Crédit Image : ©ESA/Copernicus, Sentinel-2, 22 Mai 2021 (false colour composite)

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SAVING LIVES
CHANGING LIVES

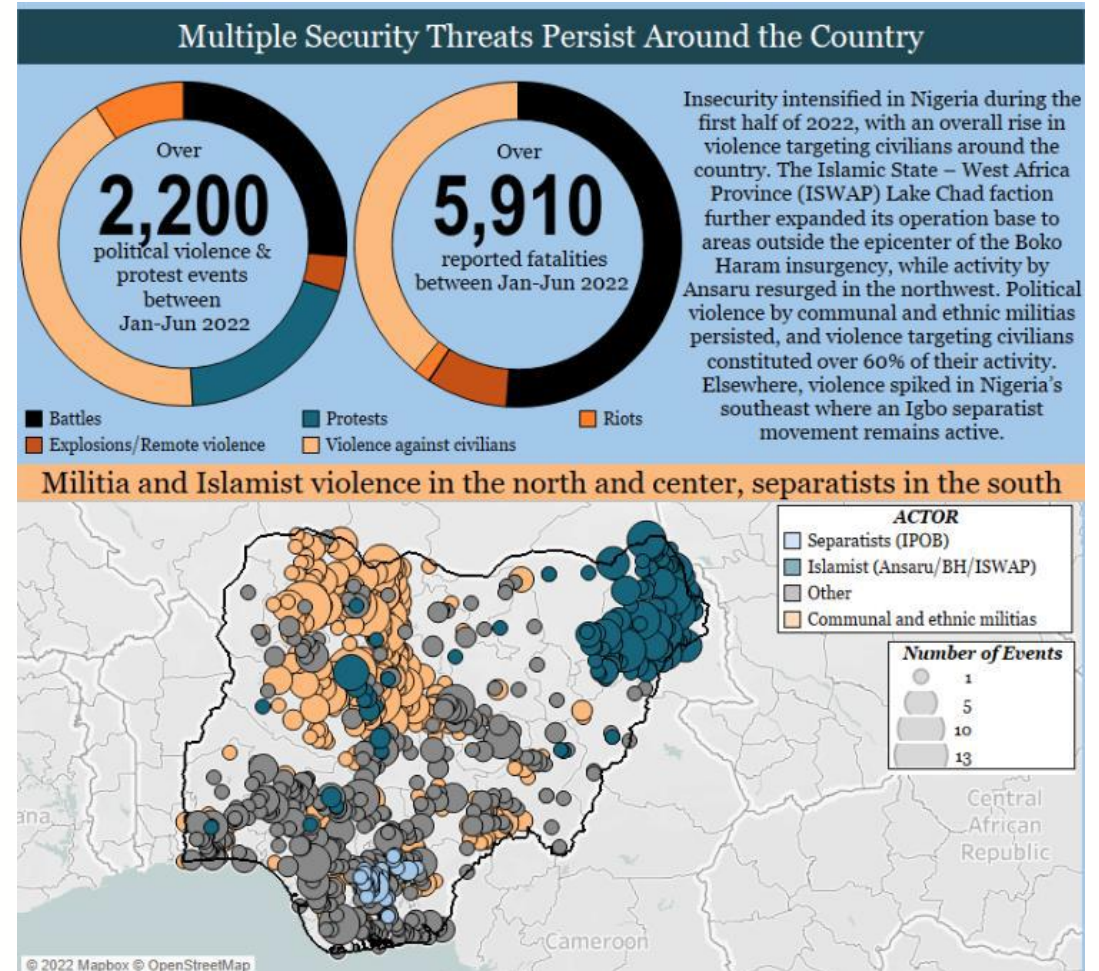# Nigeria: Cropland Change Dynamics
2022 Season

October 2022

CONTEXT: PERSISTENT INSECURITY IN NORTHERN NIGERIA
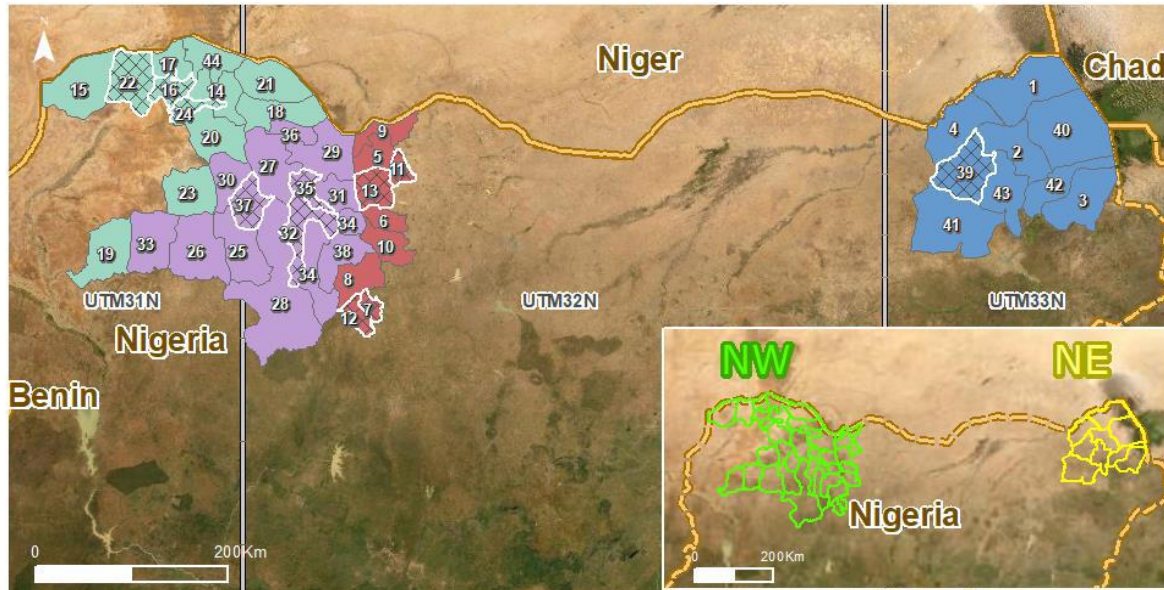
Issue:

Persistent insecurity in northern Nigeria continues to hamper agricultural monitoring, especially for hard-to-reach areas;

Proposal:

In collaboration with European Commission's Joint Research Centre (JRC)/Copernicus Emergency Management Service, WFP uses high-resolution satellite images to evaluate cropland changes in NW and NE areas

Multiple Security Threats Persist Around the Country

Over **2,200** political violence & protest events between Jan-Jun 2022

Over **5,910** reported fatalities between Jan-Jun 2022

Insecurity intensified in Nigeria during the first half of 2022, with an overall rise in violence targeting civilians around the country. The Islamic State – West Africa Province (ISWAP) Lake Chad faction further expanded its operation base to areas outside the epicenter of the Boko Haram insurgency, while activity by Ansaru resurged in the northwest. Political violence by communal and ethnic militias persisted, and violence targeting civilians constituted over 60% of their activity. Elsewhere, violence spiked in Nigeria's southeast where an Igbo separatist movement remains active.

