Mapping Municipal Change in Tunisia

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Before 2016, around one-third of Tunisians—some 3.6 million people—lived in rural sectors outside of the country's 264 municipalities, with no elected representation at the local level. Beginning in 2015, the government undertook a process to extend municipalities continuously throughout the territory by creating new municipalities and expanding existing ones to incorporate rural sectors and populations. In the absence of publicly available data on the location of both old and new municipal boundaries, I created a geospatial dataset to study this process by aggregating lower-level administrative units to approximate these changes using data from multiple administrative sources and Open Street Map (OSM).

This dataset has a number of applications. In this note, I demonstrate how it can be used to visualize the distribution and change in municipalities and communal populations across Tunisia over the past few decades, and to better understand the process (and potential politics) behind these changes. In addition, I preview how the data can be used to explore the consequences of this mass-enfranchisement on local governance and political development, including by shaping electoral outcomes and dramatically expanding the territory and population for which municipal councils must deliver basic services.

Tunisia's local governance structures

Following Tunisia's independence in 1956, political power was increasingly centralized, with regional and local governance structures designed primarily to exert territorial control and subvert tribal and community identities in favor of "nation building."[2] These structures have persisted in the post-Ben Ali era, and consist of layers of centrally-dependent administrative units throughout the territory, anchored by 24 governorates (*wilayat*) that as of the 2014 Census were divided into 264 delegations (*muatamdiyat*) and 2084 sectors (*imedat*). Figure 1 shows an example of these territorial divisions in the governorate of Ariana in the northeastern capital region.

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[2] See, inter alia, Amor Belhedi. "Maillage administratif régional et régionalisation en Tunisie : Continuité et rupture." *Revue Tunisienne de Geographie*, 44-45 (2016) : 51-88 and Mourad Ben Jelloul. "Régionalisation et découpage territorial en Tunisie : De la gestion centralisée à la gouvernance territoriale" in Hayder, A. and Cherif, M. (eds.) *Les découpages territoriaux*. Faculté des Sciences Humaines et Sociales de Tunis, (2018): 29-58.

Figure 1. Example of territorial divisions in Tunisia (2014)

Ariana
Governorate in Gran Tunis
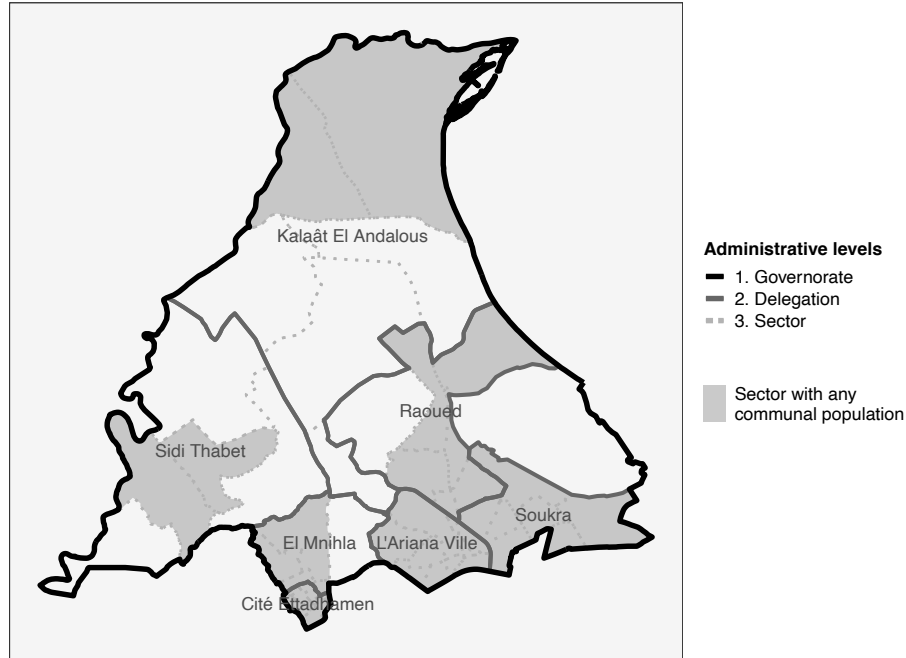
In parallel to these administrative entities, however, the post-independence Tunisian state has progressively granted some limited autonomy to selected municipal areas or *communes*, including the ability to elect local councils and raise some of their own revenues.[3] The incorporation of municipalities thus divided the country into two groups, reflected in census categories: (1) "communal" populations in urban or suburban areas under the jurisdiction of elected municipal councils, and (2) and "non-communal" populations in more peri-urban or rural areas governed by unelected rural councils.

