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Cover Picture: A view of the de la Plata River, from Colonia del Sacramento, Uruguay, 23 March 2019.

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Vol. 8, N° 2

Student Prize Series

WATERLAT-GOBACIT Student Prize 2019-2020
with experiences from Argentina, Brazil, Mexico, Sierra Leone, and Spain.

Antonio Rodríguez Sánchez (Ed.)
Newcastle upon Tyne and Zacatecas, June 2021



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Cuadernos de Trabajo de la Red WATERLAT-GOBACIT

Vol. 8, N° 2

Serie Premio de Estudiantes

WATERLAT-GOBACIT Premio de Estudiantes 2019-2020

con experiencias de Argentina, Brasil, España, México y Sierra Leona

Antonio Rodríguez Sánchez (Ed.)
Newcastle upon Tyne y Zacatecas, México, junio de 2021



Student Prize Series

WATERLAT-GOBACIT
Student Prize 2019-2020

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Serie Premio de Estudiantes

Premio de Estudiantes
WATERLAT-GOBACIT 2019-2020

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Presentation of the Student Prize Series and the issue

This issue of the WATERLAT-GOBACIT Network Working Papers is a product of the 2019-2020 editions of the Network's [Student Prize Competition](#), granted to master and doctoral thesis submitted by students who are members of the Network. This is the fifth issue of the Student Prize Series, and features eight articles based on doctoral and master dissertations on Agrarian Social Studies, Anthropology, Applied Ecology, Development Studies, Geography, Public Health, and Sociology, successfully defended in universities from Argentina, Brazil, Mexico, Spain, and the United Kingdom. The papers reflect the work done by the students in our [Thematic Areas](#), in this case contributing particularly to [TA2, Water and Megaprojects](#) (Article 3), [TA3, Urban Water Cycle and Essential Public Services](#), [TA5 Water and Health](#), [TA6, Hydrosocial Basins, Territories, and Spaces](#), [TA8 Water-related Disasters](#), and [TA9 Water and Production](#).

Antonio Rodriguez Sanchez, from the Autonomous University of Zacatecas, Mexico, is the Co-ordinator of the Series and the editor of this issue. We are delighted to present the work of our students to the readers, and wish you a fruitful experience.

Jose Esteban Castro

General Editor

Newcastle upon Tyne and Buenos Aires, June 2021

Presentación de la Serie Premio para Estudiantes y del número

Este número de los Cuadernos de Trabajo de la Red WATERLAT-GOBACIT es producto de las ediciones 2019-2020 del Concurso [Premio para Estudiantes](#), otorgado anualmente a tesis de maestría y doctorado de estudiantes miembros de la Red. Este es el quinto número de la Serie Premio para Estudiantes e incluye ocho artículos basados en tesis de doctorado y maestría en Antropología, Ecología Aplicada, Estudios sobre el Desarrollo, Estudios Sociales Agrarios, Geografía, Políticas Públicas, Salud Pública y Sociología, que fueron defendidas exitosamente en universidades de Argentina, Brasil España, México y Reino Unido. Los trabajos incluidos reflejan la labor realizada por nuestros estudiantes en nuestras [Áreas Temáticas](#), en este caso contribuyendo particularmente al [AT2, Agua y Megaproyectos](#), [AT3, Ciclo Urbano del Agua y Servicios Públicos Esenciales](#) [AT5, Agua y Salud](#), [AT6, Cuencas, Territorios y Espacios Hidrosociales](#), [AT8 Desastres Relacionados con el Agua](#) y [AT9 Agua y Producción](#).

Antonio Rodríguez Sánchez, de la Universidad Autónoma de Zacatecas, México, es el Coordinador de la Serie y editor del número. Con placer les presentamos el trabajo de nuestras y nuestros estudiantes y les deseamos una experiencia fructífera.

José Esteban Castro

Editor General

Newcastle upon Tyne y Buenos Aires, junio de 2021

Introducción

El presente número de la Serie Premio para Estudiantes incluye ocho artículos, tres de ellos correspondientes a la Edición 2019 del Premio y los otros cinco son producto de la Edición 2020. Los textos sintetizan los aspectos principales de las tesis de maestría y doctorado de los autores y autoras. Se trata de aportaciones de carácter teórico, metodológico y análisis fundados en trabajos empíricos que examinan diversas problemáticas sociales relacionadas con el tema del agua en África, América Latina y Europa.

Trabajos correspondientes a la Edición 2019 del Premio

La serie de artículos inicia con los tres trabajos correspondientes a la Edición 2019.

El Artículo 1, a cargo de Robin Larsimont, se basa en su tesis de doctorado, que realizó en la Universidad de Buenos Aires (UBA), Argentina, y analiza la dinámica territorial vinculada con el proceso de expansión de la frontera agrícola en los oasis de la Provincia de Mendoza, Argentina. El autor aborda el tema desde la perspectiva de la Ecología Política del Agua enfatizando la emergencia de una “nueva ruralidad” y propone el concepto de “ruralidad hidrosocial”, que busca capturar el carácter pluridimensional y transescalar del proceso. Larsimont argumenta que, en Mendoza, la circulación de agua se constituyó como eje vertebrador y pilar en torno al cual se han producido históricamente los espacios rurales de los oasis característicos en esta provincia, incluyendo la nueva “ruralidad hidrosocial” identificada en el estudio. El autor destaca que su propuesta conceptual ayuda a entender el carácter histórico de las transformaciones rurales, la lógica actual del sistema agroalimentario, su conexión con la circulación del agua, las interacciones entre lo local, lo global, lo humano, lo no-humano y lo híbrido.

El Artículo 2, a cargo de Daniel Moreno Muñoz, que se basa en la tesis de doctorado del autor, realizada en la Universidad de Murcia, España, presenta un análisis sobre el cambio que se ha producido en las últimas décadas en el sector pesquero, como resultado de las innovaciones tecnológicas. El trabajo toma como ejemplo empírico el caso de la Bahía de Mazarrón en la Región de Murcia, en la cual existe una crisis en todos los puertos pesqueros regionales. El objetivo principal del trabajo es analizar cómo ha evolucionado el modo de vida de los pescadores, el impacto de dichos cambios en la actividad pesquera en Mazarrón en la Región de Murcia y examinar las posibilidades de implantar alternativas como el turismo pesquero.

