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THREATS OF CLIMATE CHANGE ON CULTURAL TOURISM IN KONDOA DISTRICT, TANZANIA

Ringo, J[1*] and Baraka, S[2]

[1]Department of Geography and Environmental Studies, University of Dodoma, Dodoma, Tanzania. P.O. Box 395,
* E-Mail: *japhetelis@yahoo.com*

Abstract: Climate change affects, directly and indirectly, the tangible and intangible features of heritage sites. However, conservation studies often examine the effects of climate change on nature tourism sites by assuming it as a combined with a concept of cultural tourism. This paper examines the threats of climate change on cultural tourism in Kondoa district taking part in the villages of Kolo, Mnenia and Choka. Cross sectional data were collected from respondents through questionnaire surveys, key informants' interviews and researchers' field site visits. Results have revealed that most respondents were aware of climate change and cultural tourism. Natural wells, traditional huts and clothes, as well as caves were the assets that were used to run cultural tourism. These resources were similarly affected by climate change. More broadly, climate changes stressors destroying those cultural assets involved an increase of abnormal winds, frequent drought and rise temperature/heat waves. The effects exacerbated by climate change via those stressors on cultural tourism involved changes on traditional food, huts and clothes, disappearance of natural wells, and local brews. The study concludes that the protection of cultural heritage and developing climate sensitive resilience is of immediate response as threats are real evident and escalating. It is therefore recommended that there should be a maintenance of a museum in the area having the assets used for cultural tourism for future use of cultural tourism, as well as giving the local community climate change adaptation education to achieve the targets of Sustainable Development Goal # 13 (Climate Action) .

Key words: *Climate change, Cultural tourism, Kondoa.*

1.0 Background information

Climate change has become a convinced hazard in the way of realizing sustainable development goals (Muhammad *et al.,* 2018). Miserably, climate change has been a thorn to developing countries as the countries in this region are bearing the burden of its effects as also many sectors of the economy (such as agriculture, fishing, transportation and tourism) from these countries are greatly climate sensitive (Keith and Marcus, 2016). Climate change is a cross-cutting issue that is of central importance to national development planning in Tanzania. Tanzania's economy is already vulnerable to the impacts of climate variability and change, and climate projections show that the phenomena will further impact climate-sensitive sectors through changes in temperature

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and precipitation patterns (Yanda, 2013; IPCC, 2014; Meaghan *et al.*, 2015; Joseph and Kaswamila, 2017).

Tourism is one of the Tanzanian economic sectors which has been threatened by climate variability and change. Tourism is divided into cultural and nature tourism. As for cultural tourism in Tanzania, it has been under the stewardship of the Tanzania Tourist Board (TTB) in collaboration with the Ministry of Natural Resources and Tourism (MNRT). With over 120 ethnic groups, Tanzania is endowed with a diverse and rich cultural heritage. Visitors encounter authentic culture and experience the real daily lives of Tanzanians by exploring landscapes, scale heights, take part in dances and rituals, listen to traditional music and tales, taste local cuisine and beverages, and make handcrafts (Tanzania cultural Tourism Programme, 2017).

Kondoa District is one among the districts in Tanzania which have cultural heritage resources invested in cultural tourism. Those assets are located in different places in Kondoa such as in Kolo village where there are series of rock paintings, the history of great chief Kimolo and his lifestyle, the Sambwa hill, the *Sandawe* semi bushmen tribe, the natural forests and supernatural wells in Kondoa town (Bwasiri, 2008; Campbell and David 2012). All these assets attract visitors to learn the culture of Kondoa.

Like other environmental resources, these cultural heritage resources have no immune from the threats exacerbated by climate change which could affect them and the entire sector of cultural tourism as observed elsewhere by Ahmadreza, (2019). Although several attempts have been made in researching cultural tourism in Kondoa district such as assessing the management of those indigenous heritages (Bwasiri 2008), livelihood implication of Kondoa world heritage rock painting site (Campbell and David 2012), and the contribution of cultural tourism to local communities livelihood (Cultural tourism enterprise, 2017), unfortunately they have failed to explore the threats of climate change on the operation of cultural tourism. In other words, it is not known to what extent climate change has been a thorn to cultural heritage resources in leading the district. This paper therefore, aims to; (i) determine the local people awareness of climate change and cultural tourism (ii) examine the cultural tourism assets in the area affected by climate change (iii) assess the effects of climate change to the assets used in cultural tourism.

