Land, institutional settings and communal conflicts

Sara Balestri [1] Raul Caruso [2]

[1]Department of Economics
University of Perugia

[2]Department of Economic Policy - Università Cattolica del Sacro Cuore
CESPIC - Catholic University 'Our Lady of Good Counsel'

24-26 October 2024
65th Annual SIE Conference

Overview

- We explore the relationship between different aspects of **institutional quality** and **communal violence**.

- **Communal violence** refers to all non-state civil conflicts deadly events between communal groups.

  Communal groups are not permanently organized for combat, and organize themselves along **shared common identity lines (such as ethnic or tribal ties)** to engage in fighting [Sundberg, Eck, and Kreutz 2012].

Overview: communal violence

- **Communal violence** is likely to rise as a result of **inter-group increased competition over livelihoods means, resources**, especially in case of socioeconomic marginalization of specific groups [Hillesund 2019].
- The empirical literature about communal conflicts discusses different drivers:
  - → environmental scarcity [Barnett and Adger 2007; Raleigh and Kniveton 2010; Döring 2020],
  - → climate uncertainty and climate change effects [Fjelde and Uexkull 2012; Raleigh and Kniveton 2012; Nordkvelle, Rustad, and Salmivalli 2017; Weezel 2019],
  - → country vulnerability to climate change [Balestri and Caruso 2024]
  - → patronage systems [Berenschot 2011],
  - → customary bodies and legal authorities [Eck 2014; Wig and Kromrey 2018; De Juan, Pierskalla, and Vüllers 2015].

Theoretical framework

Aim

This research aims at exploring the effect of **land-related institutional settings** on the **likelihood and severity of communal violence** in Sub-Saharan Africa (SSA) and test such relations in case of climate shocks.

Land rights are critically important for **communal groups** for several reasons, encompassing economic stability [Deininger and Feder 2001], social cohesion [Larson 2010], cultural preservation [Wily 2010], environmental sustainability [Ostrom 1990], and political empowerment [Meinzen-Dick and Mwangi 2009].

Defining land-related institutional settings

The identification of cross-country standardized criteria for land institutional settings **is challenging** due to a variety of factors, including historical legacies, cultural differences, varying legal frameworks (e.g., common law, civil law, customary law, religious law) that shape land tenure systems.

- To overcome this difficulty in an initial research phase, we consider the **quality of some institutional aspects that the empirical literature links to the definition of land rights** (= land-related institutional settings)

Institutional metrics connected with land institutional settings (V-Dem)

- **Transparent laws with predictable enforcement**: clarity of land rights, public access to information (reducing opportunities for corruption), legal framework clearly outlining the processes for acquiring, transferring, and inheriting land rights, uniform application of legal provisions across different cases (preventing arbitrary decisions and ensuring fairness) [Deininger, Selod, and Burns 2012].
- **Power distribution by social groups**: Land tenure systems tend to reflect the distribution of power, especially in case of patronage systems [Boone 2014], with control over land often equating to control over economic resources and political influence [Moyo 2011].
- **Property rights**: when property rights are respected, landowners are more likely to make long-term investments in their land, engage in sustainable land use practices, leading to improved agricultural productivity and economic growth [Deininger and Feder 2001], although there is an increasing risk of land commodification [De Schutter 2015].

Research Questions

The quality of the institutional framework within which land laws are defined can influence their adoption and compliance, affecting local dynamics.

RQ1: Do more transparent and predictably enforceable laws reduce communal violence?

RQ2: How do more inclusive institutional settings affect communal violence?

RQ3: How does a higher definition of property rights - being expected to reduce the precariousness of livelihoods - relate to communal groups mobilization?

Research Design

- Longitudinal panel data covering Sub-Saharan African countries, using **country/year observation as unit of analysis** (Obs=1352).
- Period of observation:**1990-2021** (32 years)
- Dependent Variable: **events of communal violence**, coded as dichotomous variable and count variable
- Estimation technique: **panel probit** for binary outcomes and **panel negative binomial** for count data, both with robust errors clustered at country level

$$\Pr[confl_{i,t} = 1 \mid X_{i,t}] = \alpha + \beta_1 inst.sett_{i,t-1} + \beta_2 landuse_{i,t-1} + \beta_3 X_{i,t-1} + \epsilon_{i,t}$$

$$Severity(confl)_{i,t} = \alpha + \beta_1 inst.sett_{i,t-1} + \beta_2 landuse_{i,t-1} + \beta_3 X_{i,t-1} + \epsilon_{i,t}$$

All variables are measured at **time (t-1)** to avoid reverse causality.