El Artículo 3, de Rafael Caldeira Magalhães, basado en la tesis de doctorado del autor realizada en la Universidade Federal de Minas Gerais (UFMG), Belo Horizonte, Brasil, tiene como objetivo examinar la participación social en la elaboración, implementación

y evaluación de tres planes de servicios públicos de agua y saneamiento, durante el período de 1980 a 2015, en el municipio de Belém, Estado de Pará, Brasil. Entre los temas destacados en su análisis, el artículo aborda aspectos de racionalidad, y cambios institucionales, intersectorialidad y participación social. El autor nos explica el contenido de las narrativas de los actores sociales, relacionadas con su intervención en los planes de agua y saneamiento en Belém. Entre las principales conclusiones se indica que de en el período de estudio hubo pocos avances en la participación social en el tema, y que los actores tecnocientíficos han dominado los espacios que deberían promover la comunicación entre diferentes intereses y la participación en las políticas públicas de agua y saneamiento. De este modo, el artículo resalta cómo el predominio de la racionalidad instrumental normativa característica de la tecnociencia, contribuye a perpetuar el proceso de exclusión, por ejemplo, dando prioridad a políticas de mercantilización de dichos servicios esenciales en lugar de centrar la atención en extender los servicios a la población no atendida. Lamentablemente, el fracaso de los órganos colegiados de planificación y políticas públicas de abastecimiento de agua y saneamiento en la ciudad impidió que los planes estudiados logran profundizar los procesos de democratización en este sector.

Trabajos correspondientes a la Edición 2020 del Premio

Los cinco artículos que complementan este número corresponden a la Edición 2020 del Premio para Estudiantes.

El Artículo 4, de Aline Silveira Viana basado en la tesis de doctorado de la autora, realizada en la Fundación Oswaldo Cruz (FIOCRUZ), Río de Janeiro, Brasil, tiene como objetivo comprender los impactos de una serie de desastres hídricos que afectaron la región serrana del Estado de Río de Janeiro, Brasil en décadas recientes sobre la salud mental de las personas ancianas. La autora indica que en Brasil existen pocos estudios sobre este tema y que además se carece de servicios públicos de atención psicosocial de largo plazo para estos sectores. Una conclusión del trabajo es que el estudio de y la intervención pública para afrontar los desastres no deben seguir considerando solamente la dimensión física de los mismos –sean de naturaleza hídrica, meteorológica, geológica, química o de otro tipo–, dejando de lado el factor humano, las vulnerabilidades y las desigualdades presentes en el tejido social, ya que las políticas de prevención y mitigación son la clave para la reducción del impacto de los desastres, así como, para desarrollar estrategias de protección y cuidado de la salud mental de las personas ancianas en estos contextos.

El Artículo 5, a cargo de Clarissa de Araújo Barreto, basado en la tesis de doctorado de la autora, realizada en la Universidad de San Pablo (USP), San Pablo, Brasil), discute la construcción de representaciones sociales sobre la relación entre el monocultivo de eucaliptus y el agua en los territorios rurales del Valle del Río Paraíba, Estado de San Pablo, Brasil. La autora destaca la existencia de representaciones divergentes sobre dicha relación, en las que, por un lado, se identifica una posición según la cual las

plantaciones de eucalipto perjudican la disponibilidad de agua en la región, mientras que otras concepciones son contrarias a dicha comprensión de las plantaciones de eucaliptus como negativas para la disponibilidad hídrica y reflejan una diversidad de saberes y representaciones sociales sobre el tema, mostrando que los saberes locales pueden contribuir a una mejor comprensión de las dinámicas territoriales que tienen lugar en contextos de escasez de agua y vulnerabilidad social.

El Artículo 6, a cargo de Diego Antonio Cabrol, se basa en la tesis doctoral del autor, realizada en la Universidad Nacional de Córdoba (UNC), Córdoba, Argentina. El trabajo discute los cambios experimentados en el acceso al agua por parte de distintos actores sociales en el oeste de la Provincia de Córdoba, Argentina, y cómo dichos cambios se relacionan con las relaciones de poder y los conflictos sociales resultantes. El autor argumenta que las transformaciones productivas ocurridas en la zona de estudio, generan cambios y disputas por las condiciones de acceso al agua por parte de los distintos actores sociales, un proceso dinamizado por la llegada a la región de nuevos productores rurales a gran escala, con estrategias de producción que implicaron aumentos significativos en la demanda de agua, lo cual originó nuevas formas de acaparamiento del agua y de exclusión en su acceso.

Erick Alejandro Rafael Aguilar Obregón, quien realizó su tesis doctoral en la Facultad Latinoamericana de Ciencias Sociales (FLACSO), Ciudad de México, es el autor del Artículo 7, que discute los conflictos generados por el proyecto de recuperación socioambiental de un río urbano, el Canal Nacional, impulsado por el gobierno de la Ciudad de México en el año 2019. El autor destaca lo que considera una inesperada oposición, por parte de algunos sectores ciudadanos, a las obras de recuperación. El artículo considera la participación de distintos actores sociales que han tenido incidencia sobre este proceso durante la historia reciente del Canal Nacional y discute algunas contradicciones y conflictos surgidos entre las autoridades y las organizaciones sociales con respecto a las obras de mejora ambiental propuestas y llevadas a cabo por el Gobierno de la Ciudad de México, cerrando el trabajo con sugerencias para abordar más efectivamente los conflictos que suelen caracterizar a este tipo de intervenciones de política socioambiental urbana.

Finalmente, Julián Reingold es autor del Artículo 8, basado en su tesis de maestría, realizada en University College London (UCL), Londres, Reino Unido. El trabajo discute los arreglos de gobernanza para la Reducción del Riesgo de Desastres que tienen como actores centrales a organizaciones dirigidas por colectivos de pobres urbanos basados en sistemas de relaciones y normas consuetudinarias en las áreas costeras de la ciudad de Freetown, capital de Sierra Leona, África, un área afectada por la degradación de manglares y humedales, lo que ha provocado una disminución de la ciudad contra las inundaciones estacionales que afectan regularmente a diferentes partes de la costa.

De este modo, presentamos a las y los lectores una selección de trabajos caracterizada por una diversidad de enfoques y experiencias empíricas procedentes de África, América Latina y Europa, que abordan importantes aspectos de la política y la gestión del agua en perspectiva inter y transdisciplinaria.