2.0 Methodology

2.1 Study area

Kolo, Mnenia and Choka villages within Kondoa district were purposively chosen for the study. The areas have the centers that operate cultural tourism having immense natural and cultural heritages such as natural wells, caves, hot spring, clothes used by the *Rangi* society, farming tools, rocks shelters, overhanging slabs of sedimentary rocks fragmented by rift faults whose vertical planes have been used for rock paintings for at least two millennia. Kondoa District is in Dodoma Region of Tanzania, lies at 4° 12` to 5° 38` south and longitude 35° 6` to 36° 2` East. Its climate is semi-arid characterized with seasonal rainfall (average rainfall ranges 400 mm in the plateau and 1000 in the highlands) ranging from late December to mid-March with a dry

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spell in February, and receives little to no precipitation to the rest of the years. The temperature falls between 20°C to 25°C.

2.2 Research design and sampling techniques

The study used mixed method, where both quantitative and qualitative methods were applied to enable researchers to get information through use of different methods which triangulated to build the reality of issue under investigation. Also the study employed a cross-section design. The target population mainly covered members of household, because they were the ones involving in cultural tourism and directly affected by the changes of some cultural practices caused by the changing climate. Another targeted people were the local administrators because were the leaders to supervise climate change and tourism interventions in the area and they were also having records and trends of those phenomena's within the area. The same reasons were for the purposive involvement of tourism officer.

The study population involved 90 (≥18 years old) respondents via probability sampling. Also purposive sampling was used to gather more and detailed information from key individuals who were engaging in cultural tourism and concerned with climate change around the study area (i.e. village executive officers and elders among the selected households because they have more knowledge and experiences of the subject matter).

2.3 Methods and tools of data collection

To achieve the objectives outlined above, we have used household questionnaire survey to collect information from 90 respondents concerning their awareness on climate change and cultural tourism, the changes of cultural assets due to climate change, as well as the effects of this situation to the cultural tourism. We have visited them face by face to fill in the questionnaires. We have also pre-tested the questionnaires so as to have valid data and familiarizing the study villages.

The village administrative officers, tourism officers, and local extension experts were also interviewed individually through structured checklists because of their title/job position at the village, ward and district levels. The most issues interviewed were their views on the intersection between the changes of climate and its perturbations to the operation of cultural tourism in the areas. Their information on the study was crucial to add and triangulate the views from the household respondents.

We have also visited the three villages in order to have a physical contact with them through seeing cultural practices and assets used to operate cultural tourism. Organization of visits and routes were under the local leaders and Kolo rock painting antiquities officer.

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2.4 Data analysis and presentation

Qualitative data were analyzed by gaining the understanding of the underlying reasons, opinions, feelings and motivations of respondents towards the questions. On the hand, quantitative data were cleaned, coded and entered into Statistical Package for Social Science (SPSS) software to assist in analyzing and summarizing data obtained to generate means and percentages. Qualitative data were presented by quoting key issues raised by various respondents while considering their opinions and their understanding towards the raised issues. Quantitative data were presented by using graphs and tables.

3.0 Results and Discussions

3.1 Socio-economic background

Social and economic background of the respondents are provided in Table 1. From 90 respondents', about 58.89% of them were males who were more than a half of the respondents as females were 41.1%. In terms of age group, the majority of them were within the range of 18 to 45 years (86.66%) while 46 and above were 13.33% implying that all respondents were matured enough as Muhammad *et al.,* (2018) put that age reflect a sign of maturity and experience. Regarding education level, 45.57% of them have their highest level of education being primary school (have received mostly 7 years of education) entailing a normal literacy on understanding cultural tourism and climate change issues. Agriculture was the main economic activity being practiced by 52.22% of them (Table 2).

