Preparing for Genocide: Quasi-Experimental Evidence from Rwanda

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Introduction

How can political elites induce civilians to participate in collective violence?

- We examine if civilian participation in the 1994 Rwandan genocide was affected by earlier participation in a mandatory community work program called **Umuganda**.
- Rwandan genocide saw a high degree of involvement of ordinary citizens in the looting and killings.
- In just 100 days an estimated 800,000 people were killed.
- Umuganda believed to have played an important role in sensitizing and mobilizing the majority Hutu population against the minority Tutsi population (Cook, 2004; Straus, 2006; Thomson, 2009; Verwimp, 2013).

Introduction

- Identifying the causal effect of Umuganda meetings difficult for two reasons:
  - No data on Umuganda participation or number of meetings.
  - Omitted variable bias.
- We exploit exogenous variation in rainfall to proxy for the intensity of participation in Umuganda.
  - Expect meetings to be less enjoyable when it rains and cancelled altogether in case of heavy rainfall.
  - Possible to isolate Umuganda effect from general rainfall effect since Umuganda was always held on Saturdays.
- Given that meetings were mandatory and used to spread anti-Tutsi propaganda, we expect a negative link between Saturday rainfall in the years before 1994 and participation in genocide violence.

Motivation

- Commonly held view: community meetings have a beneficial effect by fostering social capital (e.g Knack & Keefer, 1997; Putnam, 2000).
- This view related to increased focus by development agencies on 'community driven' development projects (Mansuri & Rao, 2012).
- But social arenas may also promote socially undesirable outcomes (Acemoglu et al., 2013; Satyanath, Voightlaender & Voth, 2016).
- Umuganda formally reintroduced in Rwanda in 2008, framed as a vehicle for community building and reconciliation. Similar practice installed in Burundi and being discussed in the DRC and Kenya.

Preview of findings

- One more Saturday with heavy rainfall (one less Umuganda meeting) in 1990-94 led to a significant drop in the share of civilian Hutus participating in the genocide, amounting to around 4 percent.
- This is found controlling for heavy rainfall on all other weekdays in the same period and long-term trends in rainfall.
- Results are found using local variation (commune indicators) and are robust to using standard errors accounting for spatial correlation.
- We let the results undergo several placebo and robustness tests.

Background: Umuganda

- Dates back to pre-colonial times, regarded as a social obligation.
- Used by Belgians to organize compulsory work.
- Re-introduced in 1974 framed as a traditional practice, but more formalized:
  - Mandatory community work on Saturdays taking place at village (cell) level.
  - Centrally planned and supervised by local leaders.
  - Typical tasks: anti-erosion ditches, construction work, building and maintaining roads, etc.
  - Meetings held before/after community work that promoted the ruling party MRND and pro-Hutu ideology.
  - In the early 1990s, the meetings and participation became clearly linked to political messages.

Background: Umuganda

- Combined a practical motivation - achieving development objectives under weak state finances - with a strong ideological element.
- A means for the regime to learn to organize and control population (Cook, 2004; Straus, 2006; Thomson, 2009; Verwimp, 2013).
- During the genocide, the idea of Umuganda was used to motivate people to participate in the killings (Verwimp, 2013; Lawrence & Uwimbabazi, 2013).

Data

- Proxy for genocide participation using prosecution data from Gacaca (local courts), available on sector level.
  - Civilian Violence (participants in killings and acts of violence).
  - Organized Violence (army, militia, police, rapists and torturers).
- Population data from 1991 census.
  - Population size on sector level.
  - Share of Hutus on commune level.
- Daily rainfall data from NOAA (1984-2013), provided on a 0.1 degree longitude-latitude (11km) intervals.
  - Number of rainy Saturdays and all other weekdays
  - Long term rainfall trends

