Perceived Effects of Waterfalls on the Livelihood Outcome of Rural Households around Waterfalls in Southwest Nigeria

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Abstract

A waterfall is a natural endowment that has both functional and aesthetic values. Most waterfalls are located in rural communities where residents depend on the resources of the environment for their livelihood. However, the potential of waterfalls as an agricultural resource and tourist attraction that can enhance the livelihood of rural residents has been under-researched. Using three prominent waterfalls, Olumirin, Arinta and Ayikunugba, this paper examined the perceived effects of waterfalls on the livelihood outcome of rural households in Southwest Nigeria. Three hundred and twelve (312) respondents were selected from five communities adjoining the waterfalls using simple random sampling. Questionnaires, key informant interviews and focus group discussions were employed to collect data from respondents. More than half of the respondents perceived waterfalls to have little effect on economic growth, while 53.8% and 51.3% perceived that waterfalls have more effect on socio-cultural values and environmental conservation, respectively. Most (75.0%) of the respondents were food secure, while 52.6% were more vulnerable to livelihood shocks and 53.5% had low sustainable use of natural resources. Overall, 57.7% of the respondents had low

livelihood outcomes. This study suggests that the environment is an important livelihood resource among rural residents, hence the perception of benefits and costs in relation to the use of the environment influences the livelihood outcomes of rural residents.

Keywords: perceived effects, tourism, waterfalls, livelihood outcome

Introduction

Rural communities have numerous natural and cultural resources that are harnessed for livelihood in their environment. Some examples of these resources include land for agriculture, water resources for domestic and agricultural uses and scenic landscape for aesthetic view (Acharya, 2004; Bronisz and Jakubowski, 2017). Although rural dwellers are predominantly farmers, non-farm livelihood activities are increasingly being practiced to improve their standard of living (Esu, 2008; Eneyew and Mengistu, 2013; Fox and Sohnesen, 2016).

Livelihood refers to the various resources and processes through which people earn their living. The concept of livelihood has been widely adopted in agriculture, food security and development studies. One of the most popular approaches to the study of livelihood is the sustainable livelihood framework. The framework has been lauded for its comprehensive approach to the study of the assets, strategies and enabling environments that support the activities of people in sustaining their livelihood.

Many livelihood studies have adopted the sustainable livelihood framework approach (Ellis, 1999; Shen, Hughey, and Simmons, 2008; Tao and Wall, 2009; Iorio and Corsale, 2010; Trædala and Vedeld, 2018) to describe the process of improving the livelihood outcome of people. The livelihood asset of most rural communities is based on their natural resources which are expressed as farm and non-farm livelihood strategies. In rural communities, residents mostly practice diversification of economic activity to boost their sources of income. Ewebiyi and Meludu (2013) recommend non-farm livelihood diversification as a means for rural communities to enhance their livelihood.

Waterfalls are natural endowments that provide functional and aesthetic benefits to people (Hudson, 2006). Bennett and Dearden (2014)

describe natural assets as the primary stock through which resources that are useful for livelihood are derived. Mountains, valleys, tablelands, water bodies and ecological features (flora and fauna) are attributes of waterfalls that generate benefits to residents of the community. Therefore, some features such as water, forest and arable land which surround waterfalls serve as a means to eke out a living in most rural communities. Furthermore, most waterfalls have spectacular scenery and possess a combination of features such as valleys, mountains, lakes and waterfalls from various heights that are not widely distributed in nature (Hudson, 2006). In addition to being a basic resource for livelihood, waterfalls also provide people with pristine and natural resources for relaxation, leisure, and tourism. Hence, the natural environment is ascribed collective value based on the people's daily experiences, history, decisions for settlement, government institutions, and available infrastructure (Andereck and Nyaupane, 2011; Méndez-Lemus and Vieyra, 2017).

The development of waterfalls for tourism provides benefits as well as poses threats to a community's livelihood. In nature-based tourism destinations, the ecosystem supplies residents with a rich resource base to meet their needs. Apart from the primary attraction (natural environment), other features such as culture, hospitality, and infrastructure in the community contribute to the attractiveness of tourism destinations (Truong, Lenglet and Mothe, 2018). These attributes play a major role in the host community's everyday life and establish tourism as a shared industry between the guests and the host communities. As tourists interact with the host communities, the livelihood activities and lifestyle of residents change to accommodate tourism as an economic activity, which complements their traditional livelihood activities (Mbaiwa, 2011).

