

Geographic Phases of Diffusion of December 2018 Revolution in Sudan

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Abstract

This research is exploratory and inductive in nature works to investigate the geographic phases of diffusion of December 2018 revolution in Sudan with emphasis on its geographic sequential setting and geographic decay. The sources of data were the observed and recorded events of the revolution during the period of December 2018 up to June 2022, as well as the published relevant literature. Expert-observations and live-experience by the author were basic tools for data collection and spatial analysis. Exploration and scrutiny of data showed that, progressive spatial developments of the revolution and its geographic transmissions were not geographically contagious and geographic centers for diffusions were not necessarily neighbored; however, they were unevenly and discretely dispersed over the geographic space of Sudan's and the world's map. There were obvious geographic sequential settings of December 2018 revolution, as well as a witnessed geographic decay which was coincided with sit-in breaks up. This has diminished the revolution from a wide geographic domain to a narrow domain in Khartoum State, and further to a narrower domain in some old residential areas in Khartoum towns. These old residential areas exhibited localized revolutionary expressions and verified place contents of limitation, tangency, location privileges, transboundary linkages, and enhancement by human constructs. The geography of December 2018 needs to be assessed for scrutiny of political and socioeconomic conditions of Sudanese communities.

Key words: geographic diffusion, geographic contagion, geographic pulse, geographic decay

المراحل الجغرافية لانتشار ثورة ديسمبر 2018م في السودان

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مستخلص:

هذا بحث استطلاعي وإستقراءي في طبيعته يعمل على تقصي المراحل الجغرافية لانتشار ثورة ديسمبر 2018 في السودان مع التركيز على وضعية تسلسلها المجالي وانحسارها الجغرافي. تمثلت مصادر البيانات في الأحداث الملاحظة والمسجلة للثورة خلال الفترة من ديسمبر 2018 وحتى يونيو 2022م بجانب الأدبيات المنشورة ذات الصلة. لقد كانت الملاحظة-القائمة على الخبرة والتجربة المعاشة بمثابة أدوات أساسية لجمع البيانات والتحليل المجالي. أظهر استطلاع تلك البيانات وتدقيقها بأن التطور المجالي المتسلسل للثورة وانتشارها الجغرافي لم يتخذ صفة العدوى الجغرافية الناتجة من الجوار الجغرافي بل نجد أن المراكز الجغرافية لانتشارها لم تكن بالضرورة متجاورة وإنما توزعت بغير انتظام منفردة فوق الفراغ الجغرافي للسودان وخريطة العالم. هناك أوضاع جغرافية متسلسلة واضحة لثورة ديسمبر 2018 وبالمثل انحسارها الجغرافي الذي ارتبط بفرض الاعتصام. لقد اتكملت هذه الثورة من المجال الجغرافي الواسع إلى المجال الجغرافي الضيق في ولاية الخرطوم وأكثر إلى مجال جغرافي أضيق اقتصر على بعض المناطق السكنية القديمة في مدن الخرطوم الثلاثة. وقد أظهرت هذه المناطق السكنية القديمة تعبيرات جغرافية أكثر محلية والتي أكدها المحتوى المكاني للاقتصر والتماس المكاني وامتيازات الموقع والارتباطات الحديثة النقلية ودعم المنشآت البشرية. تحتاج جغرافية ثورة ديسمبر 2018م للتقييم لأجل تقصي الأحوال السياسية والاقتصادية-الاجتماعية للمجتمعات السودانية.

Introduction:

Sudan has entered since 16 December 2018 and up to April 2019 in a state of revolution against Ingaz Regime. For eight months, Sudan was gripped by an unprecedented mass movements determined to overthrow the 30 year dictatorship of Omer al-Basher (Wainwright, 2020). The earlier revolutionary expressions included small protests in some Sudanese towns, sit-in around the Military Headquarters in Khartoum, mass movements in several Sudanese towns and cities, and protests of Sudanese in the Diaspora. However, through time those revolutionary expressions were confined to barricades; exclusive protesting by some old residential areas and peripheral ones in Khartoum State. They were, somehow, accompanied by occasional unlawful behaviors during and after some revolutionary expressions.

This research objects to investigate the geographic phases of diffusion of December 2018 revolution in Sudan, its geographic sequential setting besides, and the patterns of its geographic decay. It also objects to discuss its causes, role of social media and urbanization in increasing riots, causes of its confinement to old residential areas in the three towns of Khartoum State, and the emergence of some ethnic riots and their restriction to some peripheral residential areas. This will be through trying to answer the raised two questions: Is there a geographic sequential setting of December 2018 revolution? What patterns of the geographic decay of December 2018 revolution? Data on rebel and revolutionary expressions in the towns and cities of Sudan and Khartoum State was aggregated as based on continuous expert- observations and daily experience of the author during the period of December 2018 up to June 2022. The relevant literature was also used. The analysis of data was autonomous, qualitative and spatially interpreted and encompassed all phases of diffusion of this revolution. There was a focus on geographic contingency analysis and its role in disseminating revolutionary activism.