Map civilian violence | Map saturday rainfall | Table summary statistics

Empirical Strategy

$$\frac{Perpetrators_{ic}}{Hutu_{ic}} = \alpha + \beta \, \#Sat(Rainfall > 10mm)_{ic} + X_{ic}\pi + \gamma_c + \epsilon_{ic}$$

Outcome variable

- % Civilian perpetrators (in Hutu population)

Variable of interest

- Number of Saturdays Oct 90 - Mar 94 with rainfall >10 mm

Controls:

- Number of all other weekdays Oct 90 - Mar 94 with rainfall >10 mm
- Avg rainfall in 1980's (Jan 1984 - Sep 1990)
- Avg rainfall in early 1990's (Oct 1990 - Mar 1994)
- Hutu population size
- 142 commune indicators

Choice of rainfall measure

Threshold choice and level

- Is a continuous or discrete relationship more likely?
  - We study mandatory outdoor work $\rightarrow$ likely that there is a "too much-level" beyond which one cannot be outside.
- How much is "heavy" rainfall?
  - 10 mm = 2 std.dev from long-term average of daily rainfall

Related studies

- Absolute threshold: Madestam et al. (2013)
  - Use a threshold of 0.1 inches (2.5 mm) to proxy for lower participation in outdoor events
- Relative measures: Harari and La Ferrara (2012)
  - Use 1 or 2 std. dev from long-term mean to proxy for income shock

Results

Main Results

Dependent Variable:	# Civilian Perpetrators per Hutu		
	(1)	(2)	(3)
# Sat(Rainfall>10mm)	**-0.354**	**-0.341**	**-0.321**
	(0.115)***	(0.105)***	(0.109)***
# Sun(Rainfall>10mm)			0.025
			(0.092)
# Mon(Rainfall>10mm)			0.071
			(0.097)
# Tue(Rainfall>10mm)			0.029
			(0.075)
# Wed(Rainfall>10mm)			0.018
			(0.103)
# Thu(Rainfall>10mm)			-0.051
			(0.112)
# Fri(Rainfall>10mm)			-0.043
			(0.093)
Mean of Dep. variable	7.66	7.66	7.66
Standard Controls	yes	yes	yes
Commune Effects	no	yes	yes
R^2	0.18	0.53	0.53
N	1433	1433	1433

* p<0.10, ** p<0.05, *** p<0.01.

Other thresholds

Main Results

- One more Saturday with rain >10 mm reduced civilian participation rate by **0.32 percentage points**.
- Interpreted for the average civilian participation rate (7.7 percent) this amounts to a **4.2 percent** reduction.
- Because Saturdays with rain >10 mm only varies between 4 and 32, we cannot calculate the counterfactual number of perpetrators if all meetings had been cancelled.
- Using a linear extrapolation not appropriate if there is a non-linear relationship between Umuganda and genocide participation.
- Interpreting the results for the maximum in our sample (32 Saturdays) suggests a reduction by 50 percent.

Robustness and Placebo Tests

Dependent variable:	Mass Grave in Sector		# Civilian Perpetrators, p.H.		Log [# Civilian Perpetrators, p.H.]	
	Alternative Dep. Var.		Without Mass Graves	Additional Controls	Transformed Dep. Var.	
	(1)	(2)	(3)	(4)	(5)	(6)
# Sat(Rainfall>10 mm)	−0.014	−0.012	−0.318	−0.318	−0.040	−0.036
	(0.004)***	(0.004)***	(0.111)***	(0.113)***	(0.013)***	(0.012)***
# Sun(Rainfall>10 mm)		0.002	0.038	−0.001		0.004
		(0.003)	(0.094)	(0.099)		(0.011)
# Mon(Rainfall>10 mm)		−0.002	0.050	0.111		0.008
		(0.004)	(0.095)	(0.097)		(0.013)
# Tue(Rainfall>10 mm)		0.007	0.068	0.024		−0.007
		(0.004)*	(0.079)	(0.076)		(0.012)
# Wed(Rainfall>10 mm)		0.006	0.014	0.009		0.002
		(0.004)	(0.100)	(0.098)		(0.013)
# Thu(Rainfall>10 mm)		−0.003	−0.049	−0.033		−0.030
		(0.004)	(0.108)	(0.113)		(0.018)
# Fri(Rainfall>10 mm)		−0.008	−0.008	−0.009		−0.009
		(0.003)**	(0.091)	(0.093)		(0.011)
Standard Controls	yes	yes	yes	yes	yes	yes
Additional Controls	no	no	no	yes	no	no
Commune Effects	yes	yes	yes	yes	yes	yes
R^2	0.15	0.16	0.53	0.53	0.71	0.71
N	1432	1432	1367	1433	1433	1433