Rural dwellers directly benefit from the natural resources in their community as a means of sustenance (Bryceson, 2000). Like farming, tourism destinations are also susceptible to various risks which may contribute to livelihood vulnerability (Iorio and Corsale, 2010; Mbaiwa, 2011; Hoefle, 2016). Socio-economic indicators were used to assess the vulnerability factors. The benefits that can accrue to a community from tourism development include improved infrastructure such as healthcare, education and ability to diversify their livelihood activities.

Residents' perception of tourism is shaped based on certain conditions. As tourism impacts on all aspects of human life, the dimensions of tourism influence have often been categorized into economic, socio-cultural and environmental effects. These dimensions have been associated with both benefits and costs in tourism communities. Benefits such as increased income, more job opportunities, preservation of cultural values, communal pride and conservation of the natural environment are often reported in tourism. However, negative impacts such as income and employment leakages, social vices, and environmental degradation are also reported.

Nature-based destinations have unique involvement by the host communities as major stakeholders in the tourism development process. This is because the main attraction spots marked as tourism destinations may no longer be easily accessible to the residents of the host community. The environment which is the major livelihood stock of residents becomes a shared resource between the residents and the tourism industry. Hence, the effect of tourism on the livelihoods of rural residents is usually an important indicator of the livelihood outcome of residents. However, the potential of waterfalls as an agricultural resource and tourist attraction that can enhance the livelihood of rural residents has been under-researched.

Methodology

The study adopted a survey research design. A multistage sampling technique was used to select 312 respondents from five adjoining communities around three major waterfalls in Southwest Nigeria. The three major waterfalls (Olumirin, Arinta and Ayikunugba) were purposively selected based on their status as tourist destinations. Five communities within a 10km radius were also purposively selected based on their proximity to the waterfalls. Furthermore, simple random sampling was used to select respondents as representatives of households. Questionnaire, focus group discussion (FGD) and key informant interview were the tools used for data collection to aid triangulation. Community leaders were interviewed as key informants based on their relationship with the tourism management authorities in the study area while focus group discussions were conducted with occupational groups.

The perceived effects of waterfalls on the community were measured using economic, social and environmental variables assessed with a five-point Likert-type scale. The livelihood outcome of rural residents was tested by adopting three indicators of livelihood outcome – food security, reduced vulnerability and sustainable use of natural resource base – as identified by Shen, Hughey, and Simmons (2008). A mean score was obtained to categorize the level of rural households' livelihood outcome into high or low. The quantitative data collected were analysed using frequency counts, percentages, factor analysis and Pearson product moment correlation (PPMC), while qualitative data were content analysed.

Results and Discussion

Perceived effects of waterfalls

The factor analysis of perceived effects variables was conducted and the Kaiser-Meyer-Olkin (KMO) sample adequacy result revealed a 0.600 level of significance and Bartlett's Test of Sphericity was χ^2= 4607.97, $p<0.000$. The reduction by principal component was suitable to analyse the perceived effects of residents around waterfall destinations in Southwest Nigeria.

Six out of the eighteen variables accounted for 80.90% of the total variance at an Eigenvalue of ≥1. The factors in the first component accounted for 22.46%, second component 21.03%, third component 13.19%, fourth component 11.45%, while the fifth and sixth components were 6.88% and 5.89% respectively.

The result on factor analysis rotated matrix (Table 1) revealed the strong factors in component one to include: conservation of natural resources (0.768), enhanced sense of common history among residents (0.759), enhanced diversity of nature (0.745), improved trust among community members (0.673), and enhanced preservation of the ecosystem (0.621). The strong factors in the second component were tourists' interest in local food (0.744), effect on environmental pollution (0.603), extinction of cultural values (0.600), and conflict between host and guest (0.624). Other components within the acceptable factor loading were influence on agricultural activities (0.664) and improvement of infrastructure (0.620). The factor analysis revealed that eleven factors can

adequately describe the perceived effects of waterfall destinations among residents of host communities in Southwest Nigeria.