Les deseamos una fructífera lectura.

Antonio Rodríguez Sánchez

Coordinador de la Serie Premio para Estudiantes

Unidad Académica de Ciencias Sociales, Universidad Autónoma de Zacatecas,
Zacatecas, México

junio de 2021

Artículo 8

Transforming Freetown: Coastal Resilience and Community-Ecosystem Based Practices¹

*Julian Reingold*², Independent Researcher, Athens, Greece, and Buenos Aires, Argentina

Resumen

Las áreas costeras más amplias de Freetown en Sierra Leona están sufriendo la degradación de los manglares, y la tala de árboles alrededor de la capital ha reducido en gran medida la capacidad de estos humedales para proteger secciones de la ciudad de las inundaciones estacionales, que afectan regularmente a diferentes partes de la costa, causando una pérdida de medios de vida y destrucción de la propiedad. La costa puede verse como la frontera dinámica de la ciudad, principalmente a través de la expansión de asentamientos humanos debido a la falta de viviendas en otras áreas formales, lo que resulta en la práctica de reclamación de tierras conocida localmente como 'banking', sin un reconocimiento de la importancia de los servicios ecológicos que brindan los manglares ubicados en los humedales. Al buscar experiencias colectivas en términos de exposición al riesgo y prácticas de búsqueda de resiliencia, el foco del presente manuscrito es la relevancia sociológica que se les da a los habitantes de estas áreas propensas al riesgo a través de los planes de conservación y urbanización de Freetown y a través de la comprensión de sus vulnerabilidades debidas a la falta de planificación formal y la relación de sus medios de vida con los servicios ecosistémicos que brindan los manglares en los humedales.

Palabras-clave: Manglares; Servicios ecosistémicos; Resiliencia; Urbanización; Desarrollo costero.

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Abstract

The wider coastal areas of Freetown in Sierra Leone are suffering mangrove degradation,

¹ This article is based on the author's MSc dissertation "Transforming Freetown: Coastal Resilience and Community-Ecosystem Based Practices", The Bartlett Development Planning Unit University College London, 2019.

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and clearance around the capital has greatly reduced the ability of these wetlands to protect sections of the city from seasonal flooding, which regularly affects different parts of the coast, causing a loss of livelihoods and destruction of property. The coast can be seen as the dynamic frontier of the city, mainly through human settlement expansion due to lack of housing in other formal areas, resulting in the land reclamation practice known as 'banking', without an acknowledgement of the importance of the socio-ecological services provided by the mangroves located in the wetlands. By investigating collective experiences in terms of risk exposure and resilience-seeking practices, the scope of this manuscript is on the sociological relevance that the inhabitants of these risk-prone areas are given across the conservation and urbanization plans for Freetown and through an understanding of their vulnerabilities due to lack of formal planning and the relation of their livelihoods with the ecosystem services provided by the mangroves on the wetlands.

Keywords: Mangrove forests; Ecosystem services; Resilience; Urbanisation; Coastal development.

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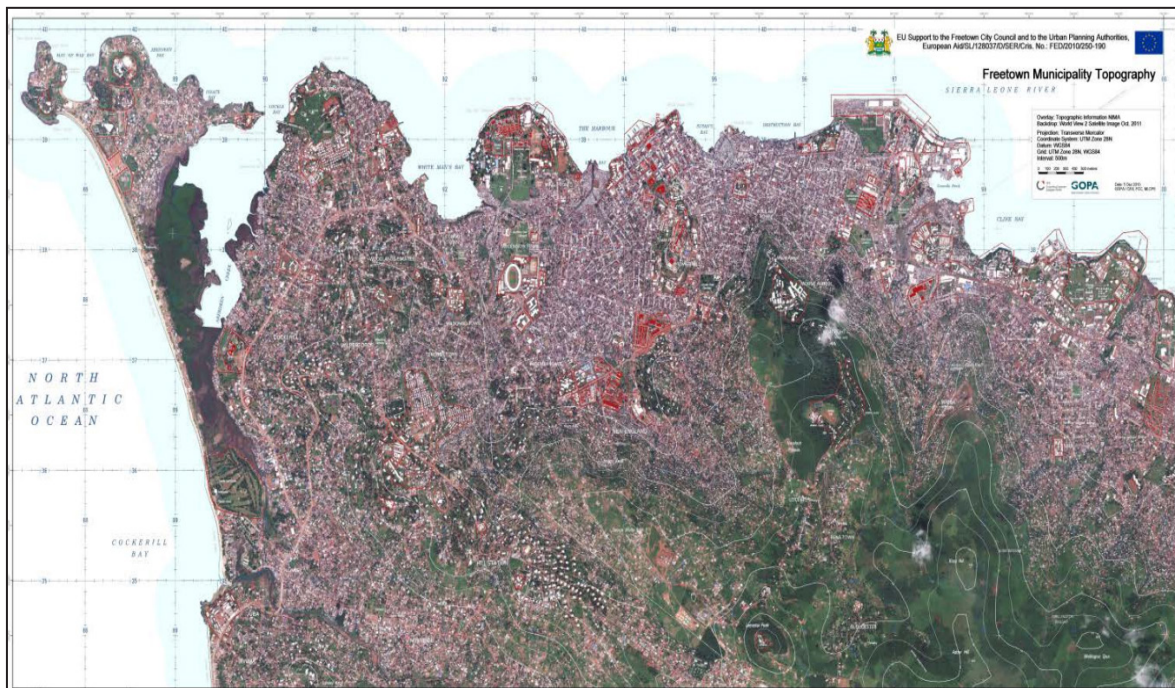
Introduction

The coastal Guinean mangroves is one of Sierra Leone's four distinct geographical regions, and it is highlighted as one of the ecosystems that will suffer significantly with rising sea levels in the 'Impact of Climate Change on Coastal Habitats and Biodiversity' within the National Adaptation Programme of Action (NAPA). Therefore, understanding the converging, multi-dimensional hazards of seasonal coastal floods affecting Freetown related to the health of the wetlands should be a concern for the international community. As climate change will unavoidably have impacts on urban systems and populations, especially in the Global South, where many large cities are exposed, attention is drawn to the case of Freetown (Map N° 1). In this city, depletion of the Sierra Leone River Estuary (SLRE) natural environment is occurring, specifically the mangrove forest, which if healthy, has the capability to cope with sea-level rise and reduce coastal flooding. A shared characteristic of the city's informal coastal settlements is that their residents engage in a particular type of land reclamation known as 'banking'. While this process creates a means to own a piece of land in risk-prone areas of the city, they contribute to risk accumulation vulnerable built environment (see Urban Ark housing vulnerability classifications in the Appendix), and exposes their inhabitants to both everyday risks such as water and sanitation-related diseases and extensive risks such as flooding.