Although these municipalities were a separate structure, they have generally corresponded with administrative levels. For example, municipalities typically contain the population of multiple sectors, and as of 2014 the majority of sectors had either 100 percent communal or 100 percent rural populations (i.e., their populations were either entirely inside or outside a municipality). However, there have also been "mixed" sectors with both communal and non-communal populations (see Figure 2), and even for sectors with 100 percent communal populations, it is possible that the municipal borders fell inside sector boundaries if certain parts of the sector were uninhabited, as is common in the southern desert regions.

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[3] As with administrative structures, the creation of municipalities was often used as a tool of control, to reward supporters or punish rivals under the Bourguiba and Ben Ali regimes, as summarized in Intissar Kherigi. "Municipal Boundaries and the Politics of Space in Tunisia." Working Paper 38 (University of Gothenburg: Program on Governance and Local Development, 2021).

Figure 2. Sector population type

Population type
in 2014
■ Communal
■ Mixed
□ Non–communal
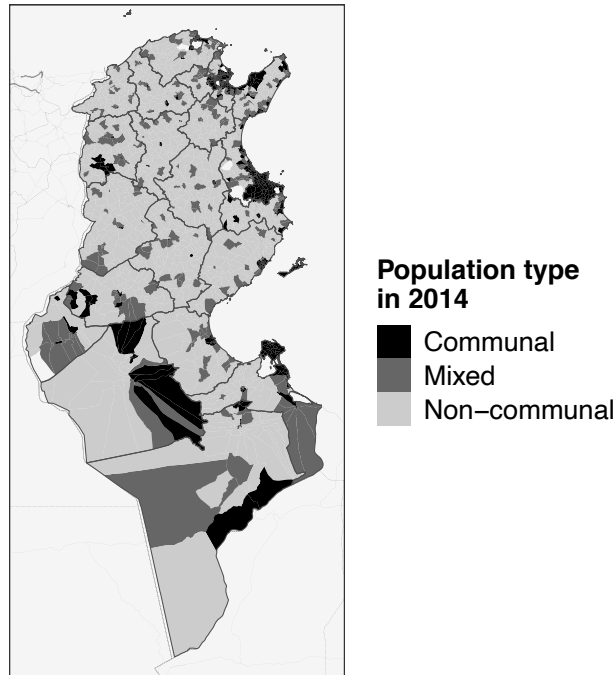
As a product (and perpetuator) of regional inequalities, municipalities were clustered in coastal areas, while non-communal areas were largely concentrated in the marginalized interior and southern governorates. However, because decentralization and "positive discrimination" these regions were key demands of the 2011 revolution, the 2014 Constitution included requirements to increase the power of municipal councils and extend their jurisdictions to cover the entire territory. Under this mandate, the Ministry of Local Affairs (MAL) carried out a process of "generalizing" municipalities to make them continuous across the territory between 2015 and 2017, expanding some old municipalities and creating 86 new ones for a total of 350.[4]

Although the Government released a PDF with maps of the new municipalities,[5] official shapefiles or other systematic data on the precise location of these new municipal boundaries had not been published as of 2020.[6] To quantitatively analyze this process and its implications, I therefore created

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[4] Ministry of Local Affairs (MAL). "Report on the Proposed Generalization of the Municipal System" (Government of Tunisia, 2016, in Arabic). For an in-depth analysis of this process, see Kherigi, "Municipal Boundaries and the Politics of Space in Tunisia."