Theoretical background

Contagion is a concept that sociologists have used to describe impulses from one group to another. Contagion was assumed in some early studies of contagion in political events whenever events were contagious in time and space (Bohstedt et al., 1988). Diffusion is the name given to the adoption of innovations by communities; its analysis is well established in many branches of social science-rural sociology, geography, economics and mass communication theory. Analysis of diffusion until about 1960, tended to focus on channels of communication as the key variable in the diffusion of innovation. Diffusion refers also, to a class of mechanisms by which armed conflict spreads across space and time (Alcock, 1972). The diffusion of rebel and violent behavior

requires conditions such as location currently experiencing rebel and violent behavior, and a location susceptible to rebel and violent behavior. Here, the person's decision to riot is interplay of social network analysis, geospatial landscape, heterogeneous population, daily activities of the residents, and human behavior, especially that related to an individual's identity and the role of rumors (Pires et al., 2017). These could somehow fit with several types of diffusion in riot cycle, demonstrating that contagious influence from riots decays over time, is mitigated by geographic distance, and is consolidated on riot severity (Myres, 2010). Support for theories of spatial contagion suggest that there was "a degree of coordination amongst rioters and policy activity did not just suppress rioting, but dampened the influence of contagion, without displacement" (Baudains et al., 2013).

Violence is a confusing concept. It frequently defies explanation and lacks an agreed upon definition. Yet geographers are well positioned to bring greater conceptual clarity to violence by thinking through its intersections with space (Springer et al. 2016). Violence deepens antagonism and reduces support for compromise, while others contend it encourages moderation and concessions to prevent further conflict. There is considerable evidence linking strategic aspects of ethnic identity construction to violence and more limited evidence implicating discursive systems. Choice; constructivism; essentialism, and structuralism are the four main approaches that have been applied to the study of ethnic conflict. Large scale ethnic violence is provoked by elites, often motivated by intra-ethnic conflicts (Fearson et al. 2000). Politics and society are driving factors of security and privacy behavior and app adaptation. Under reasonable assumptions regarding attitudes toward risk, the overall effects of organized political violence are likely to be much higher than its direct capital destruction impact.

There are three levels of political violence which are riots,

coups, and civil war. Organized political violence, especially civil war, lowers long-term economic growth and “ethnic fractionalization have negative and direct effect on growth, though its effect is substantially ameliorated by the institutions specific to non-fractional partial democracy” (Bodea et al. 2008). Previous research has showcased how a violent anti-government campaign in one country increases the likelihood of violent anti-government in others. Similarly, a nonviolent anti-government campaign in one country increases the likelihood of nonviolent anti-government campaigns in other countries. Furthermore, the lesser the distance between two countries, the greater this proposed diffusion effect gets, i.e. the likelihood of anti-government campaign diffusion increases as distance decreases (Chris, 2020). Riots increase cooperation within the warring groups, while cooperation across groups is reduced (Hager et al. 2019).

The riots are important as an event which reveals much about the complexity of power, space, and identity (Foxall, 2010). Understanding how offences spread in space and time can provide insights regarding the mechanisms of contagion, and of the risks of events spreading between contagious areas. In particular, we differentiate between four space-time signatures: “flashpoints” of disorder which appear out of nowhere, “containment” whereby already affected areas experience further events, “escalation” whereby rioting continues in affected areas and spreads to those nearby, and “relocation” whereby the disorder moves from on locality to those adjacent. There was support for theories of spatial contagion which suggest that there was a degree of coordination amongst rioters. They also show that police activity did not just suppress rioting, but dampened the influence of contagion, without displacement (Baudains et al., 2013). The perceived advantage of distance over other key geographical concepts was that distance instantiates an objective physical property. As such it could be

easily measured, quantified, and deployed (Simandan, 2020). Opportunities for rebel and violent behavior to relocate, expand or persist depend greatly on rebellions ability to transport weapons, personnel, fuel, narcotics, etc.

Geographic sequential settings of December 2018 revolution

The peaceful protests started on the 13th of December 2018 in Damazin town in southeast Blue Nile, went into a higher level on the 19th of December in Atbara town in central North of Sudan and then into Gadarief towns in Eastern Sudan. It took a qualitatively different shape when it involved the professionals on the 25th of December (Arman, 2019). Following these progressions, Burri suburb and Suq Arabi commercial market in Khartoum town became involved in those protests. And further progressively many Sudanese regional capitals became involved in these protests including Port Sudan; Kassala; El-Obied; Kosti; and Wad Madani (table 1, Figure 1). It is obvious that, the initiation of December 2018 revolution was a weak pulse in a regional capital of a 13th order of cities in Sudan which was successively empowered by the involvement of many regional capitals with a higher order of cities in Sudan (Table 1).

Table 1: Geographic sequential of protests of December 2018 revolution in Sudanese cities and towns According to population size and order during

City/ town	Order by involvement	Population size	City Order
Damazin	1	186,051	13 th
Atbara	2	107,930	20 th

City/ town	Order by involvement	Population size	City Order
Gadarief	3	363,945	7 th
Port Sudan	4	489,725	4 th
Kassala	5	401,477	5 th
El-Obied	6	393,311	6 th
Kosti	7	345,068	8 th
Wad Madani	8	332,714	9 th

Source of population data and order of cities: World Population Review, 2022

As was in 1985, these protests have shifted from their early focus on the cost of the bread toward a decisively political emphasis on the toppling of the President Umer al- Bashir and his ruling National Congress Party. This is almost similar to 19th December 2013 when protests against rising food prices erupted in Atbara and spread to the rest of the country where the uprising has lasted just over two months. The September 2013 protests in Khartoum in response to the lift in oil subside has been widespread and violent (Puri, 2014). The removal of President al-Basher and the takeover by the military did nothing to convince protesters to go home or dampen their call for regime change. Crowds of protesters continue to demonstrate, rejecting the military's move as a regime coup, and demand the handover to a civilian transitional regime (El-Gizouli, 2019). Lieutenant-General Abdel Fattah al-Burhan's post-coup government has not followed through on promises to suspend the price increases, and the protests have escalated.