Exclusion Restriction

Dependent variable:	# Civilian Perpetrators, p.H.									
	Without Kigali	Without Major Cities	Public Holidays		Excl. Pre-Violence	Genocide Rainfall	Local Pro-Hutu Leaders		Local Opposition Leaders	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
# Sat(Rainfall> 10 mm)	−0.341	−0.347	−0.319	−0.308	−0.416	−0.284	−0.407	−0.388	0.717	0.415
	(0.110)***	(0.113)***	(0.106)***	(0.105)***	(0.123)***	(0.110)**	(0.096)***	(0.101)***	(0.900)	(0.798)
# Sun(Rainfall> 10 mm)	0.026	0.046	0.028	0.031	0.035	0.010		0.015		0.389
	(0.095)	(0.099)	(0.093)	(0.094)	(0.108)	(0.091)		(0.089)		(0.795)
# Mon(Rainfall> 10 mm)	0.065	0.049	0.073	0.064	0.113	0.020		0.028		0.041
	(0.097)	(0.099)	(0.095)	(0.097)	(0.113)	(0.096)		(0.093)		(0.366)
# Tue(Rainfall> 10 mm)	0.021	0.035	0.034	0.037	−0.011	0.018		0.029		−0.008
	(0.077)	(0.076)	(0.084)	(0.082)	(0.085)	(0.069)		(0.073)		(0.413)
# Wed(Rainfall> 10 mm)	−0.003	0.007	0.017	0.017	−0.018	0.037		−0.023		0.709
	(0.108)	(0.115)	(0.105)	(0.102)	(0.107)	(0.105)		(0.103)		(0.400)*
# Thu(Rainfall> 10 mm)	−0.038	−0.040	−0.050	−0.049	0.082	0.017		−0.116		0.845
	(0.115)	(0.119)	(0.112)	(0.113)	(0.126)	(0.119)		(0.107)		(0.615)
# Fri(Rainfall> 10 mm)	−0.048	−0.033	−0.039	0.004	0.034	−0.046		0.005		−0.185
	(0.093)	(0.098)	(0.106)	(0.119)	(0.108)	(0.095)		(0.089)		(0.419)
# Pub. Holidays(Rainfall>10 mm)			−0.082							
			(0.433)							
# Non-Rel. Holidays(Rainfall>10 mm)				−0.214						
				(0.341)						
# Rel. Holidays(Rainfall>10 mm)				−0.576						
				(0.409)						
Standard Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Genocide Controls	no	no	no	no	no	yes	no	no	no	no
Commune Effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R^2	0.53	0.53	0.53	0.53	0.50	0.53	0.56	0.56	0.33	0.35
N	1422	1358	1433	1433	1213	1433	1266	1266	161	161

Summary of findings

- We find that more rain on Saturdays in the pre-genocide period (more cancelled meetings) led to significantly less civilian participation in the genocide.
- These results are
  - found controlling for rain on all other weekdays, commune FE, and long-term rainfall trends.
  - robust to using standard errors accounting for spatial correlation.
- No similar robust effect for Sundays (church-going day) or public holidays, and the negative effect is entirely driven by areas with elected officials from pro-Hutu parties.
- This indicates that the political element of Umuganda mattered, and that this is something beyond an effect of getting together.