- Battles
- Explosions/Remote violence
- Protests
- Violence against civilians
- Riots

Militia and Islamist violence in the north and center, separatists in the south

ACTOR
- Separatists (IPOB)
- Islamist (Ansaru/BH/ISWAP)
- Other
- Communal and ethnic militias

Number of Events
1
5
10
13

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2022 GEOGRAPHICAL SCOPE: AREAS OF INTEREST

The cropland change analysis for the 2022 rainy season covered 44 LGAs in north-eastern and north-western Nigeria, including:

- **Borno:** all LGAs in Borno North SD
- **Katsina:** selected LGAs in Katsina Central and Katsina South SDs
- **Sokoto:** all LGAs in Sokoto East SD and selected LGAs in Sokoto North and Sokoto South SDs
- **Zamfara:** all LGAs in Zamfara State (Zamfara North, Zamfara Central and Zamfara West SDs)

The Areas of Interest (AOIs) were selected based on their accessibility and the need for data to inform the October 2022 Cadre Harmonisé analysis.

Nigeria States
- Borno
- Katsina
- Sokoto
- Zamfara
- New analysis

World
- Country borders
- Zones UTM

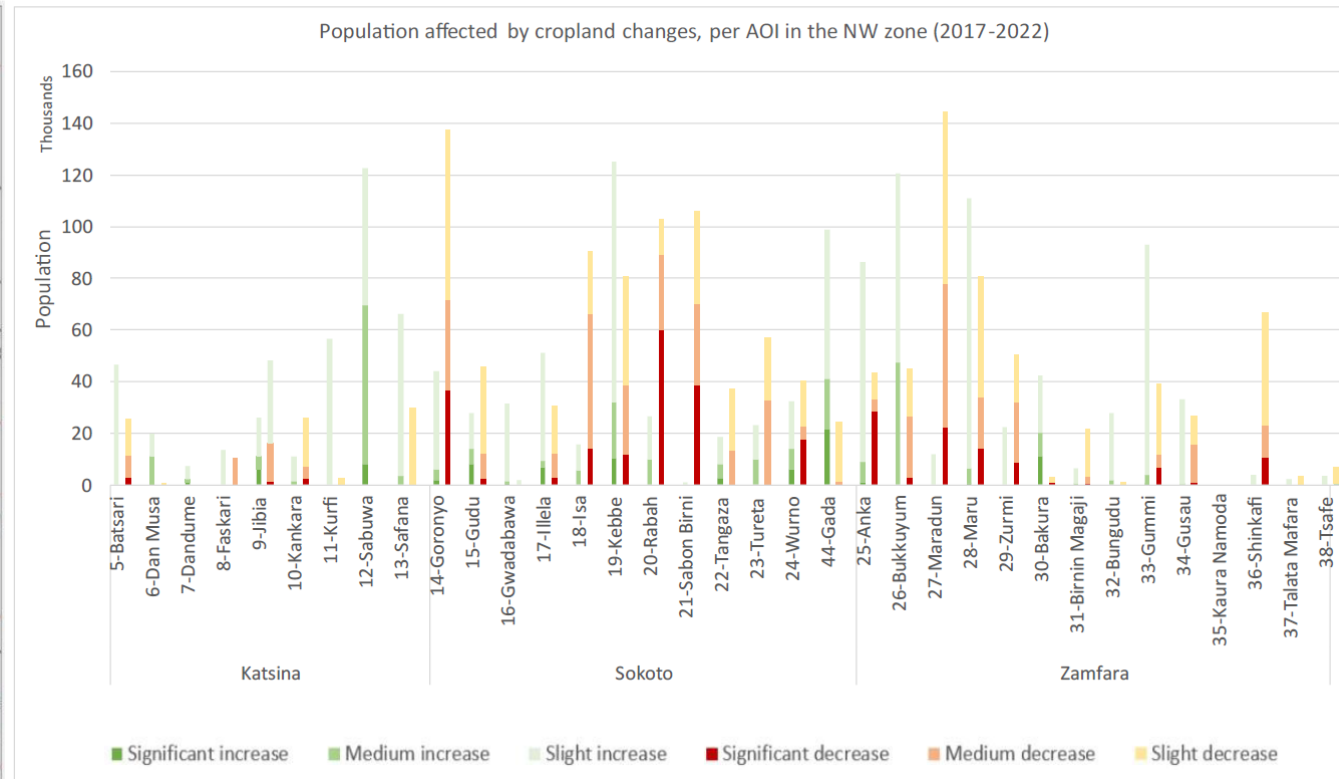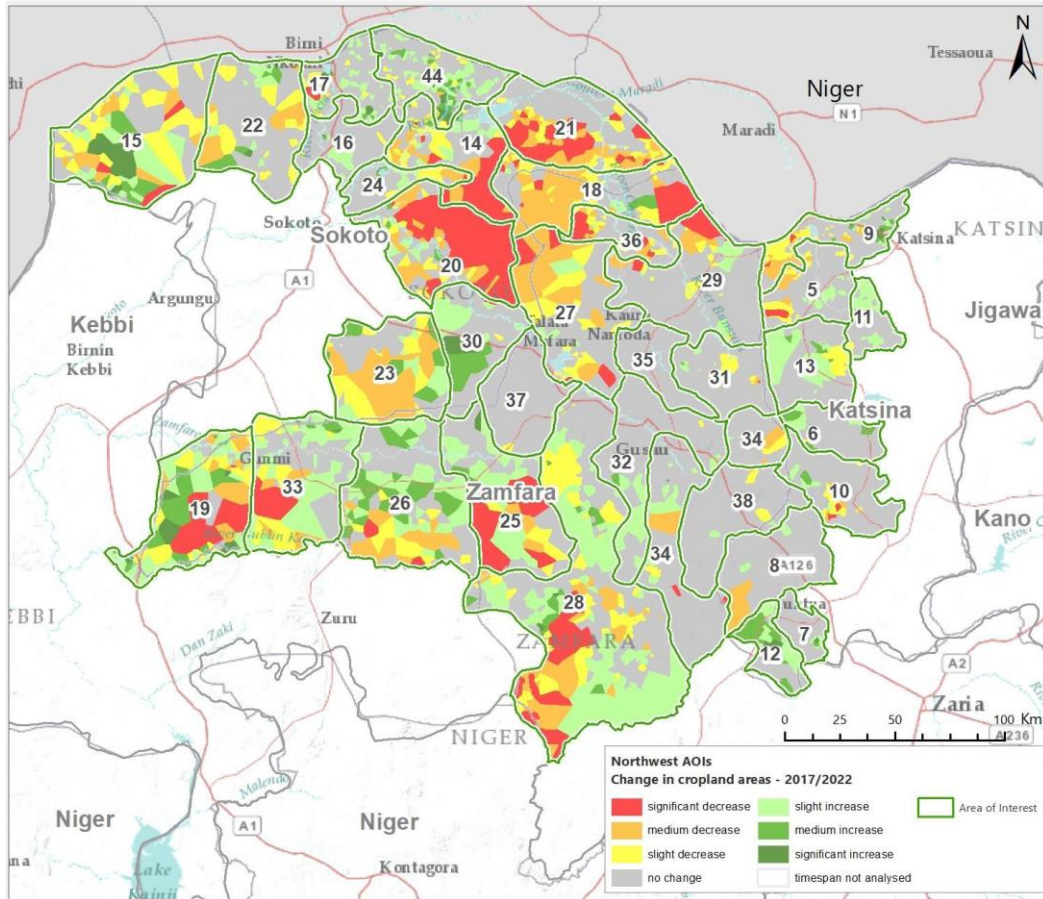| AOIS					
1-Abadam	8-Faskari	16-Gwadabawa	24-Wurno	32-Bungudu	40-Kukawa
2-Guzamala	9-Jibia	17-Illela	25-Anka	33-Gummi	41-Magumeri
3-Marte	10-Kankara	18-Isa	26-Bukkuyum	34-Gusau	42-Monguno
4-Mobbar	11-Kurfi	19-Kebbe	27-Maradun	35-Kaura-Namoda	43-Nganzai
5-Batsari	12-Sabuwa	20-Rabah	28-Maru	36-Shinkafi	44-Gada
6-Dan Musa	13-Safana	21-Sabon Birni	29-Zurmi	37-Talata Mafara	
7-Dandume	14-Goronyo	22-Tangaza	30-Bakura	38-Tsafe	
	15-Gudu	23-Tureta	31-Birnin Magaji	39-Gubio	