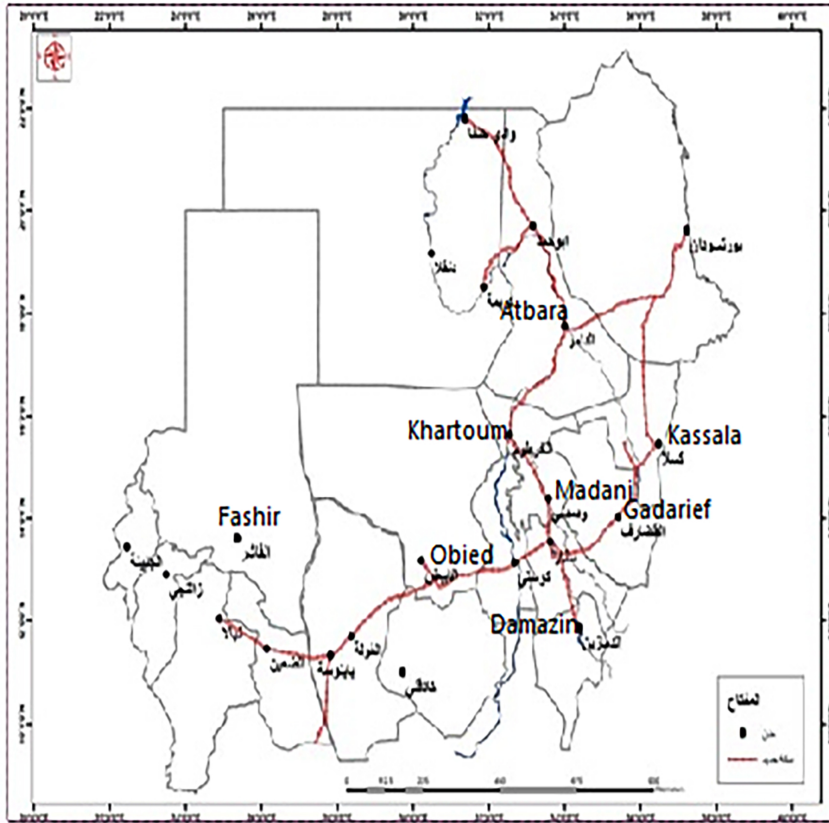


Figure 1: Major towns of uprising of 18 December revolution in Sudan

These protests are less Khartoum focused than the previous movements in 1964 and 1985 as were demonstrated by the prominence of the hashtag “cities of Sudan rise up”. This is because of the rise of social media activism has enabled rebels to spread from regional cities such as Atbara to Khartoum and elsewhere much more speedily. The marginalized regions that are being reported on during December 2018 uprising are not those that international audiences are used to hearing about, they were of towns of northern, eastern and central Sudan instead of Darfur and south Kordofan (Berridge, 2020).

The protests in Khartoum State were focused in the area surrounding the Military Headquarters (Figure 2) where the idea was to hold a peaceful sit-in there. It lasted fifty-eight days and represented a space territory of political exercise and challenged the current relationship between public space and the political ideology by providing a new example of what approach space is (Bahreldin, 2020). The space of sit-in was full with political, social, cultural, and economic /cultural activities. There were some major constructs included barricades, control points, the main stage, and service points.

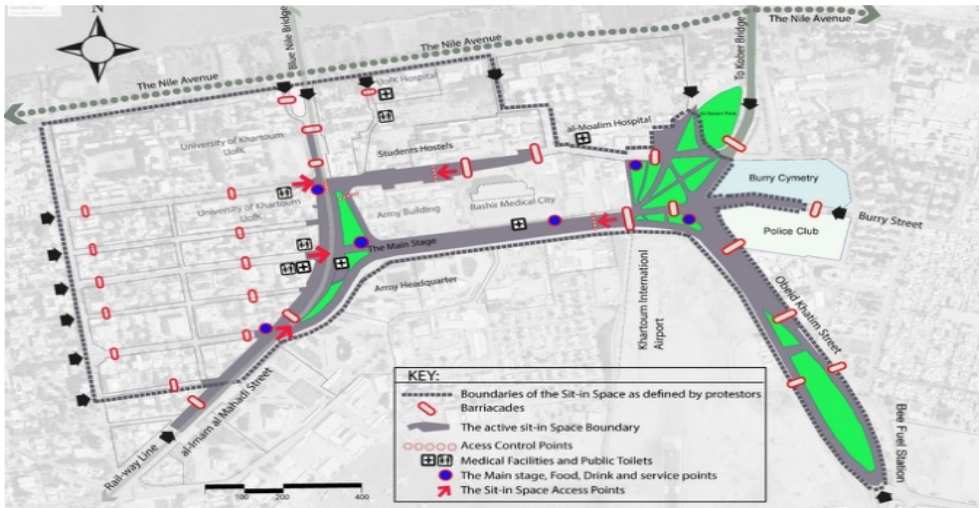


Figure 4. The sit-in space as of 29 May 2019. This map shows the major spatial constructs, including barricades, control points, the main stage, and service points.

Figure 2: The sit-in space as of 29 May. The map shows the major spatial constructs, including barricades, control points, the main stage, and service points.