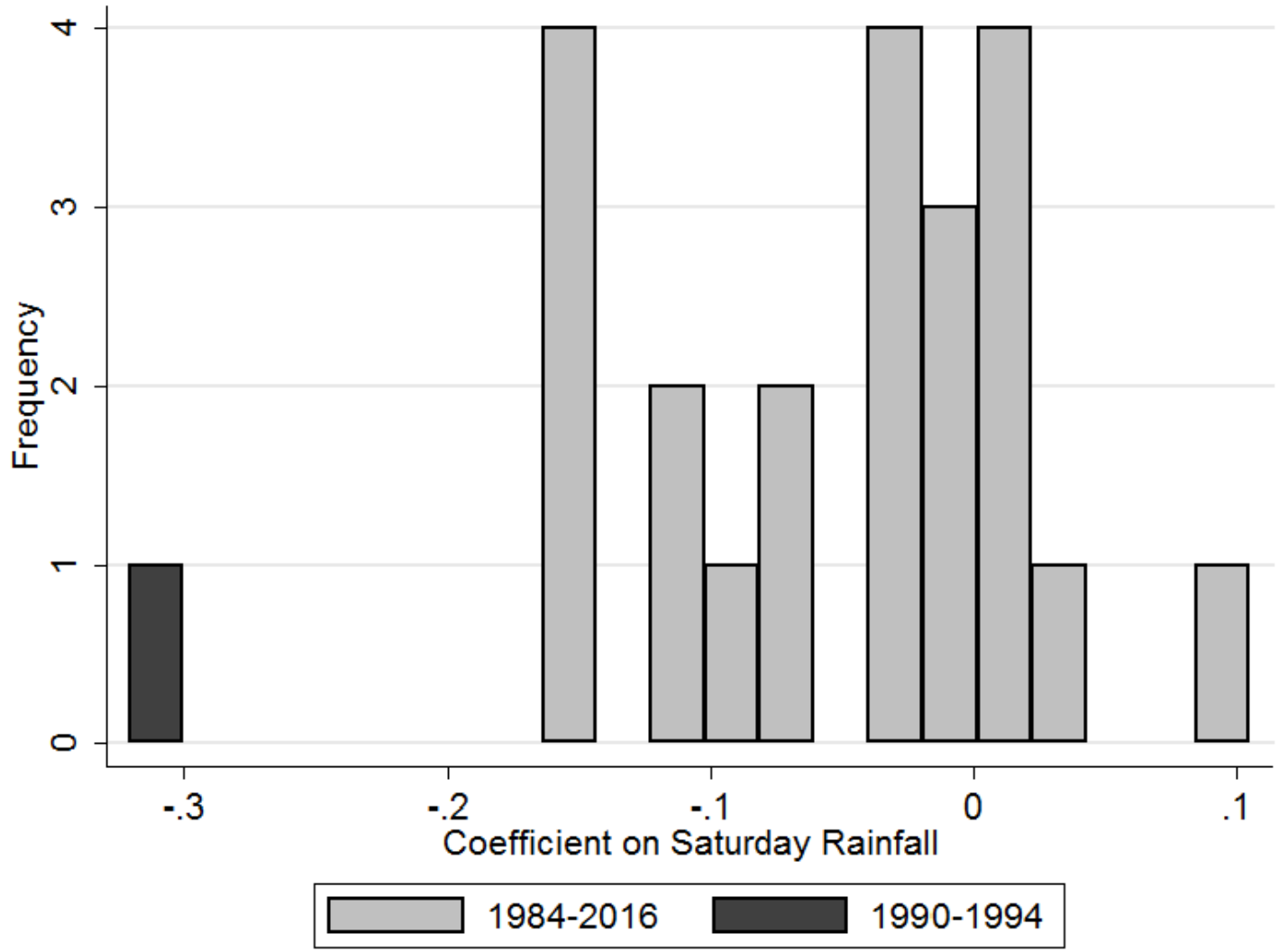
Conley Other periods

Conclusion

- Common understanding that the genocide was centrally planned, but less is known about the link between the planning and the wide acceptance of the genocide among civilians.
- Our results suggest that Umuganda played an important role in this preparation and mobilization.
- We show evidence of a darker side to this type of institution compared to the literature on social capital.
- Caution seems appropriate, especially in fragile states with a history of civil conflict.