Table 1: Socio-economic background of the respondents (%)

	Sex		Ages			Education			Occupations			
	n=30		n=30			n=30					n=30	
Villages	M	F	18-35	36-45	46+	NFE	PE	SE	PS	AG	BS	CS
Kolo	60	40	53.3	33.3	13.3	10	20	53.3	16.7	26.7	56.7	16.7
Mnenia	56.7	43.3	40	46.7	13.3	3.3	40	46.7	10	53.3	36.7	10
Choka	60	40	36.7	50	13.3	3.3	76.7	20	0	76.7	23.3	0
Total	176.7	123	130	130	39.9	16.7	136.7	120	26.7	156.7	116.7	26.7
Average	58.9	41.1	43.3	43.3	13.3	5.6	45.6	40	8.9	52.2	38.9	8.9

n=sample, M=male, F=female, NFE=non-formal education, PE=primary education, SE=secondary education, PS=post-secondary education, AG=agriculture, BS=business. CS=civil servant

3.2 Awareness on climate change and cultural tourism

Respondents were assessed if they were aware of climate change. Results indicate that among 90 respondents who were surveyed in the three villages, 94.4% of them were aware (see Figure 1). They got awareness from family members or friends, media (radios and television), tourists, and village meetings. Similar expressions of awareness by the respondents were also identified

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previously by Muhammad *et al.*, (2018). Furthermore, among them, males were more aware than females due to the fact that most of the males were the key participants in tree planting seminars, environmental conservation seminars and in the community meetings while females left home due to cultural set ups putting more women at home surroundings. This is contrary to the findings elsewhere that women interact more with environmental resources and they are frontiers in detecting any change that encounters the environment (United Nations Commission for Africa, 2009) as they are also the first victims of environmental changes once happen negatively (Stringer *et al.*, 2020).

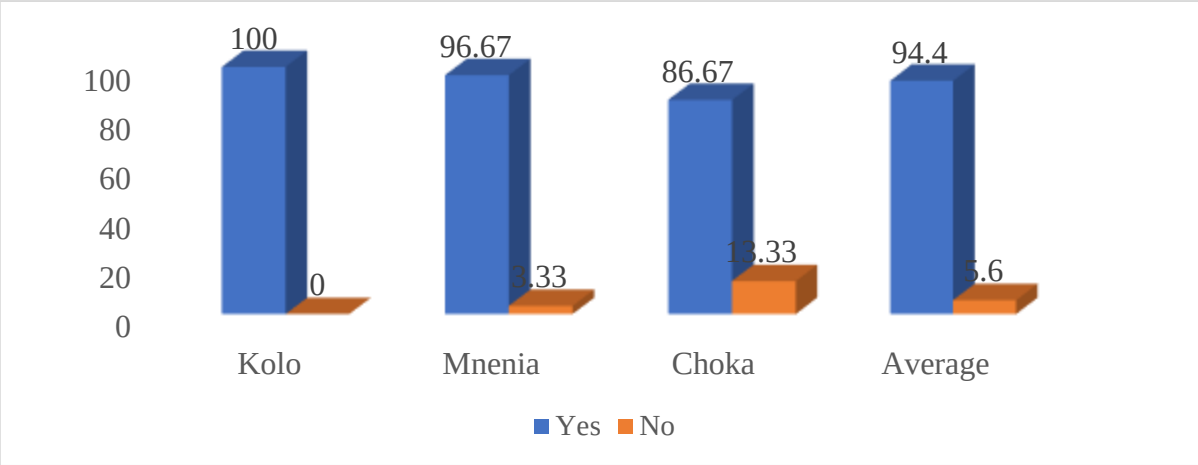

Figure 1: Respondents' awareness on climate change.

Respondents were further probed if they were aware of cultural tourism. Findings in Figure 2 disclosed that about 93.3% of them were aware. We had furthermore requested them to identify their sources of awareness on that sector. They were found aware mostly due to tourism interactions they used to have in their localities, media (radio and television), social networks, as well as students and researchers visits. This signifies that the cultural assets around the study area are still in use for tourism attractions. Also, the results shows how powerful the media and social networks are vital in acquainting people about what prevails. The same goes to the interactions by visitors i.e. students/researchers. The related studies of similar roles were observed by Praveen, (2014) and that of Japhet and Ali (2018).