Table 1: Perceived effects of waterfalls

Component Matrix[a]						
	Component					
	1	2	3	4	5	6
Improved infrastructure	-.454	.354	.620	.061	.099	-.397
Increased income	-.105	.113	.322	.592	.557	-.306
Affected agricultural activities	-.075	-.210	.072	.664	.095	.503
Improved the economy	.261	.042	.347	.513	.313	.346
Contributed to social vices	-.453	.358	.448	.214	-.413	-.137
Increased prices of goods and services	-.259	.340	.434	.078	-.518	.458
Extinction of cultural values	-.100	.600	-.613	.318	.036	.038
Conflict between guest and the host community	-.225	.624	-.578	.347	-.046	-.118
Fair distribution of tourism benefits	.198	.690	.374	-.120	.220	.011
Increased tourist interest in local food	.340	.744	.238	-.270	.047	.159
Enhanced sense of common history	.759	.299	.338	.018	-.065	.005
Improved trust among community members	.673	.039	.270	-.169	-.141	-.191
Increased environmental pollution	-.347	.603	-.304	.387	-.308	-.186
conservation of natural resources	.768	.501	-.247	-.027	.069	.091
Sustained diversity of nature	.745	.472	-.295	-.078	.062	-.007
Preserved the ecosystem	.621	.066	.183	.442	-.332	-.201
Loss of fauna and flora in the community	-.560	.556	.044	-.324	.235	.161
Overexploitation of natural resources for livelihood	-.521	.581	.047	-.393	.158	.145

Extraction Method: Principal Component Analysis.

a. 6 components extracted.

Source: Survey (2018).

The perceived effects of waterfalls on the livelihood of rural households were operationalized using economic, socio-cultural and

environmental indicators. Respondents opined that tourism does not have a negative effect on agricultural activities. This connotes cultural sustainability as tourism co-exists with agriculture, which is the major traditional economic activity in the community. This result was corroborated during the FGD by one of the discussants who submitted that, "*Tourism activities do not restrict us from using our farmland nor affect soil fertility*" (FGD, Oke-Ila community, 2018). One of the key informants added that, "*The landscape in this community favours agricultural production because we have access to water all year round. Apart from the waterfall, there are several rivers that enhance vegetable production*" (KII, Ipole-Iloro community, 2018).

With respect to socio-cultural effects, respondents opined that tourism does not give rise to social vices in their local communities and does not lead to conflict between guest and host communities. This suggests that rural households do not have a negative disposition to the development of tourism. Hence, they are likely to participate in and support the growth of tourism development. This assertion is further validated by the findings of Martín, de los Salmones Sanchez and Herrero (2018) who reported that host communities are likely to support tourism if they perceive low negative impacts of tourism development.

However, rural households disagreed that there has been fair distribution of tourism benefits among residents of the community (Table 1b). It can be inferred from this finding that rural households have not felt much impact of tourism revenue in their community. This view was expressed by one of the discussants during the FGD who claimed that "*… the waterfall would have been a source of revenue to further develop the community, but it is controlled and managed by the government. So, we do not feel the impact of the revenue generated in our community*" (FGD discussant, Ipole-Iloro, 2018).

Nevertheless, rural households agreed (see Table 1b) that tourism contributes to the conservation of natural resources. This suggests that the rural households appreciate the presence of the waterfalls and participate in conserving the natural resources. This was stated by an informant who believes that "*The waterfall is a divine gift and a magnificent display of mystical power. We believe that the gods have entrusted us with such great treasure that has made this community popular all over the world. It is our*

pride and collective responsibility to protect the resource base." (KII, Erin-Oke, 2018)

Table 1b: Distribution of respondents based on level of perceived effects of waterfalls

	Less effect	More effect	Minimum	Maximum	Mean	Std. Deviation
Economic growth	186(59.6)	126(40.4)	8.00	20.00	17.4	2.6
Socio-cultural values	144(46.2)	168(53.8)	22.00	40.00	30.0	5.6
Environmental conservation	152(48.7)	160(51.3)	10.00	30.00	21.6	4.6
Overall	158(50.6)	154(49.4)	40.00	90.00	69.1	10.3

Source: Field survey, 2018.