Dependent variable:

- armed events of communal conflicts (UCDP-GED)

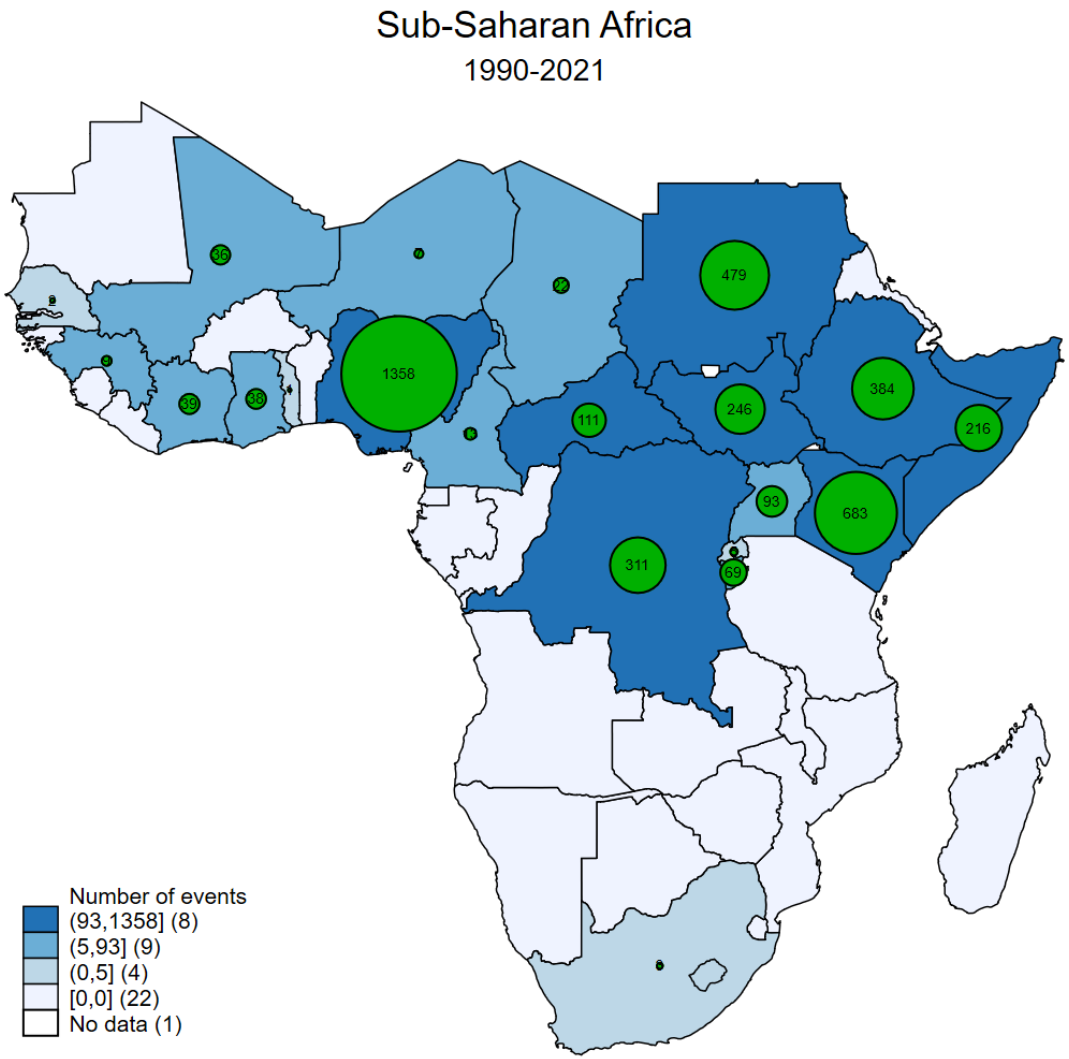
Main explanatory variables:

- land-related institutional settings (V-Dem, v.14):
  - transparent laws with predictable enforcement
  - power distributed by social groups
  - property rights, including land

Control variables:

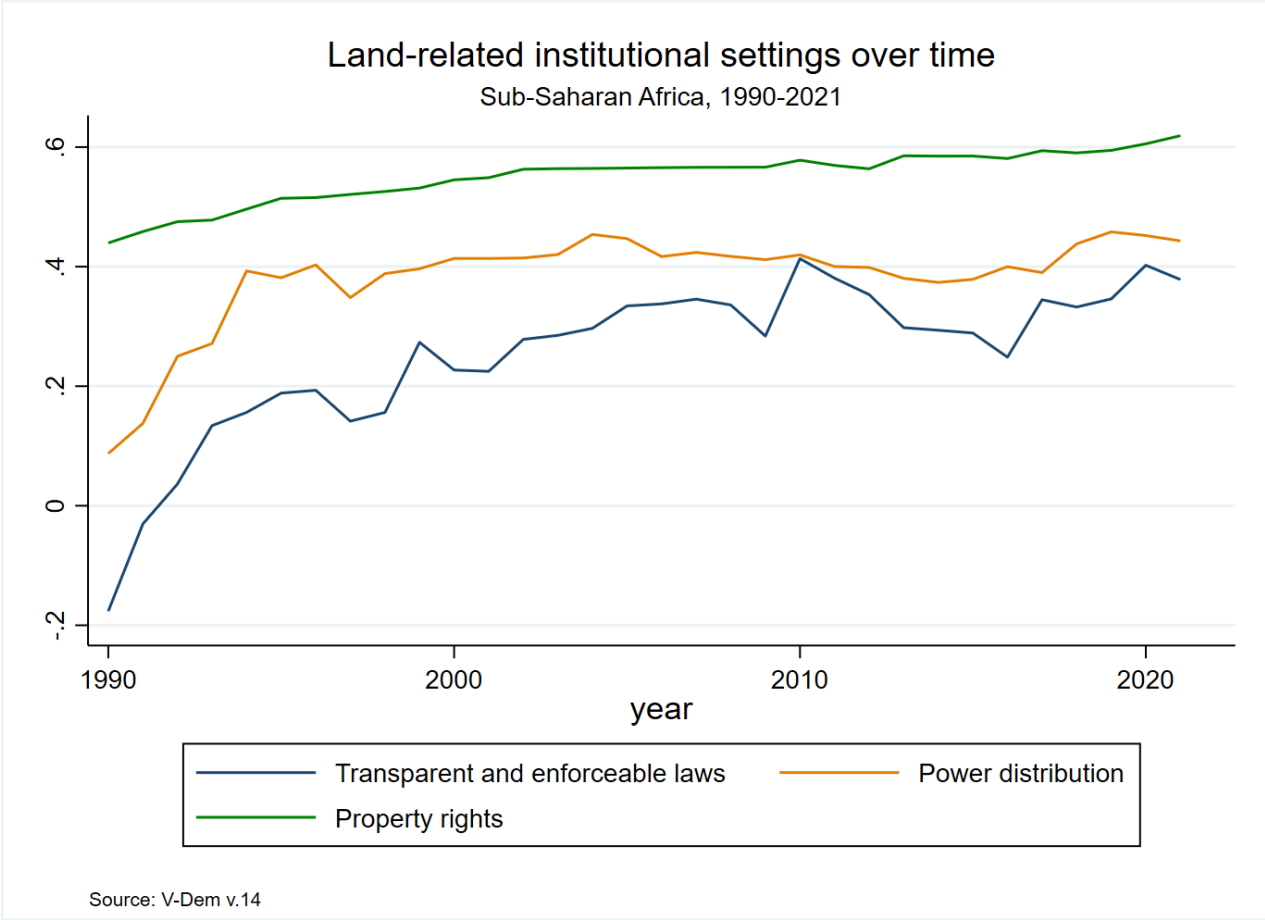
- land use: pasture land and forest (FAO-STAT)
- size of discriminated population (ETH-EPR)
- GDPpc (WDI - World Bank)
- rural population (WDI - World Bank)
- predominantly rural (share of rural population $>=$75%) (WDI - World Bank)
- prior experience of communal violence (UCDP-GED)
- climate shock: drought and flood frequency (EM-DAT)