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METHODOLOGY

- Sentinel-2 is a land monitoring constellation of two identical satellites providing high resolution, high frequency, global coverage optical imagery. It covers the Earth's surface every 5 days, with 10m resolution.

- High-resolution satellite images (Sentinel-2, ESA/Copernicus) acquired between June 15 and October 15 are processed to detect cultivated land for each year of interest (current and baseline) – this theoretically covers the agricultural season, from land preparation to early stages of harvesting.

- The resolutions of this satellite imagery allows the detection of fields of any size and results at locality scale.

- Comparisons made with previous year and with pre-crisis period (2010 – NE; 2017 – NW)
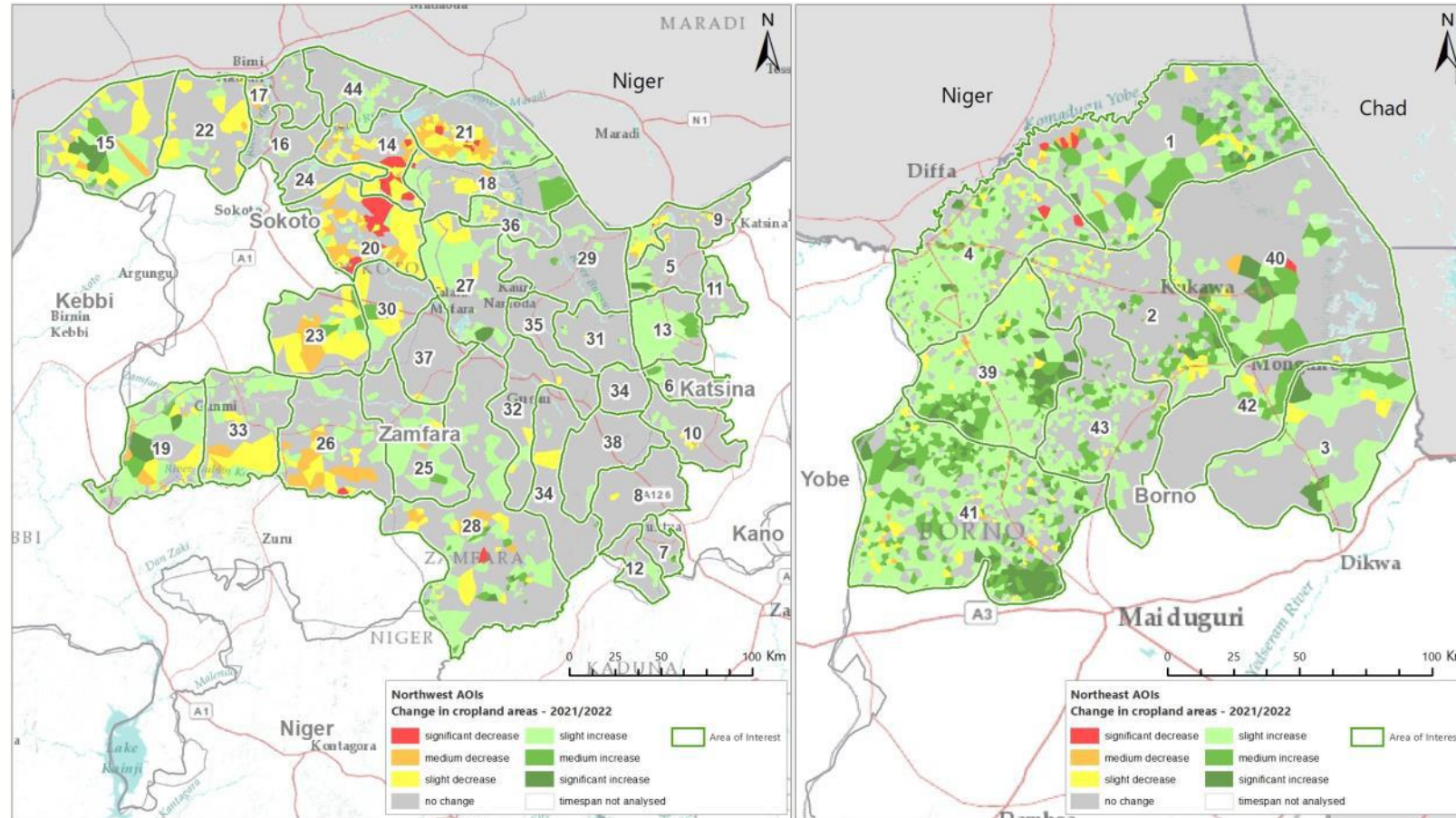
NE NIGERIA: 2022 VS PRE-CRISIS BASELINE (2010)
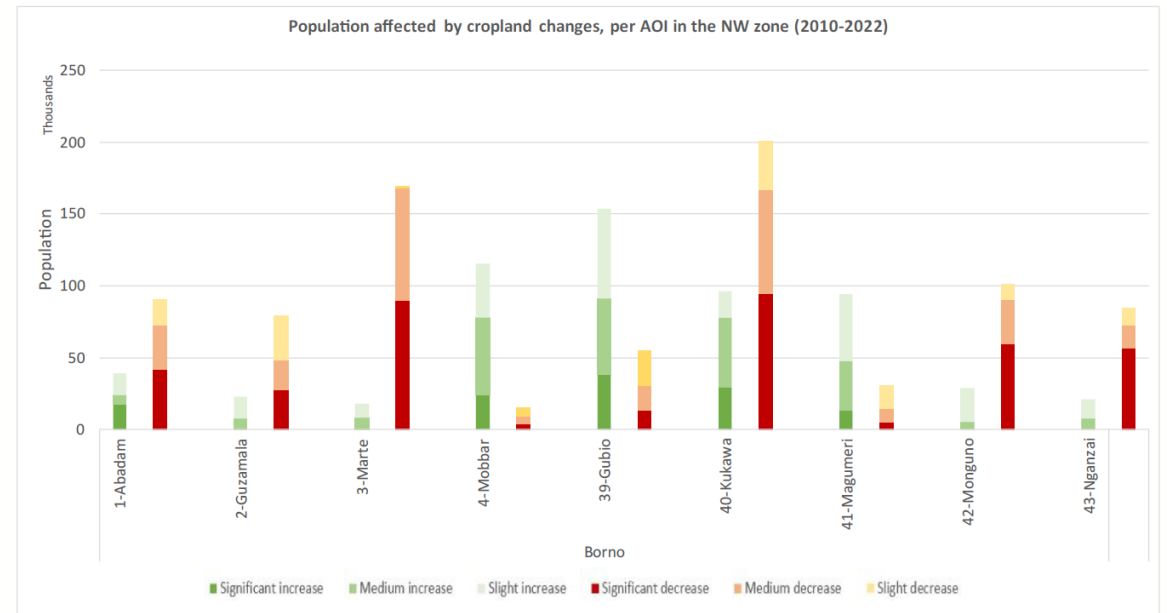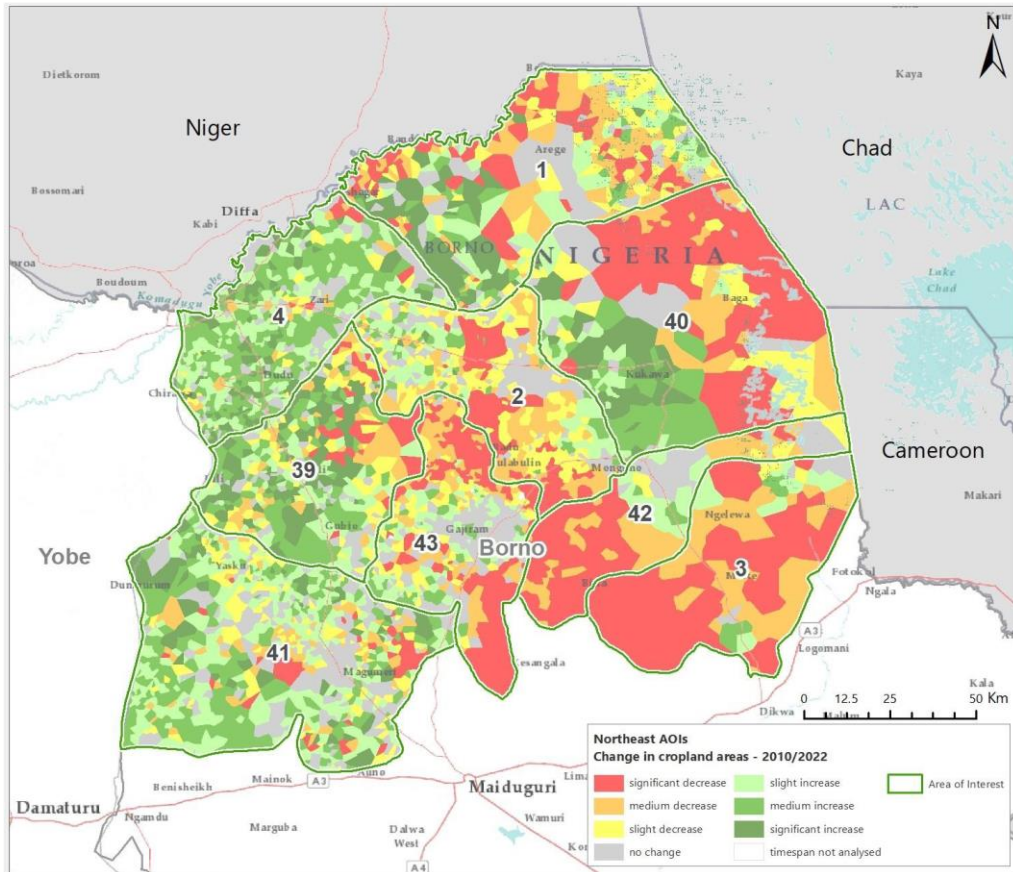
Northeast AOIs
Change in cropland areas - 2010/2022

- significant decrease
- medium decrease
- slight decrease
- no change
- slight increase
- medium increase
- significant increase
- timespan not analysed
- Area of Interest

Population affected by cropland changes, per AOI in the NW zone (2010-2022)

Borno

Significant increase ■ Medium increase ■ Slight increase ■ Significant decrease ■ Medium decrease ■ Slight decrease