Reiterating the importance of the waterfall to the community, one of the key informants noted aptly, *"We are proud of our asset base in this community. The beautiful and serene landscape is so unique that the federal government has listed the waterfall as one of the tourist centres in Nigeria. This has contributed to community pride and sense of belonging to protect the waterfall as our heritage. Also, hunting and tree felling activities are restricted at the waterfall premises. Similarly, there are consequences for violating environmental laws in the community."* (KII, Ipole-Iloro, 2018)

Livelihood outcome

Food security

The results (Appendix 1) reveal that few of the rural households eat smaller meals in a day ($\bar{x}$=0.43), go a whole day without eating ($\bar{x}$=0.42), go to sleep hungry ($\bar{x}$=0.21) or eat fewer meals in a day ($\bar{x}$=0.29). There is thus a high level of food security (75.0%) among rural households in waterfall destinations in Southwest Nigeria (Table 2). The high level of food security could be linked to the high level of natural capital such as land, water and forest resources which enhances agricultural activities or food production. This implies that the existence of the waterfall contributes to the socio-economic status of the community. This result agrees with the findings of Otunaiya and

Ibidunni (2014) who reported that rural households who engage in farming as a primary livelihood activity are food secure.

Table 2: Distribution of respondents by level of food security around waterfall destinations

Level of food security	Freq.	%	Minimum value	Maximum value	Mean
Food insecure	78	25.0	0	23.0	3.82±6.74
Food secure	234	75.0			

Source: Field survey, 2018.

Livelihood vulnerability

Rural households were more vulnerable to earning from tourism activities ($\bar{x}$=2.36), low income from non-agricultural activities ($\bar{x}$=2.13), access to health services ($\bar{x}$=2.09) and accessing support from social network in the community ($\bar{x}$=1.77) as shown in Appendix II. Limited livelihood diversification, tourism infrastructure and remoteness of the communities may be the reason for rural household's vulnerability. This result agrees with Adepoju, Yusuf, Omonona and Okunmadewa (2011), who found that rural households with less income-generating activities are vulnerable to livelihood shocks.

Livelihood vulnerability was further profiled as less and more vulnerable. Table 3 reveals that 52.6% of the rural households in communities around waterfall destinations in Southwest Nigeria were more vulnerable to livelihood shocks. The high level of vulnerability could be attributed to the seasonal nature of agriculture and tourism activities in the study area.

Table 3: Respondents' level of livelihood vulnerability

	Freq.	%	Minimum value	Maximum value	Mean
Less vulnerable	148	47.4	12	60	48.60±8.76
More vulnerable	164	52.6			

Source: Field survey, 2018.

Sustainable use of natural resources

The use of natural resources indicates unsustainable use (Appendix III) with respect to extinction of wildlife and biodiversity ($\bar{x} = 2.04$), increased deforestation ($\bar{x} = 2.01$), poor reforestation practice ($\bar{x} = 1.98$) and extraction of non-timber forest products ($\bar{x} = 1.76$). Further information obtained from FGD revealed that not all 'timber contractors' replant trees according to the law by which they operate. One of the respondents informed that "*… it is difficult to get seedling or nursery of some tree species that are being harvested. So, the timber contractors just plant any other tree in place of the ones they have harvested*" (FGD, Oke-Ila community, 2018).

Another discussant noted that the effect of the activities of lumbers is already being felt by residents in the community stating that "*In times past, the trees act as wind breaker for houses in the community. So, you will hardly hear of wind causing damage to houses and rooftops. Nowadays, we can only hope for safety when there are high winds*" (FGD, Ipole-Iloro community, 2018).

From the aforementioned, it can be deduced that residents are yet to attribute negative environmental effects to tourism (Table 1b). The negative environmental effects reported could be attributed to other livelihood activities linked to the use of natural resources such as lumbering and harvesting of non-timber forest products. This is in agreement with the position of Jenner and Smith (1992) that tourism is not solely responsible for negative impacts in host communities. This implies that other factors could be responsible for the unsustainable use of environmental resources.

Table 4 shows that 53.5% of the rural households were below the mean score, indicating a low level of sustainable use of natural resources among rural households in communities around waterfalls in Southwest Nigeria. This finding is not unexpected as there is low engagement in sustainable reforestation practices in the communities. This finding is in line with Gbadegesin and Olorunfemi (2011) who found that rural households in Southwest Nigeria exploit forest resources without adequate afforestation plans.