Events of communal violence



- 4125 events of communal violence reported in 21 countries

Land-related institutional settings over time

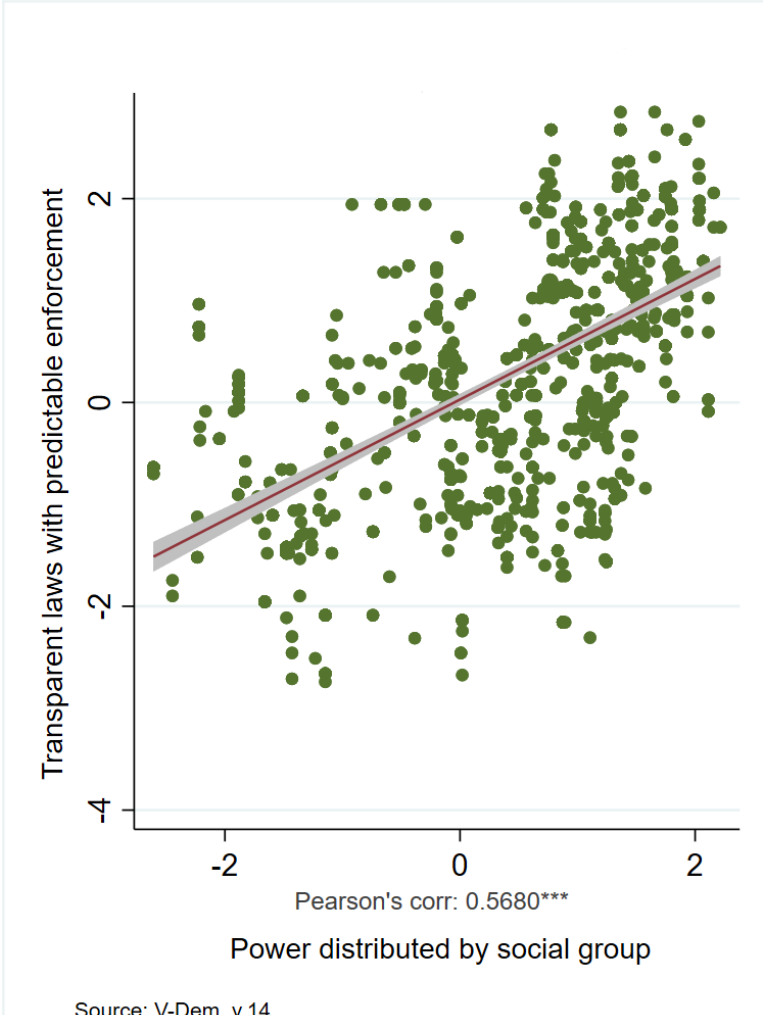


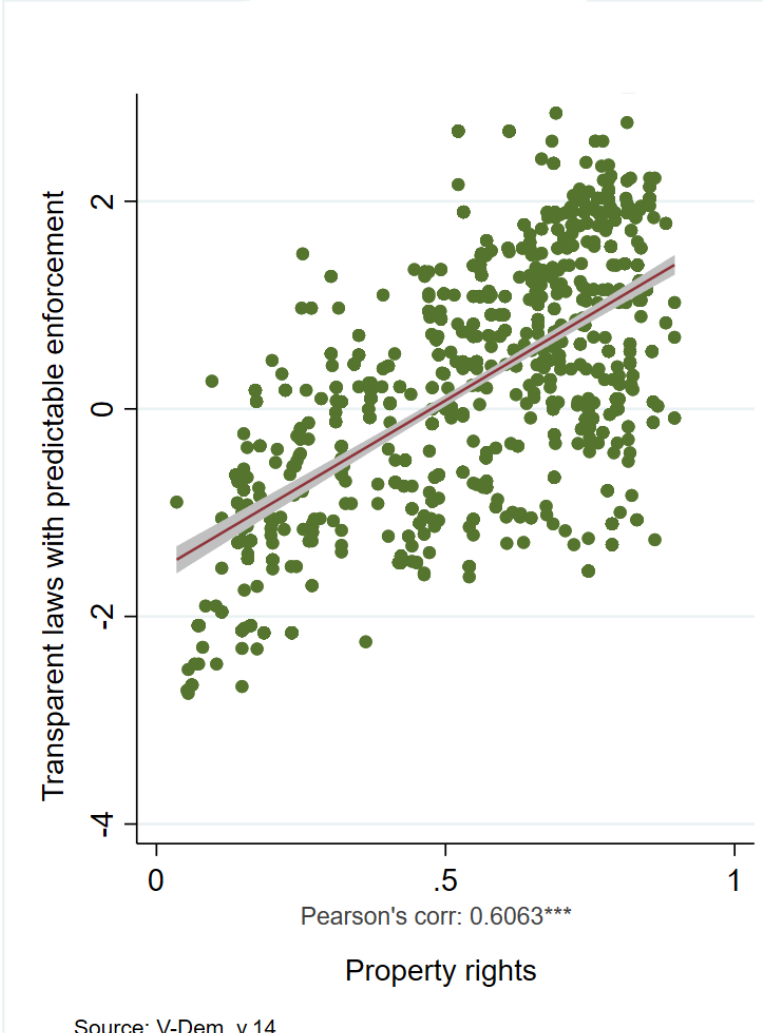
Overall variation, by indicator:

- Transparent and enforceable laws = 0.554
- Power distribution = 0.355
- Property rights = 0.179

Correlation between measures of institutional settings

Law transparency and enforceability shows high correlation with respect to what extent power is distributed within a society (=**inclusiveness**) and to what extent (private) property rights are recognized and respected (=**rule of law**).





Likelihood of communal violence in Sub-Saharan Africa

Table 1: Likelihood of events of communal violence (1990-2021)

	(1.1)	(1.2)	(2.1)	(2.2)	(3.1)	(3.2)
Transparent laws	**-0.3972*** **	**-0.310*** **				
	(0.130)	(0.090)				
Power distrib. by social group			-0.150	-0.117		
			(0.101)	(0.095)		
Property Rights					-0.407	-0.644
					(0.648)	(0.546)
Pasture land (%)	0.608		1.051		0.907	
	(1.072)		(1.199)		(1.232)	
Forest land (%)		-2.168**		-1.868*		-2.038**
		(0.905)		(1.010)		(0.994)
Share discriminated population	1.336**	1.258**	1.424**	1.455***	1.478**	1.389**
	(0.577)	(0.517)	(0.580)	(0.531)	(0.610)	(0.548)
(ln) GDPpc	-0.076	-0.022	-0.179	-0.112	-0.115	-0.044
	(0.193)	(0.175)	(0.188)	(0.184)	(0.221)	(0.195)
(ln) Rural population	0.915***	0.865***	0.917***	0.848***	0.903***	0.847***
	(0.206)	(0.196)	(0.218)	(0.202)	(0.215)	(0.200)
Predominantly rural	-0.225	-0.249	-0.193	-0.193	-0.173	-0.196
	(0.271)	(0.260)	(0.259)	(0.264)	(0.262)	(0.269)
Past communal violence	1.203***	1.221***	1.188***	1.214***	1.195***	1.223***
	(0.221)	(0.213)	(0.219)	(0.214)	(0.220)	(0.216)
Obs	1304	1304	1304	1304	1304	1304
AIC	542.803	535.831	547.665	544.252	548.711	543.887
BIC	589.362	582.390	594.223	590.810	595.270	590.445

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Panel probit regression coefficients with standard errors clustered at country level in parentheses. All variables are temporally lagged one year.