Source: (Bahreldin, 2020)

The revolution has witnessed a Sudanese Diaspora involvement over the globe beyond the dichotomies of ethnicity, religion and regions (Arman, 2019). Nearly five million Sudanese live abroad, according to Sudan government estimates, distributed

mainly between the Middle East, Europe, North America, and Australia. Large solidarity protests have taken place around the world in cities such as New York, San Francisco, London, Paris, and Brussels (Kushkush, 2019) Sudanese Diaspora activism and involvement with the revolution through translation and narration of the revolution using various forms of linguistic and cultural mediation in order to globalize the local and conform to the expectations of an international audience. The slogan “tasgyt bas” or “just go”, Freedom, Peace, and Justice, plays a significant role in rallying the Sudanese people behind the political change in their quest for achieving freedom, peace, and justice (Alkordi et al. 2021).

The general forms of *progressive spatial developments of revolutionary expressions* of December 2018 revolution prior to sit-in breaks up, took ordinal sequential geographic settings (figure 3) as follows:

- 1- The initial geographic point of pulse initiation was Damazin town in south-eastern Sudan. It was a weak pulse **in a regional capital of a 13th order of cities of Sudan.**
- 2- The first point of reception of that pulse was Atbara town in central North Sudan, which is a **20th order of cities in Sudan.** It has strengthened that pulse of initiation due to its past cumulative revolutionary experiences.
- 3- The third and fourth reception points of that strengthened pulse of initiation were Burri district and Suq Arabi (a commercial area in central Khartoum). These both reception points could be geographically considered as **sub-urban and market area domains.** They formed points for further initiations, enhancement and empowerment of revolutionary expressions.
- 4- Involvement of the **regional capital of Gadarief which is a 5th order of cities of Sudan.**
- 5- Involvement of regional capitals of higher order of cities in

- Sudan such as Port Sudan, Kassala: with 401,477 population size (5th order); El-Obied: with 393,311 population size (6th order); Kosti: with 345,068 population size (8th order); and Wad Madani: with 332,714 population size (9th order), which have further created revitalizing pulses of revolutionary expressions and became geographic centers of further continuation of the revolution.
- 6- The main point of focal concentration of protestors in Khartoum town was around Military Headquarters (sit-in). Here, revolutionary expressions became more confined to the National capital of the country which is the first order city of Sudan. Omdurman has the most population with 2,395,013; Khartoum town with 1,974,647 population size; and Khartoum North with 1,012,211 population size, and the Khartoum metropolitan area with 5,274,321 population size (World Population Review, 2022).
 - 7- There were so many geographic points of revolutionary expressions of Sudanese in Diaspora (outer geographic **points of concentration in Europe, USA, Australia, etc).**

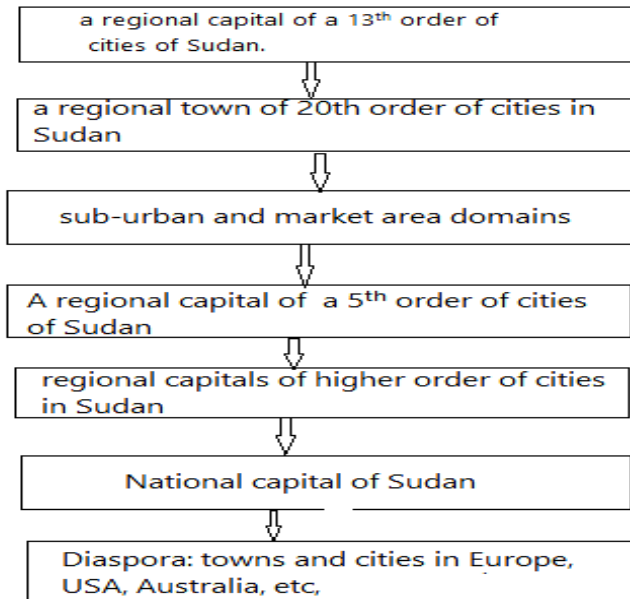


Figure 3: ordinal of sequential geographic settings of December 2018 revolution
(Prior to sit-in breaks up)

These progressive spatial developments of revolutionary expressions could indicate to that, geographic transmission of the pulses of the revolution expressions were in general, not geographically contagious; however, they were geographically disseminated inside and outside the country. The geographic centers for diffusion were not necessarily neighbored; however, they were unevenly discretely dispersed over the geographic space of Sudan's and the World's map. There was an ordinal sequential geographic setting which eventually sat- in around the Military Headquarters in Khartoum. It formed the accumulation of geographic waves of all protesters who gathered from all cities; towns, villages, residential areas of Khartoum, and some Sudanese in the Diaspora. It became the central geographic point of the expressions of December 2018 revolution and a nodal point of geographic concentration of human masses who adequately worked to throw down the Ingaz Government. From local to international levels, the December 2018 revolution became one of the Arab's spring revolutions.

Geographic decay of December 2018 revolution

Sit-in breaks up took place in 6th April 2019 by military forces where many Sudanese were killed, injured, tortured or drowned into the Niles. The breaks up of sit-in has resulted into a **new geography** of December 2018 revolutionary and transferred it into a new phase of **geographic domain**. The forms of revolutionary expressions were restricted to civil protests accompanied by construct of barricades and confrontations with Police forces. Also, there was the influence of the Neighborhood Resistance Committees (NRC) whose role during and after the revolution has been significant (Bach, 2021). Moreover, social media blackout has crippled activists' use of technology (Daffalla, et al., 2021). The new **geographic domain** of December 2018 revolution was specifically confined to some old residential areas in Khartoum's three towns (Figure 4). This might indicate to the **geographic**

decay of this revolution to **locality level** and then further to **sub-locality level** as manifested by these old residential areas. Here, revolutionary expressions were mainly concentrated in and around inter-city focal points such as nodal-transportation points, central market areas, and main crossing roads and in short time intervals.

