

Flood disasters and management in Ughelli and environs, Delta State, Nigeria

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Abstract

The study examines the 2022 floods disasters in Ughelli and environs, Nigeria. Field survey of 25 communities affected by flood disaster in Ughelli north and south Local Government Areas (LGA) were carried to measure the inundated areas and their levels (depth). Questionnaires were also administered to solicit the causes, effect of flood, and management strategies adopted during the flood episodes. Data were presented and analyzed with statistical diagrams and descriptive statistics. Results revealed high level of flood inundation and disasters in Ughelli north and south of Delta State, with a colossal and devastating damage on properties and lives. Properties worth 616.3 million and 573 million of worth of crops were destroyed. And socioeconomic activities come to a standstill. Heavy rainfall, release of water from Lagdo dam in Cameroun amongst others are the causal factors of the disaster. The study posited building of buffer dams, adhering to NiMet weather prediction, and planning regulations among others as the flood management options.

Keyword: Flood, disaster, properties, management, Ughelli

Introduction

Flood is the occurrence of water in a place that is supposedly dry (Efe, 2007). The occurrence of flood has been enunciated over the years (see Efe, 2010, 2011; Efe & Mogborukor, 2010, Efe, 2014, Elenwo & Efe, 2014, Brammer, 2021). But its effect continued unabated over the years (Efe, 2013 & Elenwo & Efe, 2014). For instance, the 2012 flood episode brought colossal loss to the inhabitants of Nigeria, most especially within the basins of the Benue and Niger rivers in Nigeria (Efe, 2014). Upon this, there were calls for periodic evaluation of flood scenarios in various states and regions in Nigeria in order to finding a lasting management solution to it.

In 2022, there is a reoccurrence of 2012 flood with similar devastating effect (see fig. 1), that the government and the Nigerian now regard it as the worst flood in this decade. For instance, Nigeria has been suffering from severe flooding and windstorms since June 2022 (ECHO

12/07/2022, Maclean, 2022). 33 states in Nigeria have been impacted by flooding as of October 6, 2022). Jigawa, Anambra, Bayelsa, Cross River, Delta, and Rivers in southern Nigeria and the Federal Capital Territory in the center of the country are the states most severely impacted (ECHO 18/10/2022). Over 2.5 million people had been impacted as of October 20th by the crisis, which had forced over 1.4 million people to flee their homes (Maclean, 2022, Reuters 20/10/2022a; Al Jazeera 17/10/2022). According to reports, Bayelsa State was one of the worst hits, with about 700,000 people affected or displaced as of 18 October (ECHO 18/10/2022). Also, as of October 18, there had been 603 fatalities, more than 2,400 injuries, nearly 1,303,000 displaced people, and more than 2,504,000 affected people nationwide. With 203,400 damaged houses, of which over 82,000 have been completely destroyed. (Akbarzai; Smith, & McCluskey, 2022, & ECHO, 2022)



Fig 1: Flooded Area in 2022 in Delta State, Nigeria

In Delta state, over 46 communities in the Ughelli North and Ughelli South Local Government Areas (LGA) are currently under water, displacing numerous families and destroying goods and property worth tens of millions of Naira, many communities became inaccessible (see fig. 2), and five deaths recorded. The inhabitants therefore called on the Delta State Government, the National Emergency Management Agency (NEMA) and global humanitarian authorities to come to their aid and rescue as well (Ogunyemi, 2022). This disaster was corroborated by the Delta state government when he stated during his visit to the flooded area, that Delta state is one of the worst hit states in Nigeria with 19 of her twenty-five local governments experiencing devastating effects of flood disasters in 2022.

Arising from the above calls for more studies, and the reoccurrence of flood disaster after a decade, this study examines floods disaster in Ughelli and environs. Nigeria.

Material and methods study

The study was conducted in Ughelli and environs which comprises of Ughelli north and south Local Government Areas (LGA) of Delta State, Nigeria. At the time of the 2006 census, Ughelli north had a population of 321,028 and an area of 818 km². It is the third largest L.G.A in Delta State. Its DD

5.3435 5.95108 and DMS 5°20'36.60" N 5°57'3.89" E. Ughelli south LGA is the Delta State's fourth most populous local government. According to the 2006 census, it had a land area of 786 square kilometers (303 sq mi) and a population of 213,576. Both LGAs are located at an elevation of 45 meters above sea level (Eduvie, 2017, and Ovwigho and Ifie, 019). The low-lying location precipitated the occurrence of flood.