The varying vulnerabilities between the settlements can be understood by using timelines showing how the land banking expansion process has evolved through time, leading to a zero-growth banking pact established in late 2018. This pact, known as the 'Memorandum of Understanding' (MoU), between coastal communities and the National Protection Agency (NPAA) seems to open new pathways for a community-led approach to tackle these problems across the informal settlements along the coast. This will require linking local practices and community bylaws with governmental bodies to articulate socio-environmental objectives and stopping risk-traps on the coastline. Such juncture may call for an approach of community-ecosystem based adaptation as a solution to the social crisis along the coast as there is a need to preserve and restore the local mangrove ecosystem to counter the risk accumulation cycle but also to assure the survival of livelihoods depending on the biodiversity due to the wetlands. Risk in this sense spans both extensive and intensive risks: 'extensive risks' including everyday hazards such as infectious disease, and small disasters such as localized floods and fire outbreaks; while 'intensive risks' encompassing larger, less frequent disaster events such as tropical storms and earthquakes - according to the distinction³ made by the United Nations International Strategy for Disaster Reduction (UNISDR).

³ UNISDR made the distinction between 'intensive disasters' (currently when 30+ persons killed and/or 600+ houses destroyed) and 'extensive disasters' (events recorded as disasters but with impacts below these two thresholds). Source: Extensive Risk Thematic Note.

Map N° 1. Topographic Map of Freetown.



Source: Topographic Map of Sierra Leone's capital city as per the Freetown Structure Plan (2014)

The research leading to this article aimed to review, within the context of the MoU, to what extent this could be achieved by enhancing Disaster-Risk Management (DRM) structures which are able to tackle the intensive and extensive risks -including the eviction threats- through strategic resilience-seeking practices in cooperation with the multiple scales of government? This paper addresses the question of how does Disaster-Risk Reduction (DRR) governance work under systems led by collectives of the urban poor and customary systems respectively, and to examine this through a theoretical framework of urban ecological resilience, which understands cities as a symbiotic human-environment system with an ability to absorb shocks, but also to learn and adapt from these while continuing to maintain its core functions (Allen *et al*, 2017). In this sense, bouncing back better can be seen as a powerful notion.

According to Allen *et al.* (2019) we must rethink the way "how the governance of urban resilience currently works and on how to enhance the capacity to act of those most vulnerable to become trapped in risk accumulation cycles to disrupt these traps strategically, inclusively and collectively". Is there a differential ability of ongoing resilience-seeking practices by community-based organisations (CBOs) in urban informal settlements to disrupt risk traps? Is the governance expanding the political space to enable abridged collective action among the different stakeholders such as the urban poor, customary authorities and local governments? The emphasis of this

research will be placed on the potential of the SLRE mangroves to contribute to urban resilience at different scales and in how its conservation could be achieved by aligning recent top-down initiatives such as the MoU and the Transform Freetown agenda with bottom-up CBOs' practices to make Freetown more inclusive, safe, resilient and sustainable: or in one word, a just city.

Theoretical Framework

The 'conflicting rationalities' Surrounding land tenure and urban planning

Post-colonial states in Sub-Saharan Africa now face the challenge of planning for rapidly growing cities with high urban poor populations. Watson (2003) analysed the case of Crossroads in Cape Town, South Africa, and found conflicting rationales by addressing the gap between the notion of "proper citizens" and "proper living environments" espoused by the municipality, and the nature of the rationale guiding the actions of certain of the other parties involved.

Planning and development programmes, such as the ones designed by Sierra Leone Environmental Protection Agency (EPA) to evict the communities located in risk-prone areas of Freetown - and relocate them in lands elsewhere in the city - have been regarded negatively by these vulnerable populations as they do not want to be relocated away from the centre of the city, where most of their petty-trading livelihoods takes place. In Freetown there is also a need to recognize social difference and multiculturalism as an essential element of urban planning, as ethnic identity is embedded within the community-based organisations (CBOs) which play a vital role for the socio-political life in the informal settlements.

Ecological Citizenship and Ecosystem Services

The Millennium Ecosystem Assessment (MEA) framed the need to protect biodiversity and the world's ecosystems in terms of ecosystem services, and Bouma *et al.* (2015) explains the MEA classification of the concept in four categories: first, ecosystems that are supporting services that are necessary for the production of all other ecosystem services; second, those that are provisioning services because of the products obtained from ecosystems"; third, those that act as regulating services as the benefits obtained are a result of the regulation of ecosystem processes", and fourth, those that represent cultural services which are the nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development and aesthetic experiences. Allen's "alternative approach" considers that

the battle for sustainability is increasingly taking place not in the city but in the "city to be" [...] the peri-urban interface, where cities'

appropriation and transformation of nature's nutrient cycle manifests more intensely (Allen, 2014: 522).

From an ecological perspective, such an interface is subjected to constant tensions between the productive economic growth generated by cities and the impact this has on decreasing natural productivity, hence playing a crucial role in regulating the environmental inputs and outputs that sustain urban regions.

In order to find an answer to the question of whether or not the peri-urban should be treated as a reservoir of environmental resources and ecosystem services to be protected for the public good, Allen believes that throughout the peri-urbanizing global south, 'desirable' urban transitions are being increasingly pursued through a dispositif of socio-environmental regulation that normalizes the production and re-production of 'differential sustainability', that functions by adjusting thresholds to meet the needs and wants of certain privileged social groups and territories at the expense of others.

She considers that we must interrogate the consequences of sustainable urban planning in its capacity to create just socio-spatial relations in and through the appropriation of peri-urban nature. The political ecology argument between the Global North and Global South, has created a division between "conservation of nature" vs "environmentalism of the poor", which results in "networked environmentalisms" converging in an attempt to regulate urban transitions.