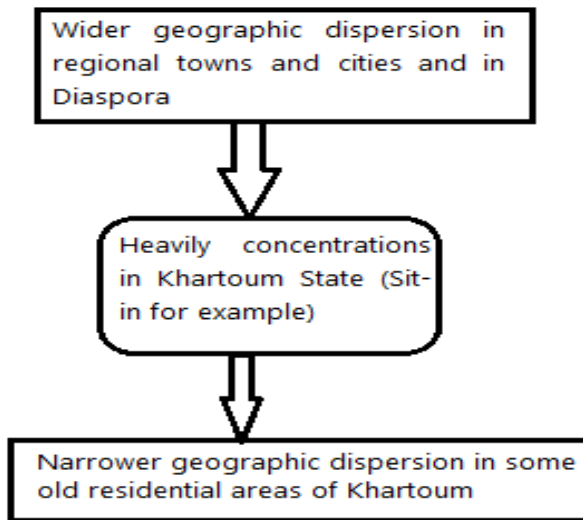


Figure 4: Geographic decay of December 2018 revolution in Sudan

This second phase of decay of December 2018 revolution is characterized by the transmission of revolution expressions as being geographically contagious as expressed by old residential areas in the three towns of Khartoum State which are geographically neighbored. It is also noticeable that, the December 2018 revolution has passed from a wide geographic dispersion all over the Sudan, to heavily concentration in Khartoum State and eventually to a narrow geographic dispersion in some old residential areas in Khartoum towns (Figure 4).

There was a significant role of roads in wide spreading

and contagion of diffusion and diffusion of information and revolutionary expressions as they cross the heart of each of the three towns and particularly old residential areas. They worked for and as networks and channels to link residential areas in the various stages of pre and after sit-in breaks up. The main roads in the three towns of Khartoum those were mostly influential as channels for the diffusion of revolutionary expressions were el-Arba'ien, el-Mouradh, el-Kadarou, el-Ma'aradh, el-Doma, and el-Higra. They cross old residential areas in the three towns of Khartoum State which took the flag of revolutionary expressions. In Khartoum towns the most famous ones were Burri, El- Duoom, El- Sahafa, Gerief West and El- Shagara. In Omdurman town they were Banat; El-Moradah; El- Abbasya, Abu-Roaf and Wd-Nubawi. In Khartoum North they were Shambat, Duoom Bahri, El- Gerief East and El- Shaa'bia (figure 5).

The old residential areas of Banat; El-Muradah and Abbasya and similarly Burri and Gerief West lay very close to each others. Gerief East is also very close to Burri via Munshia Bridge. They share the location privilege to lie at the entrance to Omdurman town via Khartoum, Khartoum North via Omdurman, and Khartoum towns via Khartoum North. It is noticeable that, these old residential areas lay close to the Blue and River Niles and are directly linked via bridges which have accepted them the privileges of being areas of mutual reception of exchanged pulses of revolutionary activism.

The bulkiness of revolutionary expressions took place in Omdurman's old residential areas which are closely neighbored and whose populations are originally descendants of migrants who supported the Mahadism revolution. The residential areas of Burri, Shambat, Gerief West and Gerief East are originally inhabited by descendants of old Nubians who settled there for centuries. Nubians are famous of being “ People of Governance and Sovereignty”

Thus, the joint revolutionary heritage of Mahadism in Omdurman with inherited culture of old Nubians in Burri and Shambat in Khartoum and Khartoum North have kept the continuation of December 2018 revolution besides, its specific confinement to these old residential areas. It is also important to consider the movement of some residents of these old residential areas in Omdurman to reside in some residential areas in Khartoum North town and who might have relations with their relatives in Diaspora. These might have influenced the continuation of revolutionary expressions during this phase of geographic decay.