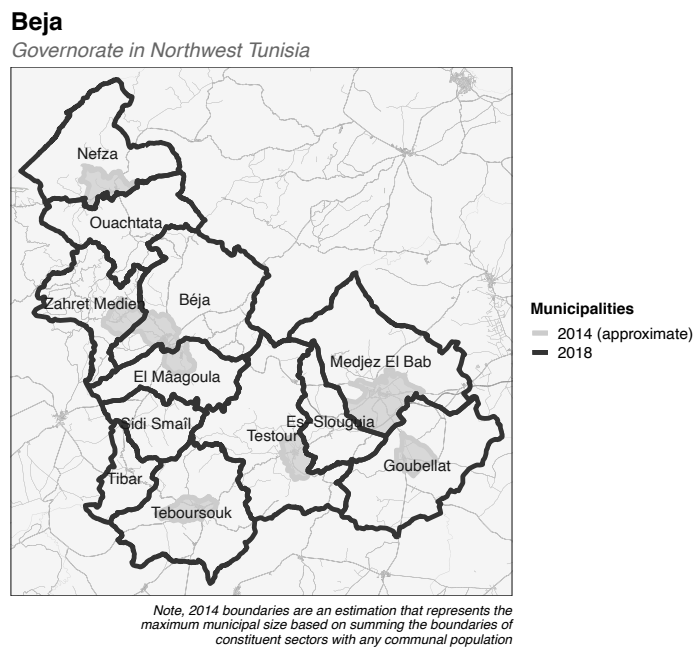[5] Ministry of Local Affairs (MAL). "Municipal Strategy" (Government of Tunisia, May 2016, in Arabic).

[6] To my knowledge, official municipal-level shapefiles have not been publicly released by the Tunisian government. An extensive online search revealed official shapefiles only down to the delegation level (e.g., via GADM). According to

a spatial dataset to approximate changes in municipal boundaries by matching sectors to municipalities over time.

Methodology and Data

Matching sectors and municipalities. I used three primary sources to match each of Tunisia's 2085 sectors to municipalities in 2014 (the year of the last census, before municipal generalization) and in 2018 (the year of the first democratic local elections, after municipal generalization).[7] The first is the 2014 census data,[8] which gives the population of each sector that lives in communal and non-communal areas. I matched this information with the total census population for municipalities to determine which sectors were all or partially incorporated into each of the 264 municipalities existing in 2014. As noted above, sectors are the lowest level administrative unit that is largely subsumed by municipalities, and therefore aggregating the boundaries of sectors that contained some communal population in 2014 provides an outer bound for the location of municipalities at that time.

Figure 3. Expansion of municipality boundaries from 2014 (approximate) to 2018

Note, 2014 boundaries are an estimation that represents the maximum municipal size based on summing the boundaries of constituent sectors with any communal population

Second, I used the report produced by the MAL in 2016[9] with the first comprehensive information on the new municipalities. This included PDF maps of the proposed 350 municipalities and their

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Kherigi, "Municipal Boundaries and the Politics of Space in Tunisia," the MAL had not yet finalized detailed boundaries for all municipalities as of June 2020.

[7] As of 2014, there were 2084 sectors. A new sector, Ouled El Felah, was created in Sidi Bouzid in 2015 (Decree 2015-0296, published in JORT 2015-028).

[8] National Statistics Institute. "2014 Census" (Government of Tunisia, 2014).

[9] MAL, "Municipal Strategy."

sectors, and codes indicating whether a municipality was "no change" (previously incorporated and comprised of 100 percent communal sectors), "new" (newly incorporated out of previously rural sectors), or "expansion" (already existed and gained new sectors and/or had mixed sectors with rural populations that were newly incorporated).[10] A manual comparison of the municipal sectors and type in this PDF with the 2014 census data enabled me to match sectors to both the 2014 and 2018 municipalities. Finally, I reconciled the 2018 sector-municipal assignment with sector-level data from the 2018 elections[11] to account for changes that happened after the 2016 MAL announcement.[12] In total, there were at least 23 municipalities where sectors assignments changed between May 2016 and May 2018.

Sector classification. With the above data, I created a typology of sectors shown in Table 1 to study the municipal assignment process. First are communal or mixed sectors that were previously incorporated into one of the 2014-era 264 municipalities. This includes: (a) sectors in old, "*unchanged" municipalities* (n=442); (b) sectors that were part of expansion municipalities and served as the *"node"* of their expansion (n=506); and (c) a small number of sectors that *changed* municipalities between 2014 and 2018 (n = 44).[13] Second are rural sectors with non-communal populations that were incorporated into municipalities for the first time, either as (a) *peripheral* sectors added to existing expansion municipalities (n=739) or (b) as part of entirely *new* municipalities (n=351). In Figure 3, for example, all sectors in Es-Slouguia, Ouchtata, Sidi Smail, and Tibar are newly incorporated into new municipalities, while all others are expansion municipalities where the shaded areas are "nodes" (representing the sectors previously included in these municipalities) and the unshaded areas are the "peripheral" rural sectors that were recently added.