Thank you!

Robustness: Other Time Periods



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Sensitivity of Point Estimate to Changes in Threshold

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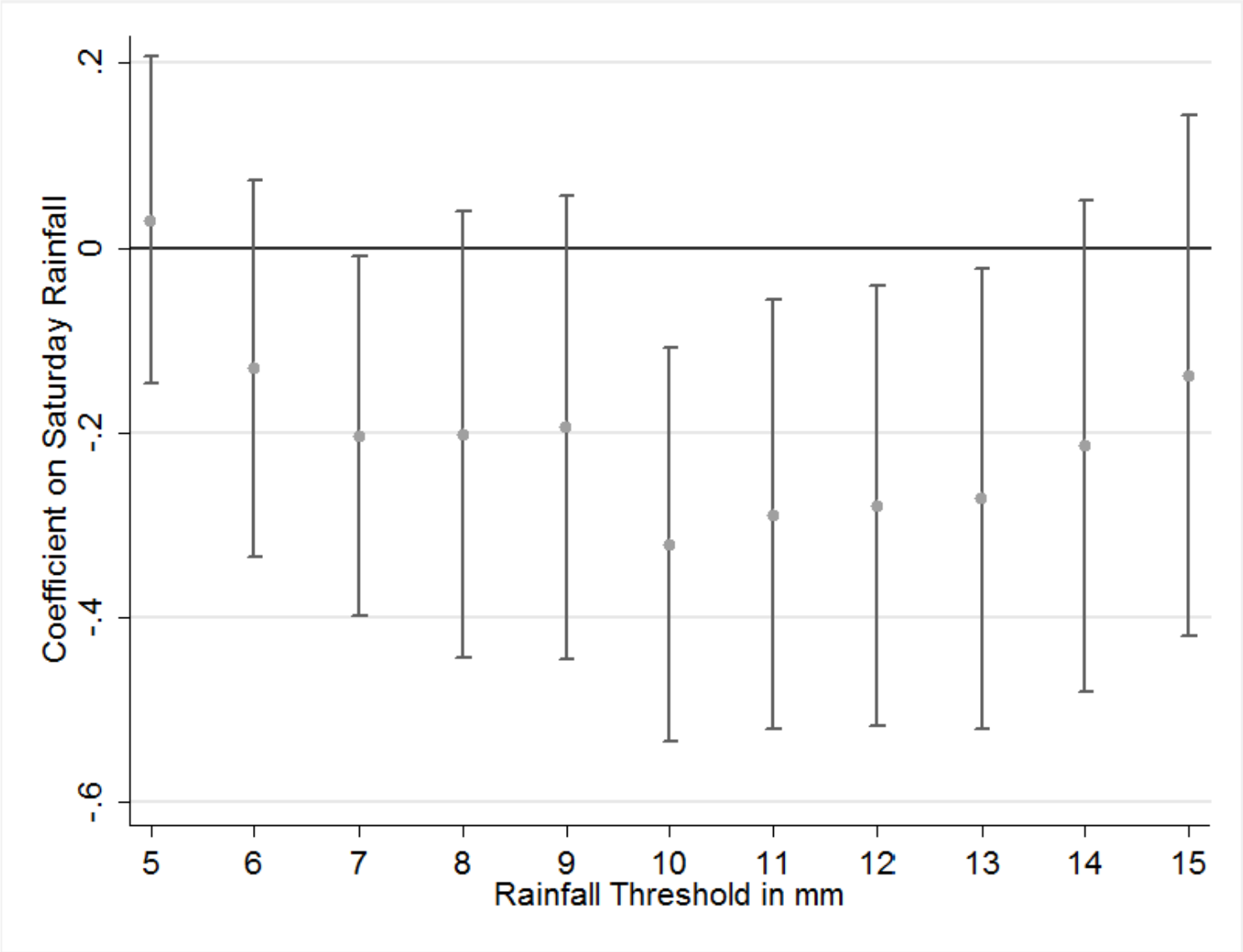
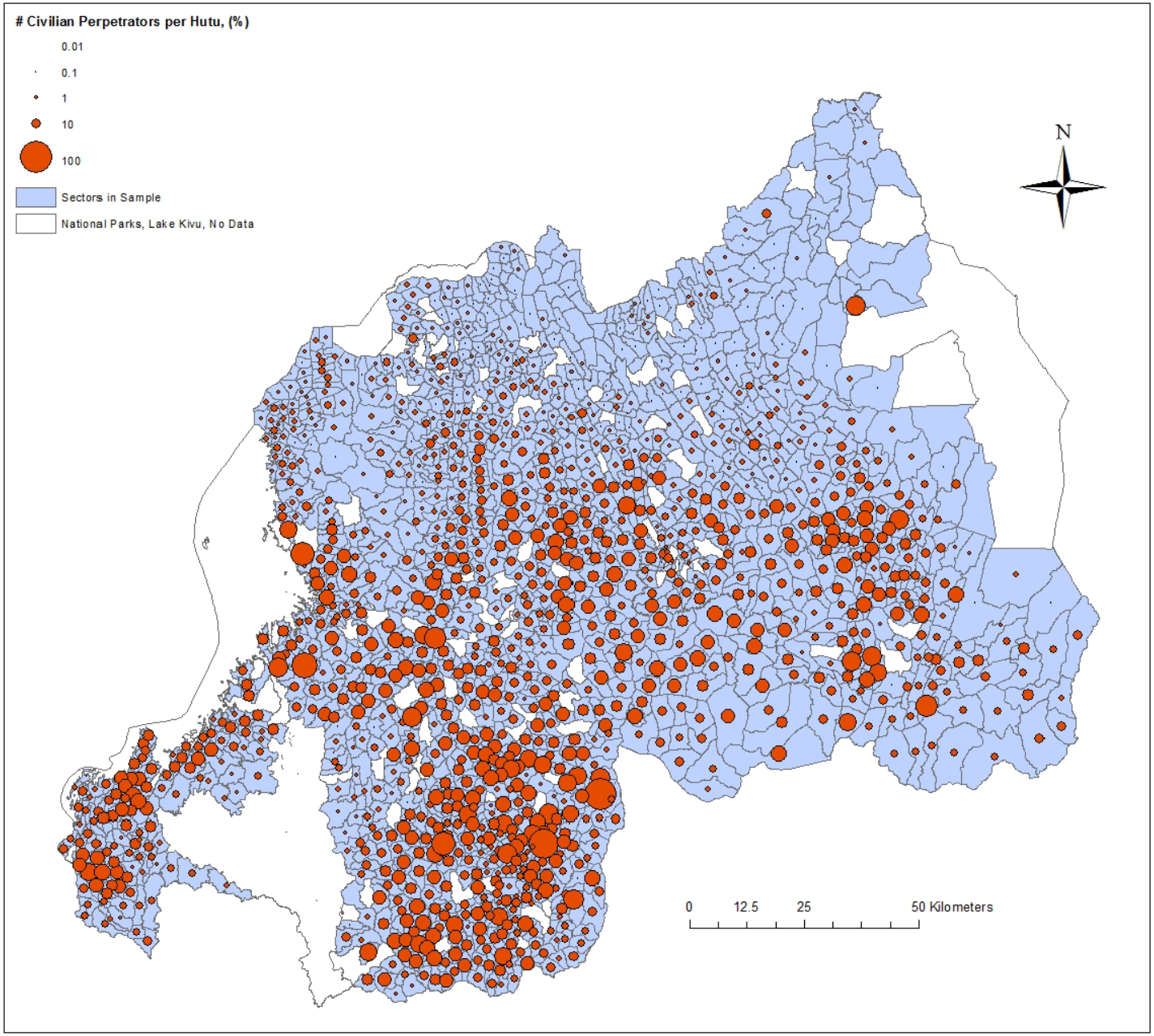
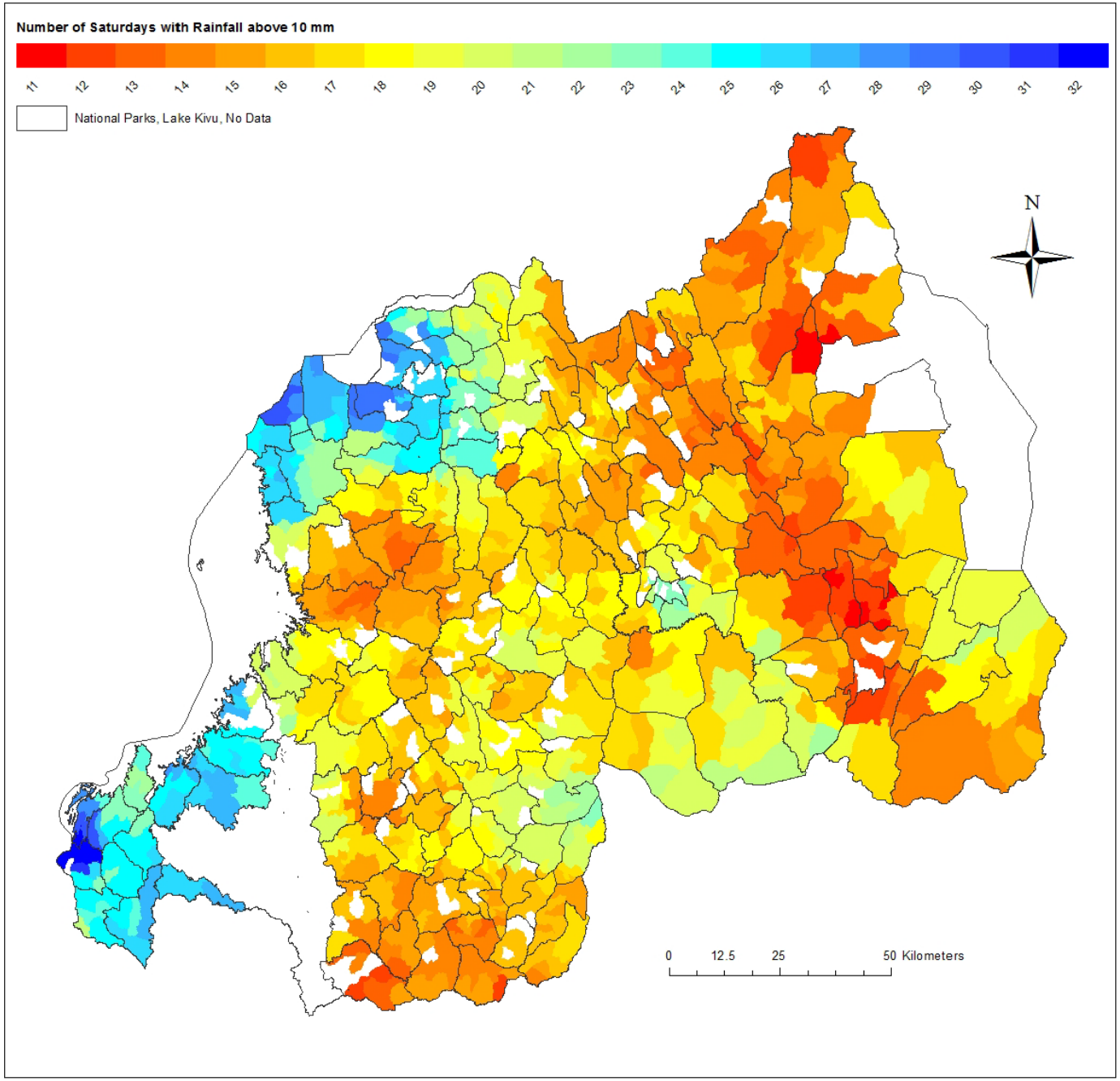