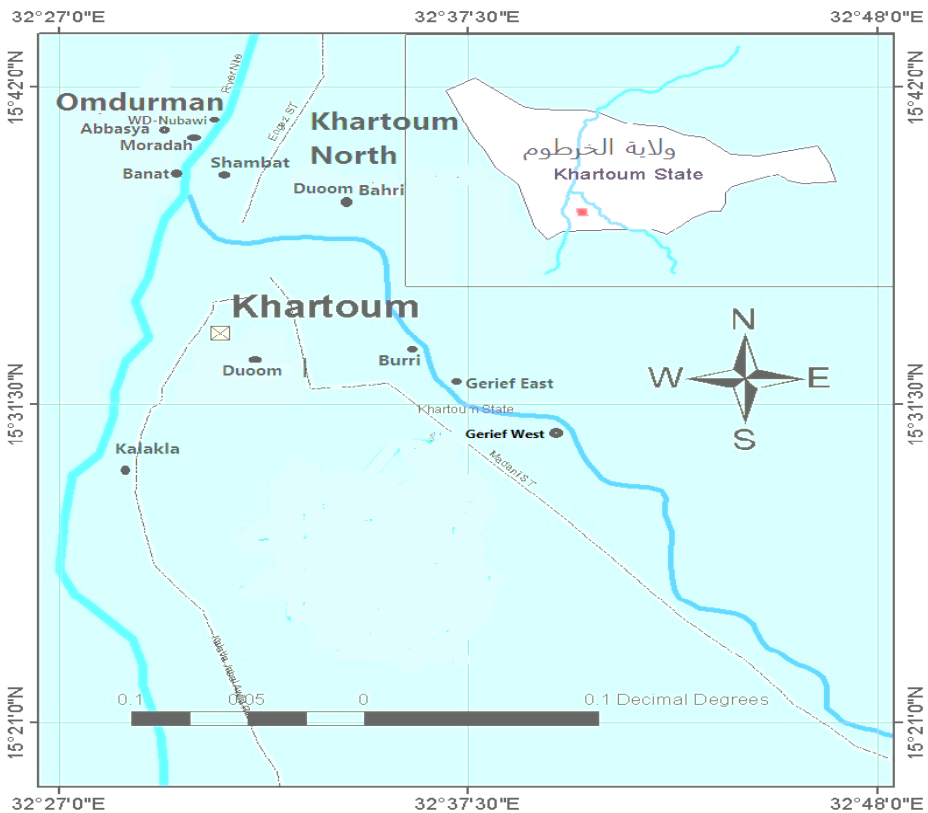


Figure 5: Locations of old residential areas as geographic nodes of concentration of revolutionary expressions

This geographic decay to these old residential areas confirms the following geographic manifestations:

- 1- Trans-location to **sub-locality levels** as manifested by confinement of revolutionary expressions to some old residential areas in the three towns of Khartoum State (**geographic limitation**).
- 2- Geographic contagion of transmissions of revolution expressions due to neighborhood of old residential areas (**geographic tangency**)
- 3- Roads enhancement of contagion of diffusion and diffusion of information and revolutionary expressions as they cross the heart old residential areas (**Enhancement by Human constructs**).
- 4- Geographic location of old residential areas at the main entrances and linkages via bridges and lay close to the Blue and River Niles (**location privileges**).
- 5- There is the influence of joint revolutionary heritage of Mahadism and culture of old Nubians (**society politicalization**).
- 6- The influence of Sudanese in Diaspora as they might have relations with their relatives in these old residential areas (**transboundary linkages**).

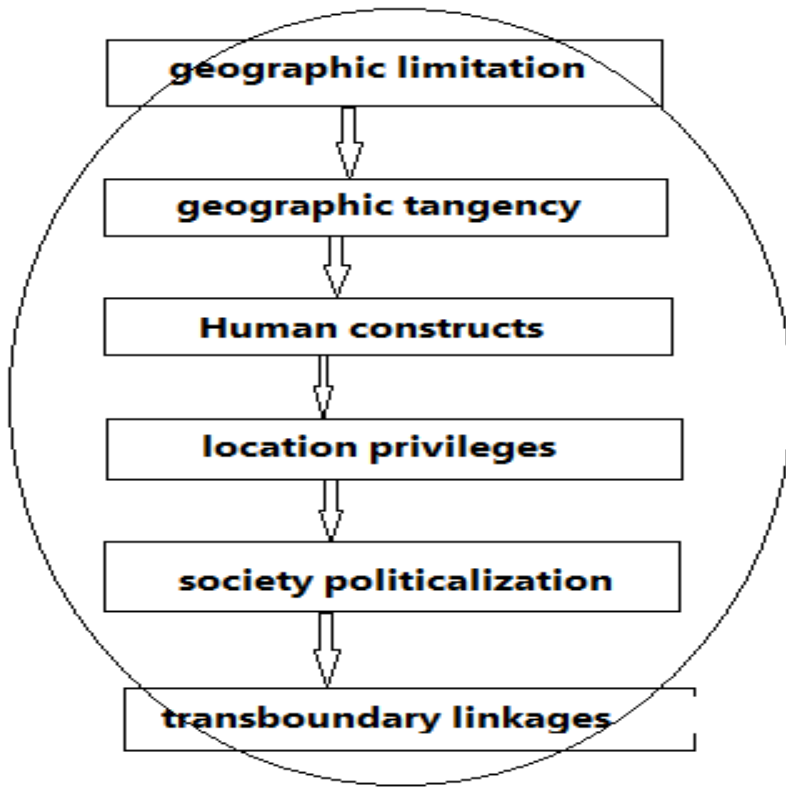


Figure 6: Manifestations of geographic decay of 2018 revolution by old residential areas

Discussion

The earlier outbreak of December 2018 revolution in the towns of Damazin and Atbara and later in other towns of the Sudan could be justified for socioeconomic inequality and justices that can generate social uprisings. People who protested in Sudan might have worked to redress injustices. This could be true when they believe that such protests have a chance of producing a favorable resolution of their grievances (Chen et al., 2021). However, Awad

(2022) had challenged normative frameworks on the necessity of violence for social movements to succeed. Protests of Sudan might shed light on different types of democracy that exist in the region generally and on what type of democracy is missing (Yi, 2015). And since earlier research has linked economic shocks to conflict outbreak (Wischnath et al., 2014) and social uprisings, where regions with strong socioeconomic inequalities are significantly more exposed to such events in Sub-Saharan Africa (Fjelde et al. 2014) including Sudan. This could be due to the “exclusionary legitimacy of the African state and elite incentives to engage in competitive mobilization of communal groups and precipitate violent communal conflict” (Fjelde et al. 2014). This revolution has moved from the wars that stained Sudan peripheries towards the centre of the country, and in particular to its capital Khartoum. As a result, the transition ran the risk of reproducing the dichotomy between centre and peripheries that was itself the principal reason behind the political and economic crises at the origin of the uprising (Tubiana, 2022). The generation change was evidently witnessed in Sudan’s massive protests who might be general education students or university students/graduates which are similar to massive student protests world widely. This made some researcher to raise the questions: are we witnessing a generational change? Or are they a sign of a broader global shift towards “assertive citizenship” present in advanced democracies and democratizing countries? (Kusa, 2018). Therefore, it might be possible to arrange the December 2018 revolution in Sudan within the tensions that came together to form a localized geopolitics (Foxall, 2010). These protests have been named as “revolutions” by peoples while the Western cultural political discourse has named them “Trans” (Abdelhady et al., 2021).