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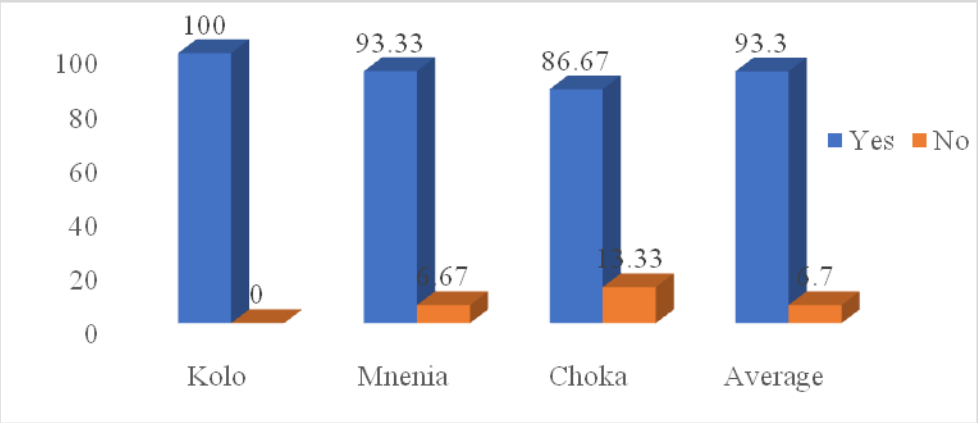

Figure 2: Respondents' awareness on cultural tourism.

3.3 Cultural tourism assets affected by climate change

Table 2 indicate the views pertinent to cultural tourism assets in place. According to this table, many people had the awareness of various assets. For instance, they have identified natural wells, caves and the Chief's house/residence (see Table 2). It is apparent from the results that natural wells were ranked by many respondents tentatively because they were used to most of them to collect water for domestic uses. Interviews with Kolo rock painting Antiquities Officer has added more on the assets. He disclosed that;

> *"..Yes, Kolo, Mnenia and Choka villages have an immense of rock paintings, natural pillars, traditional ceremonies, and handcraft/artifacts of long time ago which are resourceful for tourism and studies".*

Table 2: Cultural tourism assets

	Wells n=30		Huts n=30		Clothes n=30		Chiefs house n=30		Caves n=30	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Kolo	83.33	16.67	50	50	23.33	76.67	60	40	83.33	16.67
Mnenia	86.67	13.33	73.33	26.67	36.67	63.33	13.33	86.67	73.33	26.67
Choka	86.67	13.33	63.33	36.67	40	60	3.33	96.67	66.67	33.33
Total	256.7	43.33	186.7	113.3	100	200	76.66	223.3	223.3	76.67
Average	85.6	14.4	62.2	37.8	33.3	66.7	25.6	74.4	74.4	25.6

In Figure 3 below, are the painted rocks in Kolo hills caves showing various traditions practiced long years ago by ancestors. Currently, they are used for rituals and other cultural practices linked with cultural tourism.

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Figure 3: Painting tradition art and the abduction scene from Kolo hill.

The current study intended also to examine the changes that cultural tourism assets underwent due to climate change in the area. About 84.4% of the respondents were able to identify the changes that have been occurring in the area (Figure 4). Furthermore, they were asked to identify assets which were affected by climate change. Findings showed that, almost 81.11% mentioned natural wells as the most affected assets while 13.33% identified traditional clothes and caves (Table 3).

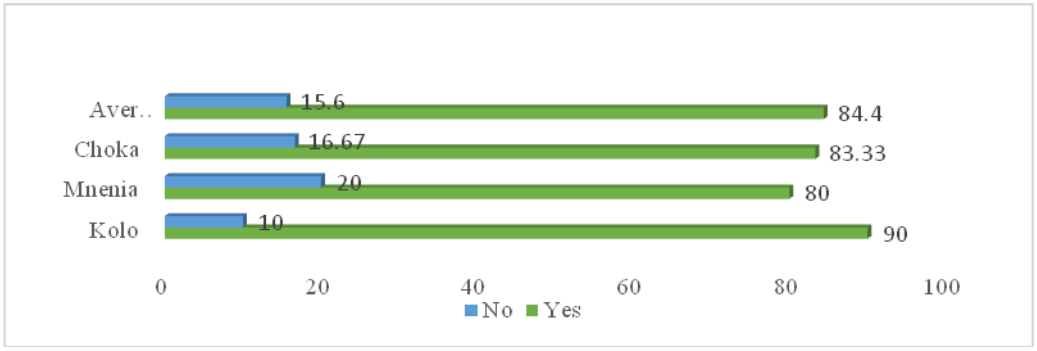

Figure 4: Awareness on the changes of cultural tourism assets due to climate change