The data utilized for this study were obtained from field measurement of the flooded area and level of inundations with measuring tapes, and graduated meter levelling sticks. This is was done with the aid of research assistants. The services of canoe pilots were deployed who took the researchers with their assistants to the study sites. Also, 400 questionnaires were distributed to the first 16 persons met at the site of measurement in the twenty-five communities used for the study. This approach is in tandem with Efe (2007), and Odionkhere and Efe. (2020). The questionnaires were deployed to obtain data on flood effects, causes and management strategies adopted in the area.

Results and discussion

The data obtained for the study are presented in table 1-5, Figures 2-4 and discussed below.

Table 1: Flooded Areas

<i>S/N</i>	<i>Areas</i>	<i>Flooded portion (Km²)</i>	<i>Depth (M)</i>	<i>Periodicity (Weeks)</i>	<i>Category</i>
1	Orogun	1.94	0.85	3-6	Single-event
2	Agbarho	1.67	1.19	2-3	Pondage
3	Ughelli	3.65	0.74	2-3	Single event
4	Afiesere	1.43	1.45	2-5	Flash
5	Ofuoma	1.20	0.94	3-4	Flash/pondage
6	Agbarha-Otor	1.15	1.06	3-6	Single event
7	Uwheru	1.26	0.95	2-4	Flash
8	Ekrejebor	2.52	1.50	4-6	Flash/Single event
9	Ogor	1.65	1.33	3-4	Pondage
10	Ewu	2.23	1.5	3-5	Single event
11	Evwreni	2.40	1.60	4-6	Single event
12	Oteri	1.98	1;50	4-6	Single event
13	Uduere	1.86	1.47	3-5	Single event
14	Imode	2.43	1.52	3-5	Single event
15	Egbo-Uhurie	2.18	1.54	4-6	Single event
16	Ophorigbala	2.78	1.60	4-7	Single event
17	Ekakpamre	2.42	1.61	4-6	Single event
18	Otokutu	3.01	1.70	3-5	Single event
19	Ekrejegbo	2.56	1.50	4-7	Single event
20	Ekrokpe	2.50	1.65	4-7	Single event
21	Iyara	2.38	1.67	3-6	Single event
22	Oginibo	3.76	1.80	4-8	Single event
23	Urhiephron	2.87	1.76	3-7	Single event
24	Okwagbe	3.83	1.87	4-8	Single event
25	Olomu	2.54	1.04	4-6	Single event
	Mean	3.25	1.62	3-6	Single event

Table 1 showed the flood characteristics in Ughelli and its environs of Delta state. This indicates high level of inundation with mean flood depth of 1.41m (see Fig 4), an area of 58.2 Km², and characterized with preponderance single-event flood. It takes 4 weeks to 6 weeks for cessation the flood water, and subsequently dry up. (See figure

2). This corroborated the work of (Efe & Mogborukor, 2010, Elenwo & Efe 2014), who earlier posited similar flood characteristics in the cities of Warri in Delta state and Port Harcourt, Rivers State respectively. The detail of the Flood characteristics in each community are well enunciated in table 1.



Fig. 2: Houses and roads inundated in Ughelli and environs.



Fig. 3: Houses and markets inundated in Ughelli and environs

Other communities in Ughelli South that have been devastated by flood in 2022 are Otu-Jeremi,, Oguname-Olomu, Oviri-Olomu , Okwagbe, Okparabe, Otor, Ewu, Effurun-Otor Akperhe-Olomu, , Oginibo,

Iwhekekan, Omafuvwe, Okpare-Olomu, and Assah. By October 18, 2022. These areas were inundated to an average depth of 1.5m, displacing most inhabitants to IDP camps