Zone	AOI	Total Nb of sites	Significant increase		Medium increase		Slight increase		No change		Slight decrease		Medium decrease		Significant decrease		Population on 2020
			Nb of sites	%	Nb of sites	%	Nb of sites	%	Nb of sites	%	Nb of sites	%	Nb of sites	%	Nb of sites	%	
NE	1-Abadam	568	74	13.0%	66	11.6%	71	12.5%	54	9.5%	91	16.0%	108	19.0%	104	18.3%	150056
NE	2-Guzamala	1158	4	0.3%	75	6.5%	144	12.4%	175	15.1%	298	25.7%	268	23.1%	194	16.8%	122026
NE	3-Marte	232	0	0.0%	19	8.2%	20	8.6%	8	3.4%	5	2.2%	46	19.8%	134	57.8%	191622
NE	4-Mobbar	964	113	11.7%	355	36.8%	278	28.8%	143	14.8%	39	4.0%	25	2.6%	11	1.1%	159652
NE	39-Gubio	642	137	21.3%	126	19.6%	105	16.4%	70	10.9%	83	12.9%	60	9.3%	61	9.5%	228312
NE	40-Kukawa	426	74	17.4%	49	11.5%	45	10.6%	22	5.2%	32	7.5%	46	10.8%	158	37.1%	316224
NE	41-Magumeri	1637	84	5.1%	350	21.4%	489	29.9%	356	21.7%	197	12.0%	98	6.0%	63	3.8%	180119
NE	42-Monguno	292	0	0.0%	5	1.7%	27	9.2%	28	9.6%	10	3.4%	66	22.6%	156	53.4%	182512
NE	43-Nganzai	1541	0	0.0%	99	6.4%	178	11.6%	362	23.5%	181	11.7%	328	21.3%	393	25.5%	144910
	Total	7460	486	6.5%	1144	15.3%	1357	18.2%	1218	16.3%	936	12.5%	1045	14.0%	1274	17.1%	1675433

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NW NIGERIA: 2022 VS PRE-CRISIS BASELINE (2017)

Population affected by cropland changes, per AOI in the NW zone (2017-2022)

Northwest AOIs
Change in cropland areas - 2017/2022

significant decrease · slight increase · Area of Interest
medium decrease · medium increase
slight decrease · significant increase
no change · timespan not analysed

Significant increase · Medium increase · Slight increase · Significant decrease · Medium decrease · Slight decrease

Katsina · Sokoto · Zamfara

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NE & NW NIGERIA: 2022 VS PREVIOUS YEAR (2021)

Northwest AOIs
Change in cropland areas - 2021/2022

- significant decrease
- medium decrease
- slight decrease
- slight increase
- medium increase
- significant increase
- no change
- timespan not analysed
- Area of Interest

Northeast AOIs
Change in cropland areas - 2021/2022

- significant decrease
- medium decrease
- slight decrease
- slight increase
- medium increase
- significant increase
- no change
- timespan not analysed
- Area of Interest

Zone	AOI	Total Nb of sites
NE	1-Abadam	568
NE	2-Guzamala	1158
NE	3-Marte	232
NE	4-Mobbar	964
NE	39-Gubio	642
NE	40-Kukawa	426
NE	41-Magumeri	1637
NE	42-Monguno	292
NE	43-Nganzai	1541
TOTAL		7460
NW	5-Batsari	937
NW	6-Dan Musa	182
NW	7-Dandume	242
NW	8-Faskari	288
NW	9-Jibia	622
NW	10-Kankara	334
NW	11-Kurfi	188
NW	12-Sabuwa	99
NW	13-Safana	101
NW	14-Goronyo	186
NW	15-Gudu	175
NW	16-Gwadabawa	265
NW	17-Illela	205
NW	18-Isa	179
NW	19-Kebbe	145
NW	20-Rabah	200
NW	21-Sabon Birni	370
NW	22-Tangaza	184
NW	23-Tureta	131
NW	24-Wurno	131
NW	25-Anka	107
NW	26-Bukkuyum	156
NW	27-Maradun	282
NW	28-Maru	675
NW	29-Zurmi	428
NW	30-Bakura	107
NW	31-Birnin Magaji	202
NW	32-Bungudu	216
NW	33-Gummi	172
NW	34-Gusau	419
NW	35-Kaura Namoda	96
NW	36-Shinkafi	144
NW	37-Talata Mafara	75
NW	38-Tsafe	246
NW	44-Gada	373
TOTAL		8862

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BORNO — 2020 & 2021 HARVESTS COMPARED TO PREVIOUS YEARS
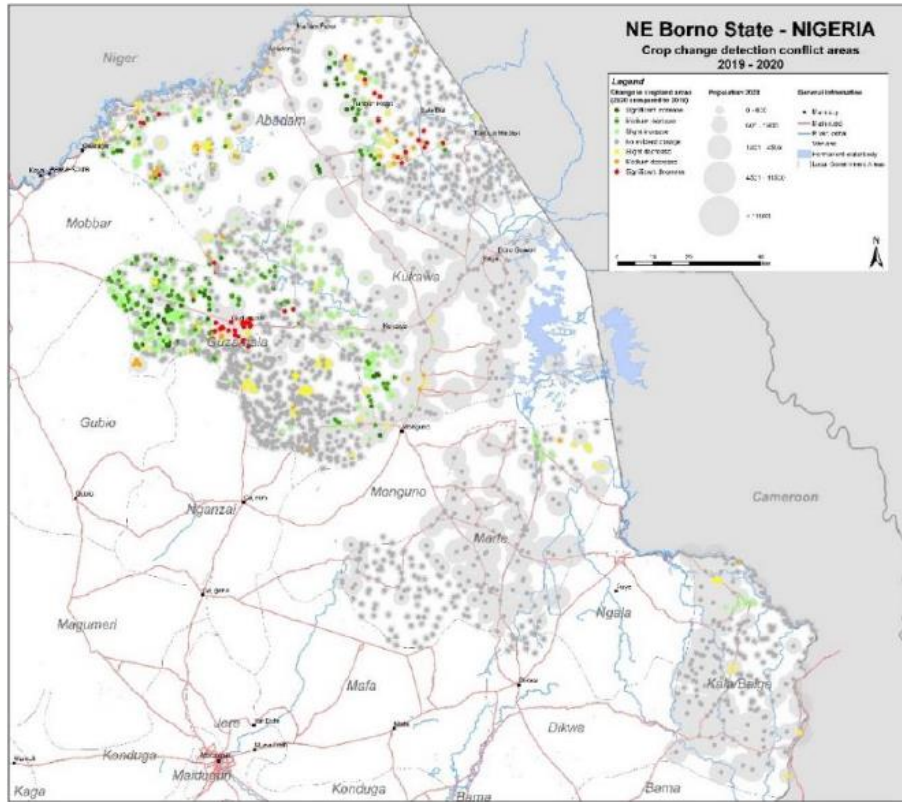
Map 3. Borno state, cropland change between 2020 and 2019