As in Lima and Mexico City, Freetown's informal coastal settlements have emerged in wetlands which provide ecosystem services for the rest of the city, hence the importance of sustaining a Zero-Growth Pact (ZGP). However, Allen argues that the cases of Durban and Abeokuta show how Payment for Ecosystem Services (PES) can be a more effective notion to the Ecosystem Services. Allen (2014) promotes the idea of an 'ecological citizenship', in which there cannot be "regulation without consideration of environmental, social, economic and political factors that drive the peri-urbanisation of poverty and the erosion of the poor's right to the city and to nature across the global south." (*Ib.*: 534). Within this notion, PES will likely reinforce socio-environmental inequalities instead of adding an ecological rationale to the process of peri-urbanisation.

Political Ecology and Environmental Justice

In line with Robbins (2008), this paper analyses the role of the state from a political ecology perspective by seeing it as a complex and non-scalar entity. Urban political ecology (UPE) provides an "integrated and relational approach that helps untangle the interconnected economic, political, social and ecological processes that together go to form highly uneven urban landscapes" (Swyngedouw and Heynen, 2003: 914). In the case of Freetown, urban resilience is strongly linked to environmental justice (EJ) as local authorities have acknowledged the urgent need to address environmental inequality in the city, but this notion needs firstly to allow for framing and claim-making (Walker, 2012) so it could then be understood by its key problématique -the differential exposure to environmental 'bads' and access to environmental 'goods' experienced by different social groups.

As Lawhon *et al.* (2014) demonstrated by investigating UPE through African urbanism, the new form of power is diffuse, and also Willox (2018) acknowledges a "grey legality" and the intricacies of "informal-formal" power relations with regards

to protected areas (PAs) in Freetown. She concludes that the planning system of the conservation areas within Freetown “remain influenced by ideas of territorial fixity and a neo-liberal agenda for the commodification of nature” (*ib.*: 33).

Mangroves as a Resilient Natural Capital

Barbier (2014) considers that in order to view the natural environment as a special type of capital asset—a form of ‘natural wealth’—then just like any other asset or investment in the economy, it must be shown that the environment is capable of generating current and future flows of income or benefits. He argues that, in principle, the various components of natural capital can be valued just like any other asset in an economy. Initiatives such as Natural Capital Singapore seek to understand the benefits of nature within a highly dense state-city that has very limited land and hydrological resources, and in contrast to Freetown, land reclamation is a policy encouraged by the government to face the high demand for housing (Jessica *et al.*, 2018). Another similar initiative valuing the services that mangroves provide is in the Urban Mangrove Management Strategies (UMMS) in Brisbane (WWF, 2012).

As per Mclvor *et al.* (2012a):

mangroves are able to attenuate wind and swell waves and these attenuation rates suggest that [with] over 500 m of mangrove forest, wave height would be reduced by 50 to 99%: [...] To achieve the highest level of protection from wind and swell waves, a dense mangrove forest, including species with aerial roots, is recommended (*ib.*: 24).

In areas with small waves and dense mangrove forests, such as Freetown, a thin band of mangroves may provide an adequate defence. With regard to “hybrid engineering”, the use of mangroves for coastal defence in combination with other elements, Mclvor *et al.* (2012b) explain that:

seawalls and levees placed on the landward side of mangrove forests are likely to experience reduced water levels and wave energy during storm surges, greatly reducing the likelihood of the wall being overtopped or damaged during a storm surge (*ib.*: 30).

With this strategy, design specifications could be significantly reduced as well as the costs. Lastly, Spalding *et al.* suggest that:

coastal managers need to understand risk in terms of hazard, exposure and vulnerability prior to determining what role mangroves can play: the importance of mangroves in coastal defence and disaster risk reduction will depend both on the site characteristics and the local hazard context(2014:13).

Community and Ecosystem-Based Adaptation as an Emancipatory Resilience Practice

Sharma, inspired on the Indian forestry experience, suggests that

“if the communities are not fully on board, money spent on implementing sustainable development activities is wasted(2014).

Hence, they must be “involved” in what she calls a “Community Driven Adaptation”(ib.), in order to gain more autonomy and independence from outside forces, but also how to preserve the ecosystems of which their livelihoods depend on. The question of easily-accessible local funds to enable and empower community planning and decision-making has also been addressed by Page (2003) with regard to the exploitation and conservation of *Prunus Africana* in Cameroon.

The “community-driven adaptation” lens is also used by the Mangrove Action Project (MAP). They have adopted the Ecological Mangrove Restoration (EMR) approach as developed by Lewis (2005) in Florida, US, and incorporated the Community-based (CB) component into EMR to support community participation and stewardship in restoration projects in the developing world. Quarto and Thiam (2018) explain how the MAP Community-Based Ecological Mangrove Restoration (CBEMR) program aims to the empowerment of local communities by restoring and managing their mangroves in a way that would result in sustainable mangrove-based livelihoods. Further, they take on the recommendations of Field (1999), to focus on the intrinsic structure and function of mangrove ecosystems as well as “to integrate such aims with the welfare of the local communities dependent on the mangrove ecosystem for sustenance” (ib.: 390).

Analytical Framing and Methodological Considerations

The notion of resilience is defined by the IPCC as

the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions(IPCC, 2012: 563).

in turn, FAO’s own definition of resilience, as discussed by Hanazaki *et al.* adds

protecting, restoring and improving livelihoods systems in the face of threats that impact agriculture, nutrition, food security and food

safety Hanazaki *et al.* (2012: 162).