Table 4: Respondents' level of sustainable use of natural resources

	Freq.	%	Minimum value	Maximum value	Mean
Low	167	53.5	12	22	16.80±2.00
High	145	46.5			

Source: Field survey, 2018.

Level of livelihood outcome

The level of livelihood outcome was low among 57.7% of the rural households around waterfalls in Southwest Nigeria (Table 5). The low level of livelihood outcome may not be unconnected with their vulnerability to income from non-agricultural sources, access to healthcare facilities, ability to earn from tourism and the unsustainable use of environmental resources.

Table 5: Respondents' level of livelihood outcome

	Freq.	%	Minimum value	Maximum value	Mean
Low	180	57.7	0.00	82.73	40.51±17.61
High	132	42.3			

Source: Field survey, 2018.

Relationship between perceived effects of waterfall and livelihood outcome of rural households

Table 6 shows a significant ($p<0.05$) association between perceived economic effects of waterfalls ($r=0.275$), perceived socio-cultural effects of waterfalls ($r=0.276$) and livelihood outcome of rural households around waterfall destinations in Southwest Nigeria. This implies that as perceived economic and socio-cultural effects increase, so will the livelihood outcome of rural households around these destinations. However, perceived environmental effects of waterfalls revealed a negative and weak association with livelihood outcome ($r=-0.027$). This connotes an inverse relationship between perceived environmental effects and livelihood outcome such that as perceived environmental effect increases, livelihood outcome will decrease and vice versa.

Table 6: Pearson's correlation matrix of perceived effects of waterfalls and livelihood outcome of rural households

Variables		Perceived economic effects of waterfalls	Perceived socio-cultural effects of waterfalls	Perceived environmental effects of waterfalls	Perceived effects of waterfalls	Livelihood outcome
Perceived economic effects of waterfalls	Pearson Correlation	1	.216**	.016	.376**	.275**
	Sig. (2-tailed)		.000	.784	.000	.000
	N	312	312	312	312	312
Perceived socio-cultural effects of waterfalls	Pearson Correlation	.216**	1	.743**	.939**	.276**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	312	312	312	312	312
Perceived environmental effects of waterfalls	Pearson Correlation	.016	.743**	1	.863**	-.027
	Sig. (2-tailed)	.784	.000		.000	.639
	N	312	312	312	312	312
perceived effects of waterfalls	Pearson Correlation	.376**	.939**	.863**	1	.208**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	312	312	312	312	312
Livelihood outcome	Pearson Correlation	.275**	.276**	-.027	.208**	1
	Sig. (2-tailed)	.000	.000	.639	.000	
	N	312	312	312	312	312

** Correlation is significant at the 0.01 level (2-tailed)

Source: Field survey, 2018

The overall perceived effects of waterfalls show a significant ($p<0.05$) relationship between perceived effects of waterfalls and livelihood outcome of rural households ($r=0.208$). This suggests that a positive disposition towards economic, socio-cultural and environmental effects of waterfalls may likely improve the livelihood outcome of rural households around waterfalls in Southwest Nigeria. This affirms the findings of Koki (2017) that a significant positive influence exists between nature-based tourism and the livelihood of rural households.

Conclusion

The findings of this study have reemphasized that rural communities depend on the production and consumption of environmental resources for their livelihood outcome. Although tourism is proposed as an alternative livelihood activity in both developed and developing countries, the benefits that rural households around waterfall destinations enjoy from tourism is relatively low. The potential of tourism to create additional economic earnings in the host communities was not a popular opinion among the respondents. Rather, the sociocultural and environmental effects of tourism were the common variables of tourism development around the waterfall communities.

On the livelihood outcome of residents in the study area, food security was the only high indicator among the respondents. This suggests that the respondents were food secure. However, the respondents had a high level of livelihood vulnerability. This could be attributed to dependence on farming as a major livelihood activity and the seasonal nature of farm output and the tourism industry. Incorporating alternative livelihood activities could help cushion the shocks associated with seasonality in agricultural output and tourism.

On one hand, tourism is seen to contribute positively to environmental conservation because the natural resources in the waterfall destinations are protected from illegal harvesting. However, there are concerns about lumbering and other negative environmental practices in the communities. These concerns are not attributed to tourism development but to other livelihood activities that depend on the resources of the environment. Hence, there is a need for integrated management of the environment to accommodate all producers and consumers of the ecosystem.