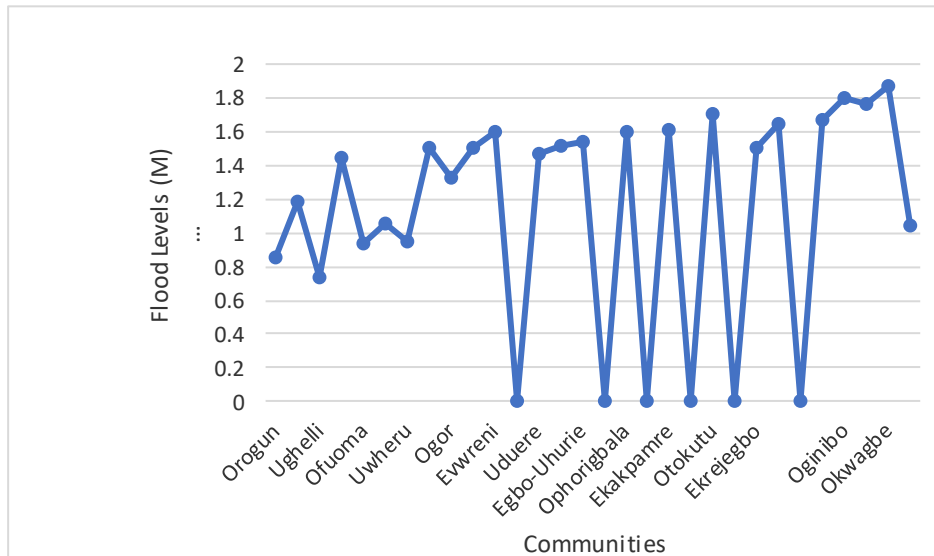


Fig 4: Level of Inundation in Ughelli and environs

The impact of flood on the inhabitants of Ughelli North and south local government area are listed in table 2. Over 60% of the respondents generally asserted that the things affected by flood in the area are: loss of farm produces, destruction of properties, food insecurity, despoliation of buildings, closure business and transportation activities, closure of School and worship centers, destruction of market and shop

wares, causes road traffic accident, pollution of surface water, lower the cost of rentage on properties, destruction of electrical installation thereby causing total black out, people displaced to camps, traffic congestion, lateness to school and work, blockage of drains, devalued the cost of landed properties. loss of life, and destruction of landscape,

Table 2: Flood Effects in Ughelli and Environs

<i>S/N</i>	<i>Effects</i>	<i>Yes</i>	<i>No</i>	<i>%</i>
1	Loss of farm produces	400	00	100
2.	Destruction of properties	400	00	100
3	Food insecurity	400	00	100
4.	Loss of Life	250	150	63
5.	Despoliation of building	400	00	100
6	Destruction of landscape	238	162	60
7.	Closure business and transportation activities	400	00	100
8	Traffic congestion	369	31	92
9.	Devalue the cost of landed properties	245	55	61
10	Lateness to work and school work	350	50	88
11	Closure of School and Worship Centers	400	00	100
12.	Destruction of shops and Market wares	400	00	100
13.	Accident (Cars and Vehicles Veered off the road)	400	00	100
14	Devalued the cost of rentage of properties (houses, shops)	400	00	100
15.	Blockage of drains	320	80	80
16	Pollution water sources for domestic use	400	00	100
17	Total Blackout and destruction electrical installations	400	00	100
18	Displacement of people	400	00	100

Fieldwork. 2022

From table 3, other properties affected and estimated cost showed a total of 1336 houses, 549 shops, 330 workshops, 27 schools, and 152 churches affected by flood in 2022. It amounts to estimated cost of 612.3 million naira during this period. The details of the effects in each community are

enunciated in table 3. The inhabitants asserted that it is a dark October 2022 where socioeconomic activities came to a standstill, life lost, crops worth over 573 million destroyed and many displaced from their houses of abode.

Table 3: Properties affected and estimated cost

Zone	<i>Properties affected</i>						Estimated cost (₦) (Million)
	Areas	Houses	Shops	Workshops	Schools	Churches	
1	Orogun	67	18	37	2	11	22.4
2	Agbarho	47	30	21	0	16	26.5
3	Ughelli	78	32	26	3	10	28.4
4	Afiesere	96	28	37	6	8	31.7
5	Ofuoma	51	20	26	5	5	18.9
6	Agbarha-Otor	144	59	43	0	6	51.4
7	Uwheru	116	53	20	0	7	23.2
8	Ekrejebo	56	6	3	0	3	19.8
9	Ogor	56	54	19	2	8	11.7
10	Ewu	78	21	15	2	6	27.8
11	Evwreni	150	25	27	2	8	28
12	Oteri	45	15	12	1	5	12.7
13	Uduere	14	10	0	0	2	11.6
14	Imode	21	15	0	0	3	23.4
15	Egbo-Uhurie	23	13	0	0	3	26.4
16	Ophorigbala	32	5	0	0	5	28
17	Ekakpamre	22	36	12	1	7	34.2
18	Otokutu	47	11	1	1	8	20.4
19	Ekrejegbo	35	20	11	0	5	22.5
20	Ekrokpe	18	12	16	0	6	20.7
21	Iyara	26	11	1	1	4	21.7
22	Oginibo	25	12	0	1	5	23.9
23	Urhiephron	34	19	0	0	3	31.4
24	Okwagbe	23	12	0	0	2	23
25	Olomu	32	12	3	0	6	22.6
	Total	1336	549	330	27	152	612.3

Source: Field work, 2022 **NB:** The cost is exclusive of crops destroyed

The factors that precipitated flood occurrence in Ughelli and environs are enunciated in table 4.