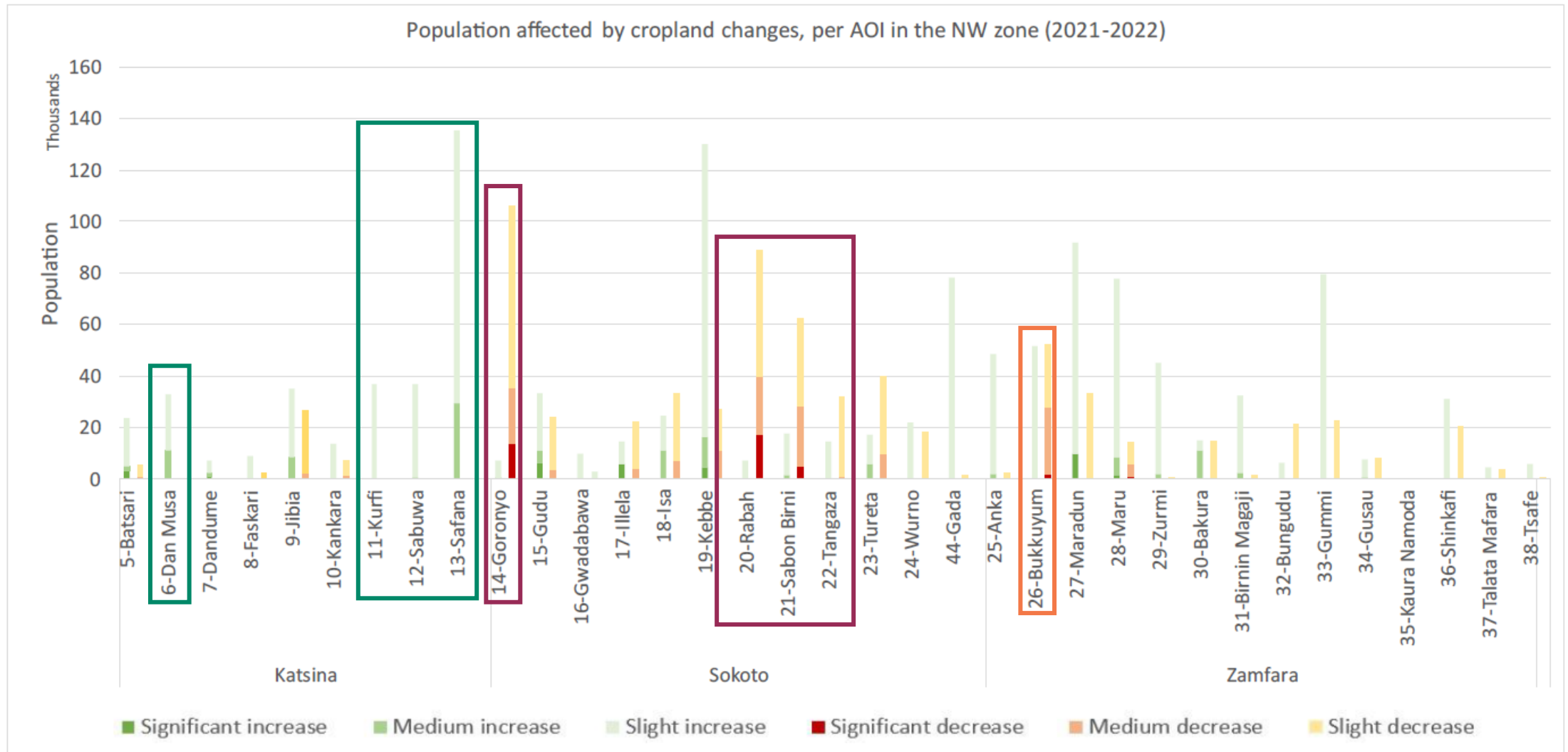Change between 2020 and 2019
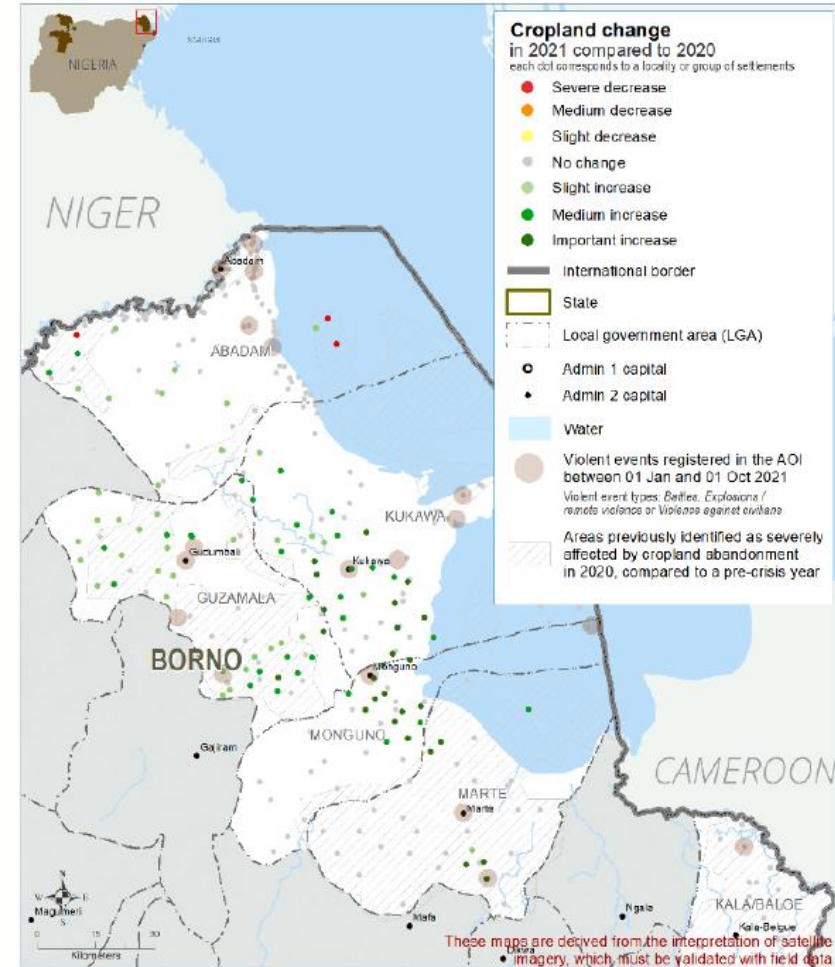
Change between 2021 and 2020

NE & NW NIGERIA: 2022 VS PREVIOUS YEAR (2021)