Protests in Sudan since December 2018 could be similar to riots erupted in Kibera in Kenya immediately after the announcement of

2007 election results, where the country erupted in protest. It could also be similar to politically motivated violence in South Asia which are associated with different forms of governance and relationships between society and the state. It could further be positioned within the classification of conflict events In India in 2015 and 2016 into conceptual categories of sovereignty - neutral and sovereignty - challenging, theoretically reflecting the commonsense distinction between riots and rebellion (Naseemullah, 2018). They have taken intervals over space similar to a space-time analysis in North Caucasus of Russia in August 1999 to July 2010 which shows that violence is concentrated in short time intervals and geographic distance (O'Loughlin et al., 2012). Therefore, protests in Sudan is one of mass protests that have increased annually by an average of 11.5 percent from 2009 to 2019 across all regions of the world, with the largest concentration of activity in the Middle East and North Africa and the fastest rate of growth in Sub-Saharan Africa (Brannen et al., 2020).

The riots occurred in December 2018 revolution is not independent events, and the cities not only have differential inherent propensities to riot but, also different levels of responsiveness and resistance to diffusion of riots. Mass media was very influential and particularly when implied networks related to mass media distribution provide the pathway along which riot diffusion is transmitted (Myers, 2000). The media ecology approach provides a more comprehensive understanding of the interplay and intertwinement of human actors in social revolution, collective agency, and technologies than the one-medium based approach used previously on social movements, particularly in the Arab world (Malik, 2022). These could conceptualize riots in Sudan as a series of interdependent events which diffuse in different patterns depending on the characteristics of the riot and the city in which it occurs. They might further emphasize the paramount importance

of the mass media in creating and sustaining collective and protest waves (Myers, 2000). This is important since the observed and assessed political and mass-mediated discourses have respectively developed their own frames (Braeuer, 2017). Social media can play an important role in protests beyond simply a way in which citizens can coordinate their actions and users of tweeting the protestors are geographically distant from street protests and that users from geographically isolated areas rely on Twitter hashtag (Battaglini et al., 2020). It is evidently known that, kinship is the strongest channel of reinforcement and diffusion as well as geographical proximity in transmitting simple effects on perceptions, and that chatting conveys more complex effects on behavior as was evident in the Nigerian election in 2007 (Fafchamps, 2013).

The emergence and influence of “Rndok”, the secret jargon was used by Sudanese Professional Association (SPA) – the political body that led this uprising – to address the local Sudanese youth and the socially marginalized population throughout the revolution from January – to August 2019 (Mustafa, 2020). Randok had a significant influence on the overall mode and spirit of this youth-led revolution, whether in mobilizing the masses or in shifting the styles of chants and slogans, besides impacting the discourse of the uprising (Abdulmajed, et al. 2020). Distance decay is an important geographic property of online social networks during this revolution in Sudan. This important since social interactions are more likely to occur among people who are closer in physical space and similar places tend to have “relatively higher communication intensity than dissimilar ones, confirming a significant homophily effect as a determinant of communication intensity” (Xu et al. 2022). As was happened in December 2018 revolution, information sharing within social groups can facilitate information aggregation when the social groups are sufficiently large even when it is not predicted with individual signals (Battaglini et al., 2020).

High urban population growth may increase chance of social unrest in urban outskirts (Gizelis et al. 2021), particularly among the urban poor who have been impoverished by ineffective economic policies developed abroad as well as at national level (Elhadary et al. 2012). Urbanization has long been seen by scholars and policymakers as a disruptive process that can contribute to social and political unrest. Over-urbanization can increase the risk of civil unrest. Urban population size and the number of large cities in a country are both positively and significantly associated protest incidence. A country's level of urbanization is negatively associated with protest incidence and rejects the over-urbanization hypothesis: higher levels of urbanization are associated with less frequent protests at all income levels (Fox et al., 2016). The population that lives in African cities is expected to increase by more than 150% between 2020 and 2050 according to UN population forecasts, massively outpacing rural population growth estimated at 35% (Gizelis et al. 2021). Sudan has two cities with more than a million people, nineteen cities between 100,000 and one million, and forty two cities between 10,000 and 100,000 (World Population Review, 2022). Over the last twenty years, Khartoum has been as explosion of rural mass exodus to the urban centers which has brought about social change and created a melting spot of identities once separated by tribe, language, and distance. These could bring explanations for the exclusiveness of revolutionary expressions following sit-in breaks up to Khartoum State generally and to some old residential areas specifically which is important to admit as being a geographic decay which has tainted the December 2018 revolution in Sudan. The aged urbanization and the political history of these old residential areas may help to explain the confinement of revolutionary expressions there.