Table 3: Changing assets due to climate change (%)

	Wells n=30		Huts n=30		Clothes n=30		Caves/Rocks n=30	
	Yes	No	Yes	No	Yes	No	Yes	No
Kolo	83.33	16.67	36.67	63.33	20	80	20	80
Mnenia	76.67	23.33	33.33	66.67	3.33	96.67	3.33	96.67
Choka	83.33	16.67	36.67	63.33	16.67	83.33	3.33	96.67
Total	243.33	56.67	106.67	193.3	40	260	26.66	273.3
Average	81.1	18.9	35.6	64.4	13.3	86.7	13.3	91.1

Respondents have further identified the changes faced those cultural assets due to climate change. Findings revealed that, 49.9% of them have identified the loss of water as the main

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change that occurred to the natural wells which had influenced their disappearance. Also, 34.44% have identified destruction of traditional huts, caves and rock arts. About 15.56% have similarly identified the change of wearing styles due to increased warming as shown in Table 4.

Table 4: Changes facing cultural assets due to climate change (%)

	Responses			
Changes	Kolo	Mnenia	Choka	Average
	n=30	n=30	n=30	
Loss of water	43.33	73.33	33.33	49.9
Damage of rocks, huts and caves	40	23.33	40	34.4
Change of wearing style	16.67	3.33	26.67	15.6

We have also explored the climate change stressors exacerbated changes to the cultural tourism assets. Findings disclosed four main stressors (Table 5). The first was drought (42.22%) which had influenced disappearance of natural wells as more heat evaporated them. The second involved winds (23.33%) fueled the changes of tradition huts (‘*tembe’*) such that most of them fail to stay longer. The third stressor encompassed temperature/heat waves (12.22%) led people to wear less dress to cope with usual warm condition. The same stressor led menace to food crops as less harvests were obtained. The fourth stressor was an eruption of erratic rains which causes flooding which latter erode the rock paints and the food crops. It has erode the traditional huts (*‘tembe’*) for *Rangi* and *Sandawe* tribes in the area. Our further discussions with Agriculture Extension Officer who stationed at Kolo ward supervising the three villages of this study had this to cement;

> *“It is real my sons that millet, sorghum and maize crops together with livestock in our villages are aggravated by increasing temperature, abnormal winds, and inadequate rains which are also uncertain as years goes on. The situation is complex even to me as an expert as when I compare to the past when I was young, I see greater changes. Surely, our future is uncertain my sons”.*

Table 5: Climate change stressors influencing changes on cultural assets (%)

	Responses			
Effects	Kolo	Mnenia	Choka	Average
	n=30	n=30	n=30	
Drought	43.33	36.67	46.67	42.2
Erratic rains	16.67	26. 67	23.33	20
Wind	20	30	20	23.3
Temperature	20	6.67	10	12.2

The above respondents observations relates with those of Sabine and Sylivia, (2014) that climate change is increasingly posing threat to the protection of world heritage. It affects cultural heritage, as well as natural heritage, posing a threat of biodiversity. Furthermore, climate change

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is likely to affect cultural diversity and socio-cultural interactions by forcing communities to change their work habits and ways of life, to compete for resources or to migrate elsewhere. At Tanzanian level, those results are consistently furthermore with the reports of NAPA, (2007) and USAID, (2018) that climate change stressors (i.e. increased temperature and evaporation rates and heat wave duration, as well as increased frequency and intensity of heavy rainfall) pose threats to Tanzanian tourism.

3.4 Effects of the changes of assets on cultural tourism

Finally, an attempt was made to assess the effects posed by climate change stressors to cultural tourism. To achieve this, respondents were requested to identify and elaborate them. Results show that different types of cultural assets are susceptible to the effects of climate change to a varying degree. Among the effects, findings depicted that the changes have resulted into the changing of traditional dressing style mainly of *Rangi* and *Sandawe* tribes (Table 6). The former dress (‘*rubega’*) dressed up by those communities in the area has been changing to modern dresses partly due to increasing heat which makes them need alternative clothes. Regardless that even globalization may somewhat influence the changing of dresses, they still hold that it was mostly due to escalating hot climate. The changing of dresses from local to modern entailing reduction of local attraction by visitors whose interests lies on local clothes. The changes faced local people in Kolo, Mnenia and Choka villages concede the views presented by Kjellstrom *et al.*, (2009) that climate change is likely to affect cultural diversity and socio-cultural interactions by forcing communities to change their work habits and ways of life. The same was observed to the *Masai* community by Asilia Africa, (2017).