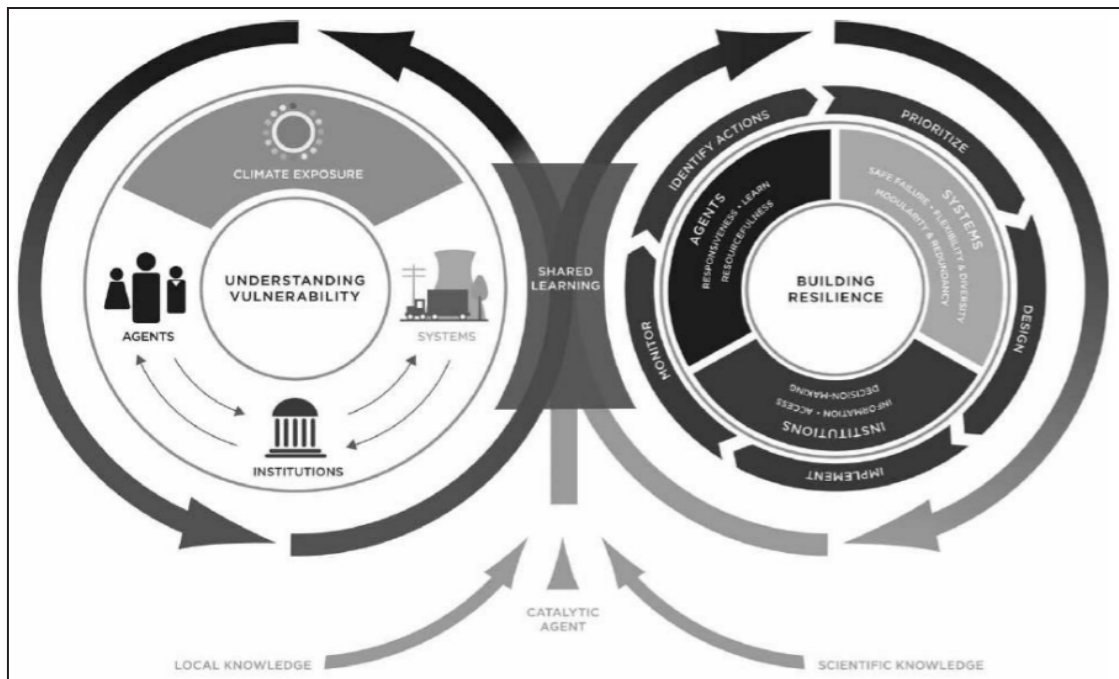
As their paper is focused on coastal communities there will be an attempt to understand the relation among resilience, livelihoods and food security with regards to the impact that “a shortage on fish catch may have a severe impact on a household that depends mostly on fishing for its livelihood” (*ib.*).

The analytical lens for this paper draws upon the concepts mentioned above, as well as on the ‘Binocular Framework’ proposed by Tyler and Moench to understand urban resilience, demonstrated as viable through resilience planning activities in 10 cities across Asia through the Asian Cities Climate Change Resilience Network (ACCCRN). This experience showed that it may be more effective for urban planners to see the problem as one of building resilience rather than putting the focus on adaptation policies to some particular climate risks perceived as likely to happen. The required actions to build urban climate resilience requires a framework that “provides guidance for what climate resilience means in practice and points to how it can be strengthened” Tyler and Moench (2012: 312), and its elements are listed as *systems*, *agents* and *institutions*.

The priority interventions suggested by the ACCCRN in relation to the resilient elements present in the framework resulted in a classification by the authors which included, just to quote some, in hydrological modelling studies to guide flood prevention investments for the *infrastructure systems*, mangrove restoration and protection in regards to the ecosystems, alternative livelihoods to increase choice for peri-urban poor as part of the agents capacities, and finally an engagement of communities in climate resilience planning by the institutions.

For the operationalization of the framework, Tyler and Moench elaborated a diagram (Fig. N° 1), which presents two tasks that integrate the elements and the characteristics in two loops: assessment of vulnerability (on the left hand) and resilience building (by the right side).

FigureN° 1. Diagram A framework for urban climate resilience.



Source: Tyler and Moench, 2012.

For the focus of this paper, it is contended that the management of protected areas within Freetown can be a process of negotiation between stakeholders in different spheres of power, such as government authorities and grass-root movements. To analyse this phenomena from a political ecology perspective (Robbins, 2008) the adopted framework will integrate resilience studies (Tyler and Moench, 2012) while bringing forward the “recognitional” dimension of environmental justice (Cook and Swyngedouw, 2012), for a more equal distribution of the environmental goods and bads across a city which is faced by a series of multidimensional risks such as floods, waste pollution and sanitation gaps. This will allow an examination of the possibilities of an “ecological citizenship” (Allen, 2014) through a socio-ecological services (SES) perspective.

By keeping in mind the notions of “conflicting rationalities” surrounding land tenure and urban planning (Watson, 2003), the analytical quest also involves the use of secondary data for the examination of “grey legality” and “informal-formal” power relations within protected Areas (Willox, 2018), to finally evaluate the possibilities of mangrove restoration by CBOs present in Freetown’s coast with the CBEMR (Quarto and Thiam, 2018) as a method to involve the actors on the ground in the process of achieving emancipatory resilience practices that could reduce their vulnerability.

In addition to the review of literature, the analysis draws from primary research conducted in seven communities in Freetown during April-May of 2018 and 2019, in which the author participated as a member of the field-research team in Cockle Bay,

within the DPU-SLURC learning alliance⁴. This primary data selected to understand the city coast is of a limited nature as it only draws partially on the list of settlements identified as “informal” in Freetown by SLURC-DPU, which incorporates 26 to 61 informal settlements, dependent on definition.

Top-Down Urban Planning of Freetown’s Coast: Understanding Vulnerability

As argued by Tyler and Moench, marginalization imposes both capacity and institutional barriers to allow adaptation. In addition, they put forward that resilience will be higher “where robust and flexible systems can be accessed by high-capacity agents and where that access is enabled by supportive institutions” (Tyler and Moench, 2012: 318).