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Appendix I: Distribution of respondents according to food security*

Indicators/Items	Never F(%)	Rarely F(%)	Sometimes F(%)	Mean
Worry about food	229(73.4)	49(15.7)	34(10.9)	0.69
Unable to eat preferred foods	234(75.0)	18(5.8)	60(19.2)	0.56
Just eat a few kinds of food	239(76.6)	15(4.8)	58(18.6)	0.52
Eat foods they do not want to eat	242(77.6)	17(5.4)	53(17.0)	0.50
Eat smaller meal	249(79.8)	8(2.6)	55(17.6)	0.43
Eat fewer meals in a day	271(86.9)	10(3.2)	31(9.9)	0.29
No food of any kind in the household	282(90.4)	4(1.3)	26(8.3)	0.21
Go to sleep hungry	282(90.4)	4(1.3)	26(8.3)	0.21
Go a whole day and night without eating	260(83.3)	26(8.3)	26(8.3)	0.42

Source: Field survey, 2018.

*Household Food Insecurity Access Scale (HFIAS) by Food and Nutrition Technical Assistance (FANTA) was adopted for the study

Appendix II: Distribution of respondents based on degree of vulnerability

Degree of vulnerability	DG F (%)	DS F (%)	SS F (%)	IS F (%)	IG F (%)	Mean	Std. Dev.
Income from non-agricultural sources	146(46.8)	104(33.3)	0(0.0)	22(7.1)	40(12.8)	2.13	1.21
Access to healthcare facilities	109(34.9)	133(42.6)	17(5.4)	39(12.6)	14(4.5)	2.09	1.34
Access to training	48(15.4)	54(17.3)	63(20.2)	84(26.9)	63(20.2)	3.19	1.35
Crop yields	16(5.1)	7(2.2)	64(20.5)	88(28.3)	137(43.9)	4.04	1.10
Access to continuous water supply	13(4.1)	9(2.9)	9(2.9)	54(17.3)	227(72.8)	4.52	0.99
Ability to earn from tourism activities	79(25.4)	118(37.8)	35(11.2)	35(11.2)	45(14.4)	2.36	1.40
Access to food resources	9(2.8)	12(3.8)	3(1.0)	105(33.7)	183(58.7)	4.41	0.92
Current housing unit	9(2.9)	11(3.5)	25(8.0)	119(38.1)	148(47.5)	4.24	0.95
Income from agricultural sources	13(4.2)	32(10.3)	19(6.1)	114(36.5)	134(42.9)	4.04	1.13
Support from social networks in the community	118(37.8)	150(48.1)	24(7.7)	13(4.2)	7(2.2)	1.77	0.99
Family connectedness	13(4.1)	9(2.9)	5(1.6)	107(34.3)	178(57.1)	4.37	0.97
Access to information from other communities	13(4.2)	12(3.8)	17(5.4)	145(46.5)	125(40.1)	4.14	0.98
Grand mean = 4.05							

Source: Field survey, 2018.

Key: DG- Decreased Greatly, DS- Decreased Slightly, SS- Stay the Same, IS- Increased Slightly, IG- Increased Greatly

Appendix III: Distribution of respondents based on sustainable use of natural resources

Use of natural resources	Low F (%)	Moderate F (%)	High F (%)	Mean	Std. Dev.
Reforestation/planting of trees	136(43.6)	45(14.4)	131(42.0)	1.98	0.93
Soil fertility	150(48.1)	35(11.2)	127(40.7)	2.07	0.94
Air pollution	139(44.5)	32(10.3)	141(45.2)	2.18	0.93
Water quality	29(9.3)	120(38.5)	163(52.2)	2.43	0.66
Deforestation	168(53.8)	32(10.3)	112(35.9)	2.01	0.95
Access and use of land	50(16.0)	120(38.5)	142(45.5)	2.29	0.73
Extraction of non-timber forest products	96(30.8)	46(14.7)	170(54.5)	1.76	0.89
Extinction of wildlife and biodiversity	144(46.1)	38(12.2)	130(41.7)	2.04	0.94

Source: Field survey, 2018.