Severity of communal violence in Sub-Saharan Africa

Table 2: Number of events of communal violence (1990-2021)

	(1.3)	(1.4)	(2.3)	(2.4)	(3.3)	(3.4)
Transparent laws	0.052	-0.045				
	(0.078)	(0.080)				
Power distrib. by social group			-0.065	-0.055		
			(0.077)	(0.080)		
Power Rights					0.195	-0.392
					(0.414)	(0.402)
Pasture land (%)	3.374***		3.147***		3.412***	
	(0.778)		(0.790)		(0.803)	
Forest land (%)		-1.739***		-1.504**		-1.715***
		(0.587)		(0.622)		(0.573)
Share discriminated population	0.914*	1.175**	0.973*	1.241**	0.916*	1.177**
	(0.505)	(0.508)	(0.508)	(0.510)	(0.508)	(0.502)
(ln) GDPpc	-0.055	0.137	-0.024	0.158	-0.085	0.188
	(0.140)	(0.133)	(0.143)	(0.136)	(0.159)	(0.141)
(ln) Rural population	0.867***	0.788***	0.905***	0.789***	0.844***	0.849***
	(0.155)	(0.145)	(0.156)	(0.145)	(0.171)	(0.164)
Predominantly rural	0.127	0.163	-0.015	0.143	0.146	0.057
	(0.306)	(0.306)	(0.307)	(0.309)	(0.340)	(0.334)
Past communal violence	0.009***	0.009***	0.010***	0.009***	0.010***	0.009***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Obs	1304	1304	1304	1304	1304	1304
AIC	2227.390	2237.158	2227.119	2237.009	2227.619	2236.525
BIC	2279.122	2288.890	2278.851	2288.741	2279.351	2288.257

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Panel negative binomial regression coefficients with standard errors clustered at country level in parentheses. All variables are temporally lagged one year.

Climate shock: impact on communal violence likelihood

Table 3: Likelihood of events of communal violence (1990-2021)

	(4.1)	(4.2)	(4.3)	(4.4)
Transparent laws	**-0.328*** **	**-0.363*** **	**-0.211***	**-0.239****
	(0.111)	(0.100)	(0.118)	(0.053)
$\text{Drought}_{(t)}$	-0.033	-0.062		
	(0.158)	(0.158)		
$\text{Drought}_{(t)}$×Transparent laws	**0.326*** **	**0.322*** **		
	(0.110)	(0.109)		
$\text{Flood}_{(t)}$			0.036	0.028
			(0.053)	(0.053)
$\text{Flood}_{(t)}$×Transparent laws			**-0.100***	**-0.103***
			(0.057)	(0.055)
Other controls	Yes	Yes	Yes	Yes
Obs	1304	1304	1304	1304
AIC	542.225	535.363	544.418	537.339
BIC	599.130	592.268	601.323	594.244

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Panel probit regression coefficients with standard errors clustered at country level in parentheses. Unless specified, all variables are temporally lagged one year. Mod.(4.1) and (4.3) include pasture land; Mod.(4.2) and (4.4) forest land.

Results are robust to the inclusion of institutional settings variations with respect to the beginning of the period.

Climate shock: impact on communal violence severity

Table 4: Number of events of communal violence (1990-2021)

	(5.1)	(5.2)	(5.3)	(5.4)
Transparent laws	0.011	-0.080	0.018	-0.071
	(0.080)	(0.082)	(0.093)	(0.095)
$\text{Drought}_{(t)}$	0.082	0.042		
	(0.142)	(0.148)		
$\text{Drought}_{(t)}$ × Transparent laws	**0.275****	**0.274***		
	(0.134)	(0.163)		
$\text{Flood}_{(t)}$			**0.087****	**0.086****
			(0.042)	(0.042)
$\text{Flood}_{(t)}$ × Transparent laws			0.012	0.006
			(0.055)	(0.057)
Other controls	Yes	Yes	Yes	Yes
Obs	1304	1304	1304	1304
AIC	2226.146	2237.427	2227.566	2237.449
BIC	2288.224	2299.505	2289.644	2299.527

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Panel probit regression coefficients with standard errors clustered at country level in parentheses. Unless specified, all variables are temporally lagged one year. Mod.(5.1) and (5.3) include pasture land; Mod.(5.2) and (5.4) forest land. Results are robust to the inclusion of institutional settings variations with respect to the beginning of the period.

Additional estimations and robustness checks

We performed some **additional estimations** by including controls for: likelihood SSA severity SSA

- inflation (short-term economic dynamics)
- religious nature of communal violence
- electoral violence
- inclusion of institutional settings variations with respect to the beginning of the period.

Finally, we run some **robustness checks** by:

- controlling for time-fixed effects likelihood severity
- controlling for GDPpc non-linear effects likelihood severity

Main findings are confirmed in coefficient sign and significance.

Limitations

- This study has potential limitations due to **possible endogeneity issues**, however:
  - **reversed models** do not signal any significant relation, also including broader temporal lags
  - chosen **scale of analysis** supports disentangling the direction of effect: while institutional settings shape the political environment in which social instability may erupt, it is less likely that low-intensity locally concentrated events can shape national institutional settings.
- Limited sample size does not allow to **control unobserved heterogeneity** through fixed effects, however:
  - alternatively controlling for those countries experiencing largest variations in institutional settings does not modify the results.