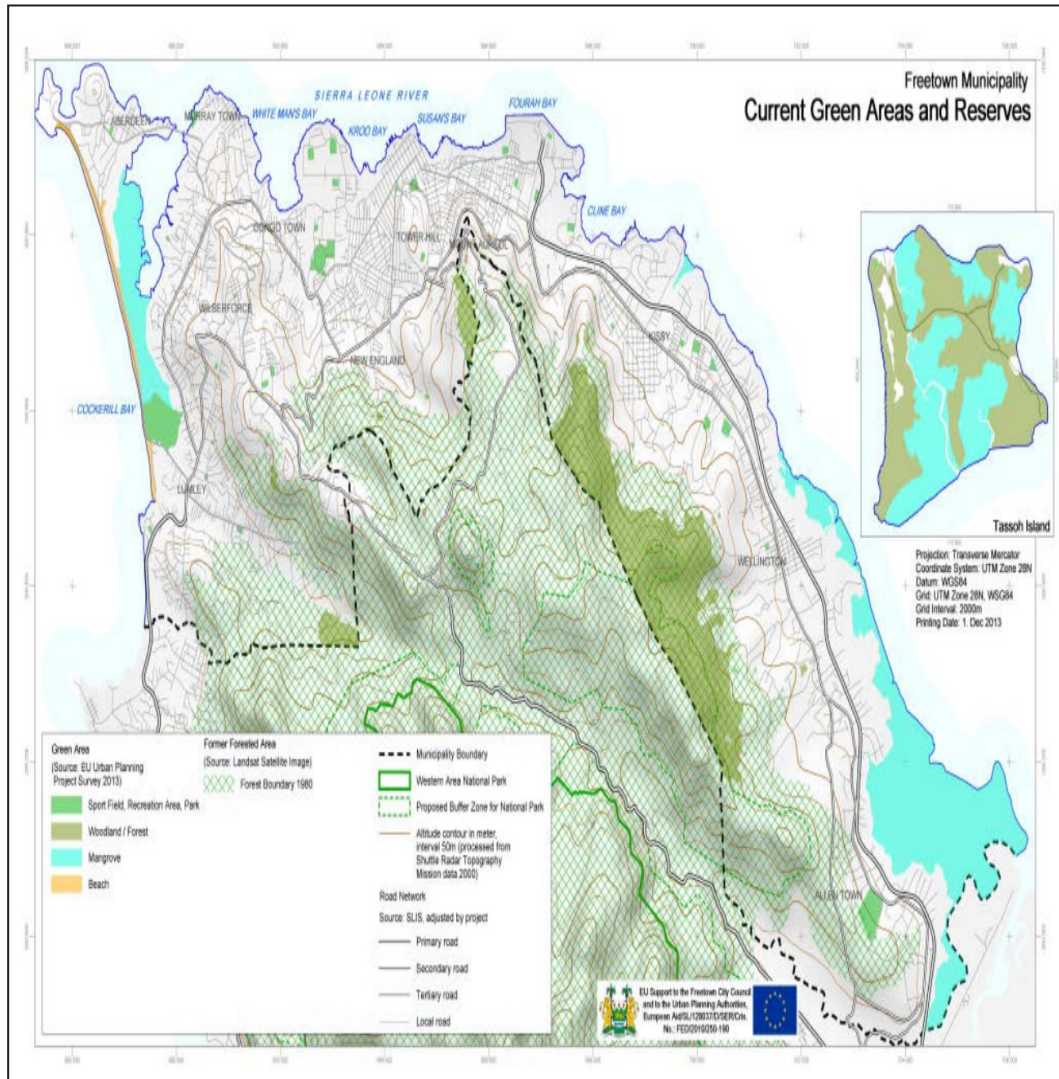
Freetown experiences two main seasons, which are the dry season expanding from November to April and the wet or rainy season which lasts from May to October, “and mean annual rainfall may range from 3,000mm to 6,700mm with more elevated settlements nearer to the sea having far higher rainfall” (Hayward and Clarke, 1996; quoted in Macarthy, 2012). The heaviest months of the wet season are of July and August, and in 2019 a single storm caused unprecedented damage to the city in general, but mostly to vulnerable communities as households were washed away (Thomas, 2019) and at least 6 people perished (Cham, 2019). This post-conflict city has no significant infrastructural development in place to protect the growing human settlements on the coast from hazards which result from the lack of investment in infrastructure.

The Sierra Leone River Estuary Ramsar site declaration (1999)

The Sierra Leone River Estuary (SLRE) was designated as a Ramsar site on 13 December 1999 and covers an area of 2950 square kilometres (08°37’N 013°03’W) (UNEP, 2007). Feka points out that “wood accounts for about 85% of energy requirements in Sierra Leone of which mangrove wood accounts for 60%.” (Feka, 2015: 346). The inappropriate legislations and policies in West Africa are collaborating to mangrove forest degradation, and according to UNEP (2007), oil spillage from tankers unloading at the main ports causes pollution and threatens the wildlife in the region, including the SLRE, which also suffers from untreated waste. During the years of the civil war (1991-2002) this situation was particularly dramatic as salaries of forestry and guards’ officers were unpaid for months to years, while logging and massive deforestation occurred in what are now protected areas (Map N° 2).

⁴ The Urban Africa: Risk Knowledge (Urban ARK) research programme is part of the The Sierra Leone Urban Research Centre (SLURC) and the Bartlett Development Planning Unit (DPU) at University College London partnership.

MapN° 2. Current Green Areas and Reserves of Freetown



Source: FSP, 2014.

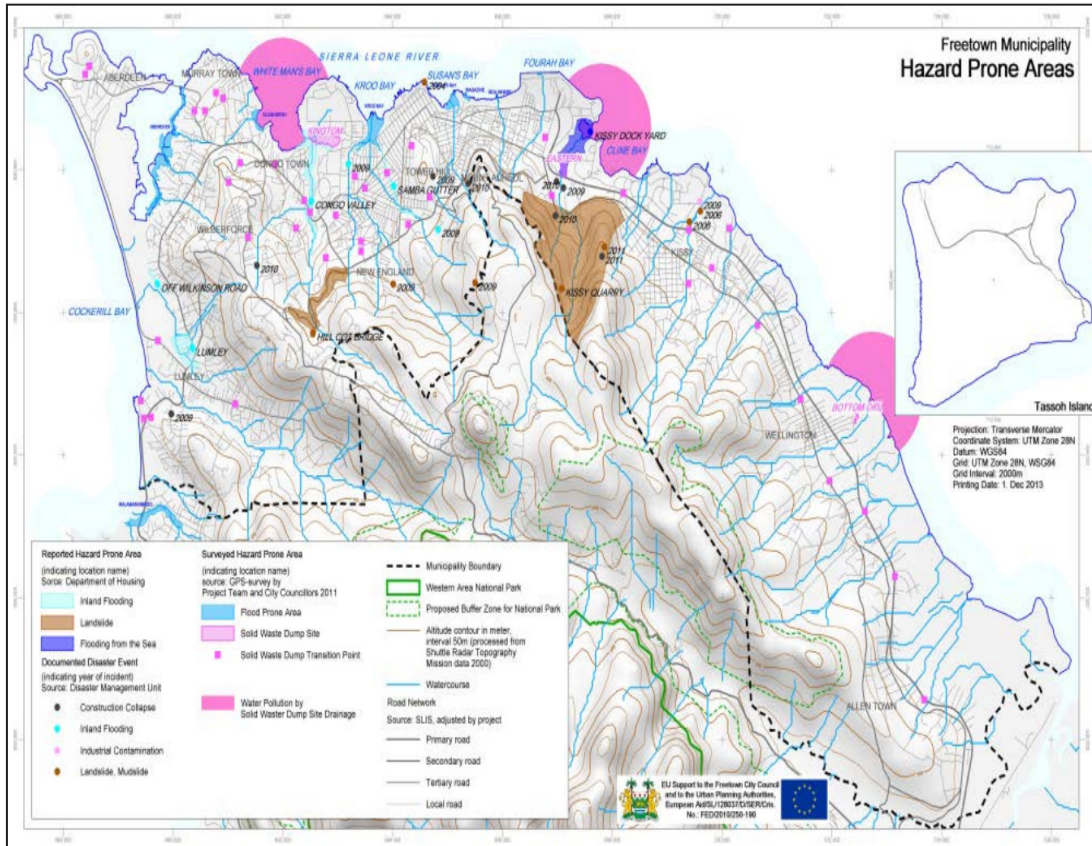
Ajonina explains that “maintaining a balance between the needs of the local communities and ecological integrity of the remaining wetlands ecosystems has been a challenging national and regional cause for concern for governments and different development partners in the Sub-Saharan region”. (Ajonina, 2016: 21), especially as wetland issues transcend national boundaries. He also acknowledges that payments for ecosystems services schemes as innovative voluntary financing mechanisms are also developing.