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[10] A few municipalities, notably Gafsa and El Kef, were marked as "no change" but based on 2018 election data appear to each have lost a few sectors.

[11] Sector-level election data comes from the Electoral Commission (ISIE) and a longitudinal dataset developed for Julia Clark, Alexandra Blackman, and Aytuğ Şaşmaz. "What Men Want: Politicians' Strategic Response to Gender Quotas." (Working paper, 2021).

[12] As noted by Kherigi, "Municipal Boundaries and the Politics of Space in Tunisia," the process of drawing municipal boundaries was contentious, with various local and national actors mobilizing to change boundaries as initially announced by the MAL.

[13] In some cases, these sectors switched from one pre-existing municipality to another; in others they were part of an existing municipality and split off to become a new municipality (e.g., the municipality of Ettadhamen-Mnihla in Ariana became two municipalities: Ettadhamen and Mnihla).

Table 1. Sector typology

2018 Municipal Assignment	Sector Population Type in 2014			
	Communal	*Mixed*	*Non-communal*	**Total**
Previously incorporated				
Unchanged municipality	442	0	0	442
Expansion node	236	269	0	505
Changed or split	29	15	0	44
Newly incorporated				
Expansion periphery	0	0	740	740
New municipality	0	0	351	351
Total	707	285	1,090	2,082

Note: Excludes two sectors with no recorded population (Lile de la Gualite in Bizerte and Ain Ouled El Gerissi in Tozeur) and one created after the 2014 census (Ouled El Felah in Sidi Bouzid).

Creating shapefiles. I then used the matching of sectors to municipalities to create shapefiles for both the old and new municipal boundaries, as shown in Figure 3**Error! Reference source not found.**. This was accomplished by merging the sector-municipal mapping above to a sector-level OSM-derived shapefile in R,[14] and then dissolving the sectors to both the old (2014) and new (2018) municipalities.[15] In addition, I used the census and 2018 elections data to correct some errors in the sector boundaries, and follow similar procedures to create improved shapefiles at the delegation, governorate, electoral district, and regional levels. All shapefiles include standardized administrative codes and names in Arabic and English, and are available for download and use on GitHub.[16]

Limitations. There are some limitations to this data. First, 2014 and 2018 municipal shapefiles are based on 2017 sector boundaries from OSM, which may be inconsistent to some degree with the official boundaries established by the government, particularly if sector boundaries have shifted over time.[17] Second, while the 2018 municipal shapefile is likely to approximate the true boundaries—given that municipalities are now contiguous and cover all parts of sectors—the 2014 municipal shapefile boundaries include the entirety of sectors with *any* communal population, which means they include rural parts of sectors that were not actually within the true municipal boundaries. The 2014 municipal shapefiles should therefore be seen as an approximation that overestimates the geographic size of certain municipalities, particularly those that include "mixed" sectors with large rural populations or large geographic areas (this includes, for example, many

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[14] Sector level shapefiles from the OSM Cartographie Citoyen project, available at http://kcit.org/site0/index0.html?#art_DM-Fonds%20de%20cartes%20Tunisie%20OdBl.

[15] The Cartographie Citoyen projects and others—e.g., the "Administrative Structures" map on the http://www.tunisieelections.org website produce by Democracy international—have followed a similar procedure, creating a map of 2018 municipalities using MAL, "Municipal Strategy"; however, these do not appear to account for post-2017 changes and some inconsistencies in the MAL data.

[16] See https://github.com/jmgclark/tunisia_shapefiles.

[17] Kherigi documents multiple cases where sector boundaries changed during the 2015-2017 municipal generalization process or where municipality boundaries cut across sectors, but it is not clear how widespread these deviations are.

municipalities in the desert regions of Kebeli, Tozeur, Tataouine and Medenine). These boundaries can be improved with additional administrative and spatial data.