Zone	AOI	Total Nb of sites	Significant increase		Medium increase		Slight increase		No change		Slight decrease		Medium decrease		Significant decrease		Population 2020
			Nb of sites	%	Nb of sites	%	Nb of sites	%	Nb of sites	%	Nb of sites	%	Nb of sites	%	Nb of sites	%	
NE	1-Abadam	568	17	3.0%	77	13.6%	144	25.4%	292	51.4%	29	5.1%	6	1.1%	3	0.5%	150056
NE	2-Guzamala	1158	25	2.2%	76	6.6%	230	19.9%	771	66.6%	56	4.8%	0	0.0%	0	0.0%	122026
NE	3-Marte	232	14	6.0%	16	6.9%	60	25.9%	134	57.8%	8	3.4%	0	0.0%	0	0.0%	191622
NE	4-Mobbar	964	7	0.7%	57	5.9%	600	62.2%	276	28.6%	20	2.1%	2	0.2%	2	0.2%	159652
NE	39-Gubio	642	49	7.6%	92	14.3%	410	63.9%	68	10.6%	19	3.0%	4	0.6%	0	0.0%	228312
NE	40-Kukawa	426	15	3.5%	41	9.6%	67	15.7%	291	68.3%	9	2.1%	2	0.5%	1	0.2%	316224
NE	41-Magumeri	1637	80	4.9%	314	19.2%	729	44.5%	430	26.3%	76	4.6%	8	0.5%	0	0.0%	180119
NE	42-Monguno	292	0	0.0%	18	6.2%	25	8.6%	242	82.9%	6	2.1%	1	0.3%	0	0.0%	182512
NE	43-Nganzai	1541	0	0.0%	134	8.7%	362	23.5%	1037	67.3%	8	0.5%	0	0.0%	0	0.0%	144910
	TOTAL	7460	207	3%	825	11%	2627	35%	3541	47%	231	3%	23	0%	6	0%	1675433
NW	5-Batsari	937	2	0.2%	8	0.9%	37	3.9%	882	94.1%	7	0.7%	1	0.1%	0	0.0%	296737
NW	6-Dan Musa	182	0	0.0%	5	2.7%	13	7.1%	164	90.1%	0	0.0%	0	0.0%	0	0.0%	169518
NW	7-Dandume	242	1	0.4%	2	0.8%	7	2.9%	232	95.9%	0	0.0%	0	0.0%	0	0.0%	228447
NW	8-Faskari	288	0	0.0%	0	0.0%	2	0.7%	285	99.0%	1	0.3%	0	0.0%	0	0.0%	272569
NW	9-Jibia	622	0	0.0%	4	0.6%	35	5.6%	546	87.8%	30	4.8%	6	1.0%	1	0.2%	241066
NW	10-Kankara	334	0	0.0%	0	0.0%	9	2.7%	313	93.7%	10	3.0%	2	0.6%	0	0.0%	333513
NW	11-Kurfi	188	0	0.0%	0	0.0%	16	8.5%	172	91.5%	0	0.0%	0	0.0%	0	0.0%	174519
NW	12-Sabuwa	99	0	0.0%	1	1.0%	12	12.1%	86	86.9%	0	0.0%	0	0.0%	0	0.0%	195715
NW	13-Safana	101	0	0.0%	3	3.0%	14	13.9%	84	83.2%	0	0.0%	0	0.0%	0	0.0%	263896
NW	14-Goronyo	186	0	0.0%	1	0.5%	5	2.7%	119	64.0%	38	20.4%	14	7.5%	9	4.8%	286594
NW	15-Gudu	175	4	2.3%	8	4.6%	32	18.3%	98	56.0%	27	15.4%	6	3.4%	0	0.0%	110955
NW	16-Gwadabawa	265	0	0.0%	0	0.0%	8	3.0%	254	95.8%	3	1.1%	0	0.0%	0	0.0%	304235
NW	17-Illela	205	1	0.5%	0	0.0%	13	6.3%	182	88.8%	7	3.4%	2	1.0%	0	0.0%	325491
NW	18-Isa	179	0	0.0%	1	0.6%	32	17.9%	108	60.3%	29	16.2%	8	4.5%	1	0.6%	225862
NW	19-Kebbe	145	3	2.1%	5	3.4%	57	39.3%	60	41.4%	15	10.3%	5	3.4%	0	0.0%	259150
NW	20-Rabah	200	0	0.0%	0	0.0%	6	3.0%	101	50.5%	46	23.0%	24	12.0%	23	11.5%	205519
NW	21-Sabon Birni	370	0	0.0%	5	1.4%	35	9.5%	234	63.2%	55	14.9%	36	9.7%	5	1.4%	320549
NW	22-Tangaza	184	0	0.0%	0	0.0%	10	5.4%	148	80.4%	25	13.6%	1	0.5%	0	0.0%	149275
NW	23-Tureta	131	0	0.0%	5	3.8%	14	10.7%	88	67.2%	19	14.5%	5	3.8%	0	0.0%	171866
NW	24-Wurno	131	0	0.0%	0	0.0%	10	7.6%	112	85.5%	9	6.9%	0	0.0%	0	0.0%	265988
NW	25-Anka	107	0	0.0%	1	0.9%	20	18.7%	84	78.5%	1	0.9%	1	0.9%	0	0.0%	241758
NW	26-Bukkuyum	156	0	0.0%	0	0.0%	22	14.1%	98	62.8%	17	10.9%	18	11.5%	1	0.6%	307403
NW	27-Maradun	282	1	0.4%	0	0.0%	41	14.5%	233	82.6%	7	2.5%	0	0.0%	0	0.0%	406705
NW	28-Maru	675	5	0.7%	15	2.2%	150	22.2%	476	70.5%	16	2.4%	10	1.5%	3	0.4%	406295
NW	29-Zurmi	428	0	0.0%	1	0.2%	38	8.9%	388	90.7%	1	0.2%	0	0.0%	0	0.0%	408173
NW	30-Bakura	107	0	0.0%	1	0.9%	3	2.8%	98	91.6%	5	4.7%	0	0.0%	0	0.0%	190432
NW	31-Birnin Magaji	202	0	0.0%	4	2.0%	14	6.9%	180	89.1%	3	1.5%	1	0.5%	0	0.0%	300017
NW	32-Bungudu	216	0	0.0%	0	0.0%	3	1.4%	209	96.8%	4	1.9%	0	0.0%	0	0.0%	414096
NW	33-Gummi	172	0	0.0%	0	0.0%	50	29.1%	110	64.0%	10	5.8%	2	1.2%	0	0.0%	261681
NW	34-Gusau	419	0	0.0%	1	0.2%	14	3.3%	402	95.9%	1	0.2%	1	0.2%	0	0.0%	489964
NW	35-Kaura Namoda	96	0	0.0%	0	0.0%	0	0.0%	96	100.0%	0	0.0%	0	0.0%	0	0.0%	443351
NW	36-Shinkafi	144	0	0.0%	0	0.0%	25	17.4%	107	74.3%	12	8.3%	0	0.0%	0	0.0%	177384
NW	37-Talata Mafara	75	0	0.0%	0	0.0%	2	2.7%	72	96.0%	1	1.3%	0	0.0%	0	0.0%	311651
NW	38-Tsafe	246	0	0.0%	0	0.0%	1	0.4%	244	99.2%	1	0.4%	0	0.0%	0	0.0%	322575
NW	44-Gada	373	0	0.0%	0	0.0%	60	16.1%	310	83.1%	3	0.8%	0	0.0%	0	0.0%	249168
	TOTAL	8862	17	0.2%	71	0.8%	810	9.1%	7375	83.2%	403	4.5%	143	1.6%	43	0.5%	9732121