Preliminary conclusions

- **The formal definition of laws** – regardless to what extent inclusiveness applies – **overcomes the substantial definition of power among social groups** in explaining communal violence likelihood in SSA.
- **Land use matters** to explain the severity of communal violence in SSA most likely by providing livelihood means (expansion of forests) or creating competing incentives to use common pool resources (=expansion of pastures)

Preliminary conclusions (cont.)

- Results suggest that **induced scarcity** and **environmental distress** due to climate shock tend to generate different effects depending on the nature and time horizon of the events - given the institutional framework:
  - **slow-onset disasters** (drought) erode livelihoods and resilience over time. They tend to narrow the stabilizing effect of improved institutional settings, possibly contributing to communal violence. Possible transmission channels:
    - resource redistribution issues
    - raising expectations that institutions may struggle to meet
    - failing to address the root causes of inequality and resource scarcity
  - **rapid-onset disasters** (flood) develop suddenly, require immediate emergency response and are less tied to long-term conflict over resources. Higher institutional quality may facilitate coordination issues and public trust, reducing grievances.

Further research

We are working on two main dimensions:

- identification of a **closer measure of institutional land settings**, even if the high variability of cases and jurisdictions may be a limitation to this effort.
  - existence of competitive or single jurisdictions
  - recognition of communal land and collective rights, defined according to customary law
- inclusion of a measure of **geographical concentration of violence**

Thank you!