Civilian Perpetrators per Hutu, (%)
0.01
0.1
1
10
100
Sectors in Sample
National Parks, Lake Kivu, No Data
N
0
12.5
25
50 Kilometers


Number of Saturdays with Rainfall above 10 mm
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
National Parks, Lake Kivu, No Data
N
0
12.5
25
50 Kilometers

Summary Statistics

	Mean	Std. Dev	Obs.
A. Violence & Population			
# Civilian Perpetrators	290.25	286.43	1433
#Organized Perpetrators	51.76	70.51	1433
% Civilian Perpetrators (in hutu population)	7.66	7.93	1433
% Organized Perpetrators (in hutu population)	1.40	2.09	1433
Pre-Genocide Violence against Tutsi, dummy	0.15	0.36	142
Mass Grave found in Sector, dummy	0.05	0.21	1432
Population in Sector, '000	4.88	2.48	1433
Hutu Population in Sector, '000	4.26	2.17	1433
Population Density	0.50	0.85	1433
B. Rainfall			
# Sat(Rain>10mm)	18.25	4.24	1433
# Sun(Rain>10mm)	15.14	5.19	1433
# Mon(Rain>10mm)	15.13	4.22	1433
# Tue(Rain>10mm)	18.10	3.52	1433
# Wed(Rain>10mm)	20.51	4.76	1433
# Thu(Rain>10mm)	21.53	3.97	1433
# Fri(Rain>10mm)	17.02	4.75	1433
Average Daily Rainfall, 1980s	2.58	0.48	1433
Average Daily Rainfall, 1990s	2.44	0.55	1433
# Non-Rel. Holidays(Rain>10mm)	1.56	0.21	1433
# Rel. Holidays(Rain>10mm)	1.00	0.11	1433
C. Other Variables			
Fraction in hutu population with Radio	0.33	0.09	142
Tutsi Minority Share	0.10	0.13	142
Num of Sectors in Commune	11	3.7	142

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Additional Standard Errors

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Dependent Variable:	# Civilian Perpetrators, p.H.			
	25 km	50 km	75 km	District
	(1)	(2)	(3)	(4)
# Sat(Rainfall>10 mm)	−0.316	−0.316	−0.316	−0.321
	[0.128]**	[0.132]**	[0.130]**	[0.108]***
# Sun(Rainfall>10 mm)	0.034	0.034	0.034	0.025
	[0.094]	[0.087]	[0.080]	[0.095]
# Mon(Rainfall>10 mm)	0.116	0.116	0.116	0.071
	[0.094]	[0.104]	[0.105]	[0.102]
# Tue(Rainfall>10 mm)	0.047	0.047	0.047	0.029
	[0.100]	[0.113]	[0.105]	[0.112]
# Wed(Rainfall>10 mm)	0.095	0.095	0.095	0.018
	[0.106]	[0.092]	[0.092]	[0.086]
# Thu(Rainfall>10 mm)	−0.019	−0.019	−0.019	−0.051
	[0.120]	[0.131]	[0.144]	[0.121]
# Fri(Rainfall>10 mm)	−0.059	−0.059	−0.059	−0.043
	[0.110]	[0.105]	[0.088]	[0.097]
Standard Controls	yes	yes	yes	yes
Commune Effects	yes	yes	yes	yes
R^2	0.49	0.49	0.49	0.53
N	1433	1433	1433	1433