NE & NW NIGERIA: 2022 VS PREVIOUS YEAR (2021)

Population affected by cropland changes, per AOI in the NW zone (2021-2022)

Legend: Significant increase, Medium increase, Slight increase, Significant decrease, Medium decrease, Slight decrease

Katsina: 5-Batsari, 6-Dan Musa, 7-Dandume, 8-Faskari, 9-Jibia, 10-Kankara, 11-Kurfi, 12-Sabuwa, 13-Safana

Sokoto: 14-Goronyo, 15-Gudu, 16-Gwadabawa, 17-Illela, 18-Isa, 19-Kebbe, 20-Rabah, 21-Sabon Birni, 22-Tangaza, 23-Tureta, 24-Wurno, 44-Gada

Zamfara: 25-Anka, 26-Bukkuyum, 27-Maradun, 28-Maru, 29-Zurmi, 30-Bakura, 31-Birnin Magaji, 32-Bungudu, 33-Gummi, 34-Gusau, 35-Kaura Namoda, 36-Shinkafi, 37-Talata Mafara, 38-Tsafe

UTILISATION OF 2022 CC ANALYSIS RESULTS IN CH

IMPACT ON AVAILABILITY DIMENSION

Zone	AOI	SD	Total Nb of sites	Pop. 2020	Impacts of long-term positive and negative changes (2022 vs pre-crisis) on the Availability dimension
NE	1-Abadam	Borno North	568	150,056	Strong negative impact
NE	2-Guzamala	Borno North	1,158	122,026	Strong negative impact
NE	3-Marte	Borno North	232	191,622	Strong negative impact
NE	4-Mobbar	Borno North	964	159,652	Strong positive impact
NE	39-Gubio	Borno North	642	228,312	Strong positive impact
NE	40-Kukawa	Borno North	426	316,224	Strong negative impact
NE	41-Magumeri	Borno North	1,637	180,119	Medium positive impact
NE	42-Monguno	Borno North	292	182,512	Strong negative impact
NE	43-Nganzai	Borno North	1,541	144,910	Strong negative impact
NE		*Borno North*	*7,460*	*1,675,433*	Medium negative impact
NW		*Katsina Central**	*2,030*	*1,145,736*	No significant impact
NW		*Katsina South**	*963*	*1,030,244*	Light positive impact
NW		*Sokoto East*	*1,909*	*2,183,406*	Medium negative impact
NW		*Sokoto North**	*359*	*260,230*	No significant impact
NW		*Sokoto South**	*276*	*431,017*	Light negative impact
NW		*Zamfara Central*	*1,556*	*1,632,931*	Light negative impact
NW		*Zamfara North*	*945*	*1,640,576*	Light negative impact
NW		*Zamfara West*	*824*	*1,407,980*	Light negative impact

IMPACT ON HAZARD & VULNERABILITY DIMENSION

Zone	AOI	SD	Total Nb of sites	Pop. 2020	Impacts of short-term negative changes (2022 vs 2021) on the Hazards & Vulnerability dimension
NE	1-Abadam	Borno North	568	150,056	No significant impact
NE	2-Guzamala	Borno North	1,158	122,026	No significant impact
NE	3-Marte	Borno North	232	191,622	No significant impact
NE	4-Mobbar	Borno North	964	159,652	No significant impact
NE	39-Gubio	Borno North	642	228,312	No significant impact
NE	40-Kukawa	Borno North	426	316,224	No significant impact
NE	41-Magumeri	Borno North	1,637	180,119	No significant impact
NE	42-Monguno	Borno North	292	182,512	No significant impact
NE	43-Nganzai	Borno North	1,541	144,910	No significant impact
NE		*Borno North*	*7,460*	*1,675,433*	No significant impact
NW		*Katsina Central**	*2,030*	*1,145,736*	No significant impact
NW		*Katsina South**	*963*	*1,030,244*	No significant impact
NW		*Sokoto East*	*1,909*	*2,183,406*	Light negative impact
NW		*Sokoto North**	*359*	*260,230*	No significant impact
NW		*Sokoto South**	*276*	*431,017*	No significant impact
NW		*Zamfara Central*	*1,556*	*1,632,931*	No significant impact
NW		*Zamfara North*	*945*	*1,640,576*	No significant impact
NW		*Zamfara West*	*824*	*1,407,980*	No significant impact

For the **Availability** component, the overall positive or negative change (pre-crisis versus present) at LGA level is used, determined from the difference between medium-significant increases and decreases ratios, both in terms of localities and populations:

- If one of the absolute positive/negative changes is between 5 and 10%: **slight** positive/negative impact.
- If one of the absolute positive/negative changes is between 10 and 20%: **medium** positive/negative impact.
- If one of the absolute positive/negative changes is greater than 20%: **strong** positive/negative impact.

For the **Hazards & Vulnerability** component, thresholding takes into account only negative changes observed over the past year. For both NE and NW Nigeria, the following thresholds are applied:

- If the negative change is between 5 and 10%: **slight** negative impact.
- If the negative change is between 10 and 20%: **medium** negative impact.
- If the negative change is greater than 20%: **strong negative** impact.

Please refer to tables 1A and 1B in the following pages for proposed contributing factors analysis for the March 2022 CH cycle.

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Conclusion

For northern Borno:

- Severe decrease in cropland since 2010, corresponding to nearly half the population living in those areas

- Only sites sharing border with Yobe show increase between 2010-2022

- Between 2021 – 2022, apparent recovery, but not yet reaching the 2010 cropland availability

For NW states:

- Between 2017 – 2022, decreases observed in Sokoto and Zamfara. Majority of areas (around 70%) show no changes;

- For 2021 – 2022, slight positive changes in Katsina and Zamfara states

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Use and Recommendations

- Cadre Harmonise analysis

- Targeting for livelihood programming, for populations previously unable to conduct normal farming activities

- Targeting for rapid response mechanisms – areas seeing severe agricultural decline

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