Table 6: Effects of the changes of cultural assets on cultural tourism

	Villages				
Changes	**Kolo**	**Mnenia**	**Choka**	**Total**	**Average****
Changed dressing style	73	86.6	43.3	202.8	67.6
Changed traditional foods	53	60	83.3	196.3	65.4
Changed usage of local brews	63.3	80	73.3	216.6	72.2
Disappearance of natural wells	83.3	93.9	80	257.2	85.7

**=multiple response

At the same time, climate change has been ravaging the usage of local foods that have been previously used (Table 7). They had ascertained that increased pets and diseases, and drought have pushed people to cultivate modern species of food crops (maize and millet) which were not in the area in the past and have no the flavor as the traditional species. The aim is to cope/adapt with food insecurity due to climate change. For that reasons, the traditional foods (such as ‘*mlenda’ and ‘kirumbu’*) are disappearing hence reduce attraction to the visitors who have interests on local foods. The challenge of food changes due to climate change is in relative with

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the arguments posed by FAO, (2008) that climate change have affected the four dimensions of food security: food availability, food accessibility, food utilization and food systems stability. So in terms of food systems, we realized the changes in Kolo, Mnenia and Choka villages.

Other chaos of climate change on cultural tourism in the area dwelt on local brews. We have found that crops like millets and sorghums which mainly used for making local brews underwent less harvests due to erratic and unpredictable rains. Therefore, the harvests are mostly used for food than local brews hence they have been losing attraction at that juncture. The same claims were remarked to the decline of maize which was also used for making local brews ('*komoni'*). One elder had this to say when administer him questionnaire;

> *"..Listen to me, I was famous here in Mnenia in making 'komoni' (local brew made of maize) since 1980's. Its taste was super, but nowadays the taste is not good as we are using your (we researchers) new generation maize species which grows faster like mushrooms……"*

Interestingly, the issue of local brews has similarly reported elsewhere differently. A study by Wei, *et al*, (2018) informs that there is a decrease in global beer supply due to extreme drought and heat. It is mainly because these extreme events have been causing substantial decrease in barley yield worldwide.

Further, we had also found that climate change has been causing the disappearance of the natural wells which were the hubs in the past to provide water for domestic uses as well as those wells were used for rituals and for rain making/prayers. Following the rapid pace to lose them, the same threat goes on losing the attraction for tourists. Now people are pushed to get water from the modern drilled wells (mostly wind mills) which are not their tradition. This scenario indicates that in the study area, as natural wells gradually disappears, more and more households begins to face water shortage if the drilled wells are not many enough to meet the demand (domestic and for livestock). Joseph and Kaswamila (2017) have also discusses the ramification of climate change on water shortage in Longido district mainly to pastoralists. They found that their natural wells, ponds and seasonal rivers dried due to drought.

4.0 Conclusion

The results of the research revealed that cultural assets like other environmental resources and like other man's activities are devastated by climate change. Surely, for cultural tourism, climate change is not a remote event, but a phenomenon that already impacts the sector in different settings. It is likely that temperature, rainfall and wind will affect decisions by tourists to travel to Kondoa in the forthcoming nearby years. After this, the impacts of climate on travel patterns to the area will be uncertain. With escalating climate change and its destructive effects on cultural tourism, building resilience has to be a way to prediction and adapt. The aim is to create

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an opportunity for development, absorbing shocks and accruing benefits from changes. Yet, the future is unpredictable and full of surprises, managing the resilience and adaptation may reduce livelihood vulnerability of cultural tourism dependents. People need to be educated on how best to adapt and cope with the consequences of climate change to cultural assets and the environment in totality so as to sustain the operation of cultural tourism. Also, there should be carbon offset programs which will allow travelers and foreigners to mitigate the carbon footprints of their travels through funding for a carbon reduction program whereby these funds and payments will help in various campaigns and activities of reducing carbon into the atmosphere. Also, a study should be also done to assess the adaptation pathways that suits for local people in the area to pursue so as to have both sustainable livelihood and resilient cultural tourism against varying and changing climate.

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