sara.balestri@unipg.it
raul.caruso@unicatt.it

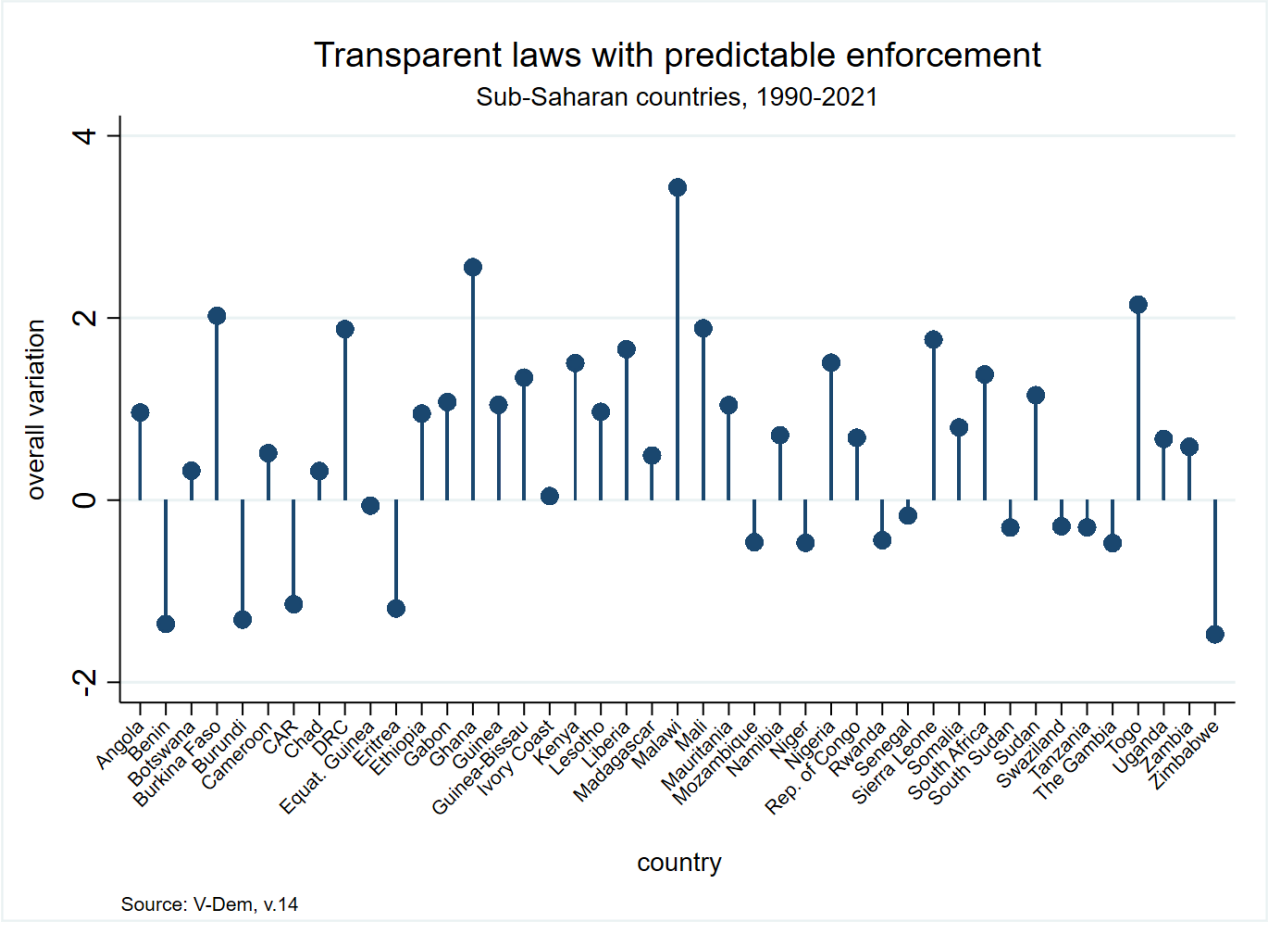
Variables description

Sub-Saharan Africa

Variable	Obs	Mean	St.Dev.	Min	Max	Source
incidence of communal violence	1352	.193787	.3954102	0	1	UCDP-GED
number of events communal violence	1352	3.051036	12.58003	0	235	UCDP-GED
transparent laws	1352	.2545629	1.220286	-2.741	2.85	V-Dem, v.14
power distrib. by social groups	1352	.3826923	1.170299	-2.608	2.215	V-Dem, v.14
property rights	1352	.5512345	.2239655	.035	0896	V-Dem, v.14
pasture share	1352	.3077768	.1845529	.001016	.691853	FAOSTAT
forest share	1352	.3264828	.2492347	.0029821	.9622639	FAOSTAT
share discriminated population	1352	.0325984	.1017435	0	.86	ETH-EPR
(ln) GDPpc	1304	6.923322	.8689408	5.248865	9.562584	WDI
(ln) rural population	1352	15.54461	1.348642	12.32036	18.42905	WDI
predominantly rural	1352	.25	.4331729	0	1	WDI
drought	1352	.142751	.349948	0	1	EM-DAT
flood	1352	.673816	.965409	0	7	EM-DAT
religious	1352	.0214497	.1449315	0	1	UCDP-GED
transboundary	1352	.0613905	.2401341	0	1	UCDP-GED
inflation	1174	49.66156	725.5691	-16.85969	23773.13	WDI
electoral violence	1352	.1213018	.3265985	0	1	DECO

Institutional quality across African countries

We found very different country-experiences during the observation period.



Additional estimations: likelihood in SSA

back

Table 5: Likelihood of communal violence in SSA (1990-2021)

	Mod. (1.5)			Mod. (1.6)		
	(1)	(2)	(3)	(4)	(5)	(6)
Transparent laws	-0.348***	-0.319***	-0.334***	-0.383***	-0.355***	-0.368***
	(0.118)	(0.110)	(0.109)	(0.108)	(0.098)	(0.098)
Drought$_{(t)}$	-0.039	-0.028	-0.020	-0.068	-0.056	-0.050
	(0.153)	(0.156)	(0.158)	(0.154)	(0.156)	(0.158)
Drought$_{(t)}$×Transparent laws	0.307***	0.320***	0.330***	0.304***	0.313***	0.326***
	(0.114)	(0.109)	(0.107)	(0.112)	(0.107)	(0.105)
Inflation	0.015			0.020**		
	(0.011)			(0.010)		
Religious		0.569			0.598	
		(0.413)			(0.388)	
Electoral violence			0.241**			0.248**
			(0.116)			(0.119)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Obs	1168	1304	1304	1168	1304	1304
AIC	506.872	542.882	542.516	500.660	535.853	535.541
BIC	567.628	604.961	604.595	561.416	597.931	597.620

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Standard errors clustered at country level in parentheses. Unless specified, all variables are temporally lagged one year.

Results are robust to the inclusion of institutional settings variations with respect to the beginning of the period.

Additional estimations: severity in SSA

back

Table 6: Number of events of communal violence in SSA (1990-2021)

	Mod. (1.7)			Mod. (1.8)		
	(1)	(2)	(3)	(4)	(5)	(6)
Transparent laws	-0.005	0.009	0.003	-0.080	-0.082	-0.090
	(0.082)	(0.081)	(0.081)	(0.084)	(0.082)	(0.083)
$\text{Drought}_{(t)}$	0.087	0.104	0.124	0.017	0.045	0.069
	(0.153)	(0.150)	(0.148)	(0.158)	(0.154)	(0.153)
$\text{Drought}_{(t)}$×Transparent laws	**0.310****	**0.330****	**0.360****	**0.310***	**0.306***	**0.336****
	(0.158)	(0.154)	(0.152)	(0.168)	(0.163)	(0.160)
Inflation	0.006			0.005		
	(0.004)			(0.004)		
Religious		-0.062			-0.102	
		(0.233)			(0.230)	
Electoral violence			0.254**			0.289**
			(0.127)			(0.130)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Obs	1168	1304	1304	1168	1304	1304
AIC	2102.231	2228.075	2224.301	2111.898	2239.230	2234.677
BIC	2168.050	2295.327	2291.552	2177.717	2306.481	2301.929

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Standard errors clustered at country level in parentheses. Unless specified, all variables are temporally lagged one year.

Results are robust to the inclusion of institutional settings variations with respect to the beginning of the period.