Applications

The above data have a number of uses that will be explored in more depth in future work. In this note I focus on three specific applications for this dataset: (1) modeling the boundary-making process, (2) exploring the consequences of these changes on local and national politics, and (3) understanding logistical governance challenges in new and expanded municipalities.

Boundary politics. According to the MAL's stated process,[18] boundaries were determined centrally based on technocratic criteria—including population size, geographic area, and development indicators—rather than by political bodies, and so the scope for largescale manipulation was limited. Indeed, initial tests provide no evidence of national-level partisan influence on the allocation of rural sectors to existing versus new municipalities, suggesting that this process was *not* a product of classic gerrymandering tactics such as concentrating supporters in certain municipalities or splitting up the opposition.[19] At the same time, given the importance of municipalities for local development, elections, and party building,[20] local politicians and communities have a clear interest in shaping boundaries to their benefit.[21] This dataset provides the foundation for a more systematic analysis of the politicization and contestation of Tunisia's municipal spaces in the post-Ben Ali era.

Election results. These data can also be used to examine the effects of municipal generalization and expanding the local franchise on electoral outcomes. For example, I create a counterfactual using 2014 boundaries to look at levels of competition and turnout in the 2018 elections.[22] As shown in the "Actual" columns in Table 2, expansion municipalities had slightly more competitive lists and

[18] As described in MAL, "Report on the Proposed Generalization of the Municipal System."

[19] In a logistic regression controlling for population and area (two MAL criteria), sectors with more votes for Nidaa in the 2014 elections were more likely to be assigned to existing municipalities, while those with more votes for Ennahda and independents were more likely to be assigned to new ones. However, this effect disappears with governorate fixed effects, given the high correlation between region, municipal concentration, and historical support for specific parties. For a deeper discussion of the colonial and geographic legacies of political party affiliation in Tunisia and elsewhere, see Alexandra Blackman, "Ideological Responses to Settler Colonialism: Political Identities in Post-Independence Tunisia." Working Paper (2021), and Janine A. Clark, *Local politics in Jordan and Morocco: strategies of centralization and decentralization* (New York: Columbia University Press, 2018).

[20] Multiple studies across a variety of contexts have demonstrated the importance of municipal party "machines" for both local and national politics, such as mediating patronage and clientelist networks (see, for example, Susan Stokes, Thad Dunning, Marcelo Nazareno, and Valeria Brusco. *Brokers, voters, and clientelism: The puzzle of distributive politics*. Cambridge University Press, 2013).

[21] Kherigi, "Municipal Boundaries and the Politics of Space in Tunisia" documents multiple cases where a technocratic approach appears not to have been applied consistently, and was in some cases captured by local clientelistic interests. As a result of this and some unpopular decisions (e.g., splitting up existing municipalities) many of the new municipal borders became hotly contested.

[22] All election data come from Clark, Blackman, and Şaşmaz, "What Men Want: Politicians' Strategic Response to Gender Quotas."

smaller margins of difference than old municipalities in the 2018 elections, but slightly lower turnout, consistent with historical patterns in rural sectors.[23] However, if we aggregate results to municipalities' 2014 boundaries—i.e., excluding votes from newly added sectors—there is no significant difference between old and expansion municipalities on these measures. Future analyses will provide more a more robust analysis of this impact and persistent effects for the 2019 parliamentary elections.

Table 2. Competitiveness in the 2018 municipal elections

	Effective Number of Lists		Margin of Difference		Turnout (% of population)	
Type of municipality	Actual	2014 boundaries	Actual	2014 boundaries	Actual	2014 boundaries
Expansion (n = 187)	4.44 (1.50)	4.24 (1.43)	0.11 (0.10)	0.13 (0.13)	0.18 (0.05)	0.21 (0.07)
Old (n = 77)	4.26 (1.42)	4.26 (1.42)	0.14 (0.11)	0.14 (0.11)	0.22 (0.07)	0.22 (0.07)
New (n = 86)	3.89 (1.17)		0.13 (0.10)		0.18 (0.07)	
Total municipalities	350	264	350	264	350	264
p-value	0.028	>0.9	0.058	0.2	<0.001	0.4

Note: Effective number of lists is calculated using a Herfindahl–Hirschman Index, margin of difference is the difference in vote share between first- and second-placed lists, and turnout is the percent of votes cast divided by the population (excludes blank or cancelled votes, as this data is not available). Results in the "actual" column are the observed results from the 2018 elections with the true 2018 boundaries. Results in the "2014 boundaries" column report the results only for those sectors that were part of the municipality in 2014 (i.e., excluding the newly added sectors). Columns report the mean and standard deviation (in parentheses), and p-values are calculated across municipal type using a Kruskal-Wallis rank-sum test.

