant in the prediction of attitude of farmers towards  
 313 deforestation of rainforest in Southern Cross River State.

314

315

316 It was revealed from the finding obtained from analysis and testing of  
 317 hypothesis that the null hypothesis was rejected. This implied that there is a  
 significant influence of mass media on attitude of farmers towards deforestation of

318 rainforest in Southern Cross River State. This finding agrees with the finding of  
319 Nkereuwem (2009) which reported that mass media provide one of the most  
320 effective ready-made information for reaching a wide target audience on the  
321 usefulness of the environment and its resources. Mass media simply means the  
322 physical ways by which one extends knowledge and skills to listeners (farmers) also  
323 is an agents of information, education, entertainment and motivation to farmers to  
324 accept agricultural innovations, therefore mass media remains an important and  
325 necessary instrument which can act a vehicle for agricultural technology transfer.

326 The finding of this study also supported the finding of Ukpe (2008) which  
327 revealed that dissemination of environmental information may be adequate with the  
328 use of television. Television plays a vital role in passing information the way it  
329 should be presented. Apart from the verbal information dissemination, animation  
330 could be used to represent or demonstrate specific environmental issue that needs  
331 change. When animation or practical demonstration is used to support information,  
332 people's attention is drawn to appreciate it and also think right. Programme like  
333 bush burning and its damage to the plant and animal species is shown for farmers  
334 to take note and restrain from such attitude.

335 The finding of this study also supported the finding of Enobakhere, Orem and  
336 Onah (2013) which reported that media campaigns are strong instrument in public  
337 awareness on environmental issues. However, the remarkable progress made by  
338 media in providing environmental information in Nigeria, there are still substantial  
339 constraints to the effective management and development of the environment. The  
340 mismanagement of environment has literally contributed to the problems of erosion  
341 and deforestation which has led to deterioration of the environs.

## 342 Conclusion

**Comment [J23]:** Social networks have been replacing mass media. This is not discussed in the article.

**Comment [J24]:** Public policies, laws, and social organizations are more effective at changing attitudes than mass media. This should also be considered in the discussion.

343 The study concentrated on environmental awareness strategies and attitude  
344 of farmers towards deforestation of rainforest in Southern Cross River State. The  
345 result obtained from analysis of data and testing of hypothesis in the study revealed  
346 that there is a significant influence of mass media on attitude of farmers towards  
347 deforestation.

348 Environmental awareness has been identified as a viable tool for actualizing  
349 this goal. An uninformed citizen lacks the requisite knowledge, attitude and skills for  
350 sustainable environmental protection and management. This emphasizes the need  
351 for increased awareness levels towards raising a citizenry that is aware of the total  
352 environment and its associated problems, as well as possesses the skills and  
353 commitment required to participate in the conservation of the environment.  
354 Awareness creation empowers the people with the skills for solving current  
355 environmental problems as well preventing the occurrence of new ones. This will  
356 contribute significantly to the attainment of sustainable development.

### 357 **Recommendations**

358 The results obtained from analysis of data and testing of hypothesis guided  
359 the researcher to make the following recommendations;

- 360 i. The mass media should be maximally utilized to continually create  
361 environmental awareness among the citizens in order to empower them to  
362 develop more positive attitude towards eradication of negative environmental  
363 practices and actions
- 364 ii. Relevant authorities should continue to ensure that residents of the study are  
365 exposed to and encouraged to use available media
- 366 iii. Mass Media should continue to disseminate environmental issues.

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Comment [J25]: Update the references. Most are over five years old

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428

429

**Comment [J26]:** Arrange the references in alphabetical order. To review

UNDER PEER REVIEW