The beginning of old residential areas in Omdurman town was associated with Mahadism Revolution which came to fall down

the Turkish rule in Sudan in 1885. The leader of the revolution established his rule in Omdurman as the capital of the newborn Islamic State. Residential areas were named after some military leaders of Mahadism revolution such as WD-Nubawi for example. The inhabitants of these residential areas were families of the warriors who accepted their sons and further their descendants the soul of revolutionary work. Many became famous politicians; members of political parties; and top civil-work employees. They have experienced all popular uprisings in Khartoum either by direct participation or supporting. The soul of the revolution and the experience of some past serious events such as the destruction of Imam Ebdel-Rhman El-Mahdi mosque and the massacre of Wd-Nubawi in 1971 where many followers of Mahadism were killed, are heritages for revolutionary work. These old residential areas in Omdurman town were also inhabited by many famous families involved in politics; Arts, sports; education, and commerce. Besides that, the founding of National Movement for Independence in Sudan against the British Authority and the formation of political parties was in old Omdurman town. The other old residential areas in towns of Khartoum and Khartoum North share many of the political history with Omdurman's old residential areas. The old residential areas of Burri and Gerief West in Khartoum town, and Shambat, and Gerief East in Khartoum North are originally inhabited by descendants of old Nubians who settled there for centuries. Nubians are famous of being "People of Governance and Sovereignty".

The joint revolutionary history of Mahadism and National Resistance Movement in Omdurman and the culture of old Nubians in Khartoum and Khartoum North towns might have significantly enhanced December 2018 revolution. Also, new residential areas in Khartoum State have accepted many of the residents of old residential areas who have brought some of

that revolutionary past. Many of them have affiliated to some progressive political parties such as the Sudanese Party and the Communist Party. Anti colonization movement and anti military governments were initially elite- led. It was associated with the intellectuals who graduated from Gordon Memorial College and later from Khartoum University. They were mostly lived in old Omdurman and modern Khartoum town where the thinking about a modern and independent State in Sudan was strongly linked with them. So, the inherited political culture might have transferred throughout the descendants' generations to upraise in December 2018 revolution, and similarly in the former 1964, 1985, and 2013 uprisings. In addition, there might be a sort of connections with their relatives living in Diaspora that could initiate an influence on the continuation of the revolution following sit-in breaks up in April 2019.

The role of roads in the diffusion of December revolution was very prominent since diffusion was a critical force behind the pattern of rioting in Sudan's revolution. It is known that, roads shape the costs and sustaining and expanding operation, which facilitate the transmission of rebel and violent behavior to new locations. The use of road network distances can yield more conservative inferences and more accurate predictions of how rebel and violent behavior spreads. Physical connections between municipalities may help explain the expansionary and self-limiting dynamics of rebel and violent behavior; one may ask whether (and how) information on the structure of road network changes the inferences.

Police forces, being representative of the state, have the monopoly on violence in society, but also need to legitimize their use of force. During December revolution of 2018 there was a noticed excessive use of force against protestors. It is somehow similar to what has happened in Catalonia, Spain where police

forces have dehumanized protesting citizens to a considerable degree. “Animalistic dehumanization was especially relevant since it was associated with legitimation of violence, hostility felt toward the protesters, and also with the degree of self-humanization of policemen as unfeeling machines as was associated with meta-dehumanization” (Ziobina et al., 2021). Repression simultaneously deters and inspires protests and there is a dynamic relationship between repression and rebel (Bjonnes, 2021) where Sudan shows a delayed increase of protests after repression of previous protests (Bjonnes, 2021).

The youth- led popular protest of April 2019 was marked by unprecedented ethnic, class, and gender diversity that differentiated it from the elite- led, middle-class revolutions of the past (Ibrahim, 2019). Racial concepts such as Blackness are certainly porous and expand to transfer ever-more marginalized communities into conditions of captivity and depravation (Mondesire, 2021). There were some noticed ethnic riots during the December 2018 revolution exhibited by some dominantly ethnic residential structures in some peripheral areas in Khartoum State. They might not alienate from the general socioeconomic inequality that can generate intergroup grievance. They could be similar to others accompanied ethnic violence in some other countries such as Germany during 1990-1995, where structural factors related to ethnic approach, social disintegration, and political opportunity structures made certain localities more prone to exhibit ethnic violence “with diffusion variables that approach the degree to which ethnic violence diffuses across time and across localities” (Braun et al., 2010). They were further complicated with emergence of new armed forces, militias and armed groups. They have called the hegemony of the centre over the security forces into question (Tubiana, 2022). The problematic of race generally, and the questions of Africaness and blackness in particular, are difficult to determine in contexts without reference to Blacken the marginalized and displaced (Awad, 2022).

Conclusions and recommendations

The main results of this research could be summarized as follows:

1. The start of huge revolutions is not conditionally associated with large urban centers, however small and low ranked town of Damazian was the prime geographic point of December 2018 revolution in Sudan.
2. The geographic diffusions of December 2018 revolution were unevenly and discretely dispersed over the geographic space of Sudan's and the world's map.
3. The geographic decay of December 2018 revolution has followed sit-in breaks up in 3rd of June 2019 which essentially diminished the revolution to almost Khartoum State.
4. Geographic decay of December 2018 revolution was eventually diminished to narrower geographic dispersions in some old residential areas in Khartoum three towns.
5. These old residential areas have exhibited the character of geographic limitation, geographic tangency, and enhancement by human constructs, location privileges, and transboundary linkages of this revolution.
6. There were some ethnic riots accompanied with December 2018 revolution and were more emphasized by some peripheral areas in Khartoum State.

The geography of December 2018 needs to be more assessed particularly its patterns of diffusion and decay, as was tried by this research. This is important for scrutiny of political and socioeconomic conditions of Sudanese communities. This might contribute in future planning to overcome social unrests which impose further burdens over the shoulder of the poor people of Sudan. Economic shocks were linked to conflict outbreak (Wischnath et al., 2014) and political crisis, protests and uprisings have a significant and negative impact on economic growth. For economic growth, "the deviation of the actual series from the counterfactual is negative, immediate, persistent and highly significant; indicating non-negligible costs of the shock" (Diop et al. 2022).

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