Robustness checks : time fixed effects back

Table 7: Likelihood of communal violence (1990-2021)

	(4.5)	(4.6)	(4.7)	(4.8)
Transparent laws	**-0.328****	**-0.368*****	**-0.192***	**-0.224****
	(0.128)	(0.114)	(0.117)	(0.096)
$Drought_{(t)}$	-0.000	-0.032		
	(0.177)	(0.175)		
$Drought_{(t)}$×Transparent laws	**0.391*****	**0.391*****		
	(0.110)	(0.106)		
$Flood_{(t)}$			0.062	0.058
			(0.057)	(0.057)
$Flood_{(t)}$×Transparent laws			**-0.117****	**-0.120****
			(0.049)	(0.047)
Other controls	Yes	Yes	Yes	Yes
Time-fixed effects	Yes	Yes	Yes	Yes
Obs	1304	1304	1304	1034
AIC	578.427	568.538	583.569	575.499
BIC	790.527	775.466	800.843	792.773

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Standard errors clustered at country level in parentheses. Unless specified, all variables are temporally lagged one year. Mod.(4.5) and (4.7) include pasture land; Mod.(4.6) and (4.8) forest land.

Robustness checks : time fixed effects back

Table 8: Number of events of communal violence (1990-2021)

	(5.5)	(5.6)	(5.7)	(5.8)
Transparent laws	**-0.576*** **	**-0.655*** **	**-0.474*** **	**-0.529*** **
	(0.159)	(0.180)	(0.162)	(0.187)
$\text{Drought}_{(t)}$	-0.225	-0.491**		
	(0.253)	(0.247)		
$\text{Drought}_{(t)}$×Transparent laws	0.075	0.104		
	(0.179)	(0.185)		
Flood			0.098	0.101
			(0.117)	(0.107)
$\text{Flood}_{(t)}$×Transparent laws			-0.054	-0.072
			(0.100)	(0.089)
Other controls	Yes	Yes	Yes	Yes
Time-fixed effects	Yes	Yes	Yes	Yes
Obs	1304	1304	1304	1304
AIC	2550.457	2513.319	2553.468	565.176
BIC	2767.732	2725.419	2765.569	637.458

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: Standard errors clustered at country level in parentheses. Unless specified, all variables are temporally lagged one year. Mod.(5.5) and (5.7) include pasture land; Mod.(5.6) and (5.8) forest land.

Robustness checks: GDPpc non-linear effects

back

Table 9: Likelihood of communal violence (1990-2021)

	(4.9)	(4.10)	(4.11)	(4.12)
Transparent laws	**-0.322*** **	**-0.322*** **	**-0.203***	**-0.230****
	(0.113)	(0.113)	(0.122)	(0.099)
$\text{Drought}_{(t)}$	-0.036	-0.036		
	(0.158)	(0.158)		
$\text{Drought}_{(t)}$×Transparent laws	**0.331*** **	**0.331*** **		
	(0.111)	(0.111)		
$\text{Flood}_{(t)}$			0.041	0.034
			(0.050)	(0.050)
$\text{Flood}_{(t)}$×Transparent laws			**-0.103***	**-0.107****
			(0.057)	(0.054)
(ln) GDPpc	1.834	1.834	1.883	2.444
	(2.597)	(2.597)	(2.470)	(2.521)
(ln) GDPpc sq.	-0.142	-0.142	-0.143	-0.179
	(0.189)	(0.189)	(0.179)	(0.178)
Other controls	Yes	Yes	Yes	Yes
Obs	1304	1304	1304	1304
AIC	543.651	543.651	545.817	202.666
BIC	605.729	605.729	607.895	253.689

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

Note: Standard errors clustered at country level in parentheses. Unless specified, all variables are temporally lagged one year. Mod.(4.9) and (4.11) include pasture land; Mod.(4.10) and (4.12) forest land.

Robustness checks: GDPpc non-linear effects

back

Table 10: Number of events of communal violence (1990-2021)

	(5.9)	(5.10)	(5.11)	(5.12)
Transparent laws	0.013	-0.082	0.023	-0.072
	(0.081)	(0.083)	(0.093)	(0.095)
Drought$_{(t)}$	0.097	0.051		
	(0.149)	(0.153)		
Drought$_{(t)}$×Transparent laws	**0.229****	**0.204***		
	(0.154)	(0.163)		
Flood$_{(t)}$			**0.090****	**0.088****
			(0.043)	(0.043)
Flood$_{(t)}$×Transparent laws			0.007	0.004
			(0.055)	(0.057)
(ln) GDPpc	3.052	1.441	3.244	1.741
	(2.296)	(2.136)	(2.280)	(2.134)
(ln) GDPpc sq.	-0.235	-0.096	-0.249	-0.118
	(0.174)	(0.160)	(0.173)	(0.159)
Other controls	Yes	Yes	Yes	Yes
Obs	1304	1304	1304	1304
AIC	2226.255	2239.060	2227.405	2238.887
BIC	2293.506	2306.312	2294.656	2306.138

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

Note: Standard errors clustered at country level in parentheses. Unless specified, all variables are temporally lagged one year. Mod.(5.9) and (5.11) include pasture land; Mod.(5.10) and (5.12) forest land