Table 4: Factors of Flood Occurrence

<i>Causes of flood</i>	<i>SA</i> <i>(4)</i>	<i>A (3)</i>	<i>D</i> <i>(2)</i>	<i>SD</i> <i>(1)</i>	<i>Total Weight /</i> <i>Respondents</i>	<i>WM</i>	<i>Decision</i>
<i>Release of Water from Dam</i>	294	100	5	1	1487 (400)	3.72	SA
<i>Heavy Rainfall</i>	300	97	2	1	1494 (400)	3,74	SA
<i>Dumping of refuse on drains</i>	240	150	5	5	1425 (400)	3.56	SA
<i>Impervious urban surface</i>	160	189	36	15	1294 (400)	3.2	A
<i>climate change</i>	212	167	11	10	1381 (400)	3.45	SA
<i>Building on waterways</i>	256	100	24	20	1392 (400)	3.48	SA
<i>Spiritual/anger of the god</i>	14	16	203	16	677 (400)	1.69	D
<i>Inadequate storm drains</i>	278	97	20	5	1448 (400)	3.62	SA
<i>Low topography</i>	220	110	40	30	1320 (400)	3.3	A
<i>Government policy</i>	250	100	30	20	1380 (400)	3.45	SA
<i>Absence of good drainage system</i>	282	88	12	13	1429 (400)	3.57	SA
<i>Non-Adherence to predictions</i>	213	98	49	40	1284 (400)	3.21	A
<i>Land reclamation</i>	12	20	200	16	676 (400)	1.69	D
<i>Noncompliance with regulations</i>	190	157	40	13	1324 (400)	3,31	A
<i>Sea level rise</i>	160	200	30	10	1200 (400)	328	A

NB: SA= strongly agreed A= Agree, D= Disagree, SD= strongly disagree

Heavy rainfall and release of water from the dam (Lagdo dam in Cameroun) were rated 1st and 2nd highest factors of flood, this indicate a weighted mean of 3.74 and 3,72. This revealed these are the major factors of flood in the area while the least rated factors are the land reclamation and anger of the gods (1.69). other factors in order of rating are: inadequate storm drains, absence of

drainages, indiscriminate dumping of waste on drains, building on water ways, climate change, government policy, Noncompliance planning regulations, Sea level rise low topography, non-adherence to weather prediction, and impervious urban surfaces. These had a weight mean rating that span 3, 57-3, 2. These corroborated Efe and Mogborukor (2010) and Elenwo and Efe (2014).

Table 5: Flood management options

<i>S/N</i>	<i>Management strategies</i>	<i>Yes</i>	<i>No</i>	<i>%</i>
1	Timely Flood forecast by NiMet	368	32	92
2	Monthly environmental sanitation / clearing of drainages	400	00	100
3	Relocate to upland	358	42	90
4	Proper waste disposal management	300	100	75
5	Adhering to planning regulations	280	20	70
6	Constituted flood disaster committee	230	170	58
7	Sensitization and awareness programme	250	150	63
8	Establishment of internally displayed people (IDP) camps	400	00	100
9	Constant provision of food and relief materials by government	220	180	55
10	Government provision of teachers to teach pupils in the IDP camps	150	250	38
11	Dredging of water channels by ministry of environment/ DESOPADEC	122	278	31
12	Building of dam	0	400	00
13	Taking proactive steps to avoid flood disaster forecasted by NiMet	121	278	30

Source: Fieldwork, 2022

Flood management strategies adopted by the inhabitants and government agencies are listed in table 5. The most frequently adopted flood adaptation options are monthly environmental sanitation / clearing of drainages and establishment of IDP camps with 100% adoption. The least adopted flood management measures are construction of dams, dredging of water ways, taking proactive steps to avoid flood disaster forecasted by NiMet and employment of teachers to teach the pupils so they will not loss out in their academics (0-38%). For other strategies adopted falls within 55% -92% see table 5. This corroborated Efe, 2011 and ECHO, October 18, 2022.

Conclusion

The study posited that there is the occurrence of flood disasters in Ughelli north and south of Delta State, Nigeria with a colossal and devastating damage on

properties and life. It was regarded by the inhabitants as a dark October 2022 where socioeconomic activities come to a standstill. The study established that heavy rainfall and release of water from Lagdo dam in Cameroun amongst others precipitated the flood disaster. Building of buffer dams, adhering to NiMet weather prediction for planning purposes among others should be practiced.

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