Governance challenges. As of 2014, municipalities were highly concentrated in the northeast (particularly in the Grand Tunis capital area) and center-east Sahel regions, and nearly half of these (68 out of 154) remained unchanged in 2018.[24] In comparison, as Table 3 shows, a large majority of existing municipalities in interior and southern regions were expanded as of 2018 (101 out of 110). In the governorates of Kairouan, Kasserine, and Sidi Bouzid, the median municipality increase in population size by approximately 71 percent, and in geographic area by over 500 percent. These changes have important implications for the capacity of newly formed or expanded municipal governments to meet the increased expectations for service delivery under decentralization and—if unaddressed—have the potential to widen regional inequalities.

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[23] During the 2011 and 2014 national-level elections, rural sectors had consistently lower turnout levels, more competitive lists, and lower margins of difference than communal sectors, suggesting that their citizens were less politically engaged and ideologically polarized than in municipalities.

[24] The historic concentration of municipalities in the northeast and center east reflects the higher levels of urbanization on the coast but well as the clientelistic incorporation of more municipalities in favored governorates like Monastir during the Bourguiba regime (see Kherigi, "Municipal Boundaries and the Politics of Space in Tunisia").

Table 3. Municipal characteristics by type (2014 to 2018)

Region	Type	N	Population (median)			Area in km² (median)		
			2014	2018	Change	2014*	2018	Change
Northeast Ariana, Ben Arous, Bizerte, Mannouba, Nabeul, Tunis, Zaghouan	Unchanged**	25	42,518	42,518	0%	17.1	16.0	0%
	Expansion	52	21,113	27,607	32%	39.0	97.7	107%
	New	14		19,360			183.5	
Northwest Beja, Jendouba, Le Kef, Siliana	Unchanged	1	9,807	9,807	0%	173.2	173.2	0%
	Expansion	37	9,634	20,155	58%	36.8	360.6	552%
	New	15		12,830			169.4	'
Center East Mahdia, Monastir, Sfax, Sousse	Unchanged	43	12,962	12,962	0%	20.8	20.8	0%
	Expansion	34	11,629	29,303	63%	51.5	182.1	305%
	New	13		18,914			152.1	
Center West Kairouan, Kasserine, Sidi Bouzid	Unchanged	0						
	Expansion	32	9,731	25,044	71%	48.5	422.4	593%
	New	23		15,507			256.3	
Southeast Gabes, Medenine, Tataouine	Unchanged	6	45,790	45,790	0%	(*)	161.1	
	Expansion	16	10,633	17,772	33%	(*)	720.7	
	New	11		13,310			318.6	
Southwest Gafsa, Kebili, Tozeur	Unchanged	2	13,409	13,409	0%	(*)	712.0	
	Expansion	16	21,101	22,265	15%	(*)	827.7	
	New	10		10,480			642.7	

*Geographic area estimates for 2014 present an upper bound, based on adding together the areas of all sectors that had some communal population within each municipality in 2014; they will overestimate size in cases where these sectors had significant rural popuatlions, and in the Southern regions where sectors are large with sparse populations. For this reason, 2014 areas are not reported for the Southeast and Southwest.

** "Unchanged" is the Ministry of Local Affairs designation in 2016; however, as of 2018 a few of these municipalities had changed or lost sectors.

Source: 2014 Census (INS) and Ministry of Local Affairs (2016).

Conclusion

The incorporation of more than a third of the Tunisian population into local politics has important implications for democracy. In addition, the significant increase in many existing municipalities' geographic space and population impacts their capacity to meet the heightened expectations for service delivery under the new constitution and municipal code. However, the lack of official geospatial data on these changes makes it difficult to quantify or systematically study this process or its impact. The dataset described in this note attempts to fill this gap by synthesizing approximate municipal boundaries using data from multiple sources. A similar approach may be useful in other countries with shifting administrative units and incomplete data.

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