The Freetown Structure Plan (2013-2028)

The Freetown Structure Plan (FSP) was prepared with a view to improve land use efficiency, enhance the functionality of the city and improve the capacity of the city to accommodate the potential growth and the increased demands on services and facilities. As the Freetown population is estimated to nearly double within the next decade and grow from 998,000 estimated in 2012 to 1,912,000 inhabitants in 2028, the FCC has made an assessment of the Freetown Housing General condition. It should be noted that the informal settlements are not accounted for, only registered as "High Density Neighbourhoods" (50 and above Houses per Hectare), therefore formally invisibilized on the FSP maps by government authorities, which adds to the need of recognition to achieve environmental justice (Cook and Swyngedouw, 2012).

With regards to flooding, the FSP acknowledges that "Freetown still has many potential flooding areas free of settlements, and such areas must be protected from encroachment and any construction" (FSP, 2014: 132). This strategy of the plan is based on the forecast that at the coast the sea could rise as high as 3.03 m over the daily mean tide level, hence all construction below this level should be avoided. As these areas must be protected from encroachment and any construction, future building permits must ensure that no construction lower than 4.0m above the sea happens. This projection is aligned with Macarthy's assessment that "an approximate coastal population of 2,315,860, including all those living in the low-lying settlements of Freetown, would be at risk" (*ib.*:118). See Map N°3.

Map N° 3. Hazard-prone areas of Freetown.



Source: FSP, 2014.

The National Protected Area Authority Memorandum of Understanding (2018-Present)

The ongoing expansion of the built environment on the coast due to touristic projects (Wayne, 2018) also involves evictions (Cham, 2015; Koroma, 2016) in the West part of Freetown. This area has been classified as risk prone by the EPA and thus leading to eviction threats from this office and the NPAA. In response, a MoU between the coastal communities' representatives, the local government, and the NPAA was developed in October 2018 to prevent further banking for construction of vulnerable built environments in the SRLE, aiming to protect both the natural and built environment along the settlement (Photography N° 1).

As per the report of the NPAA on the MoU signing, there is an assumption that with consistent engagement and education there can be significant success in terms of conservation of the SLRE wetlands. In pursuit of this success, the SLRE Community Co-Management Committees (CMCs) were established within the PA proximity. For the purpose of efficiency, CMCs were grouped in clusters of 2-5 communities maximum, to enable neighbouring communities to address their challenges together in a unique learning process for conservation progress. The aim is to have functional CMCs in different areas of the SLRE with a MoU between them and the NPAA for effective

management of the site.

Photography N° 1. Banking in Cockle Bay reaching the limit of the NPAA demarcation pole



Source: Author, 2019.

The Transform Freetown Agenda (2019-2022)

By appealing to a rhetoric which acknowledges the people's right to the city, Mayor Yvonne Aki-Sawyerr pushes for an inclusive agenda titled 'Transform Freetown' (TF, 2019) to be deployed within three years (2019-2022). Among the many severe challenges that the city faces is the "Environmental Timebomb", particularly from the "bitter experience that unabated deforestation, coastal and river bed constructions and land reclamations have created a perfect recipe for flooding and landslides" (*ib.*: 5). The TF priorities are grouped within four clusters: Resilience, Human Development, Healthy City and Urban Mobility. As Freetown plans to become more resilient to the environmental, social and economic shocks and stresses that are a growing reality of the 21st century, and in order to help achieve this, TF plans to tackle challenges within three priority sectors: environmental management, revenue mobilisation and urban planning and housing (*ib.*: 8) (Table N° 1).

Table N° 1. Resilience cluster targets as per the TF Agenda.

Environmental Management	Revenue Mobilisation	Urban planning and Housing
<p>Target 1: Increase the capacity of Freetown’s 48 wards to recognise risk, and identify resilient solutions to prevent and recover from disasters.</p> <p>Target 2: Ensure an effective multi-stakeholder collaboration mechanism, and strengthen environmental governance.</p>	<p>Target 1: increase tax revenue fivefold, from 7 bn to 35bn Leone (Le) by 2020⁵.</p> <p>Target 2: Increase non-tax revenue threefold, from 2bn to 6bn Le by 2020⁶.</p>	

Source: Elaborated by Author, based on TF, 2019.

In considering the linkages between institutions, agents and systems, it is relevant to understand how local policy decisions may use the status of “protected areas” to ignore the tenure claims of marginal communities and limit provision to services, as described by Willox (2018), without actually solving the involuntary climate risks these vulnerable groups are faced with.

Bottom-Up Community-Based Organisations’ Practices: Building Resilience

Following Tyler and Moench’s “Binocular Diagram”, social learning is an essential element as the resilience process should involve both formal and informal knowledge and “it should be iterative in recognition of the time needed to build trust and develop responses across multiple scales of activity” (Tyler and Moench, 2012: 320). Moreover, agent capacities can be diagnosed through engagement of representative CBOs, and those can hold dialogues with institutions responsible for decision making.

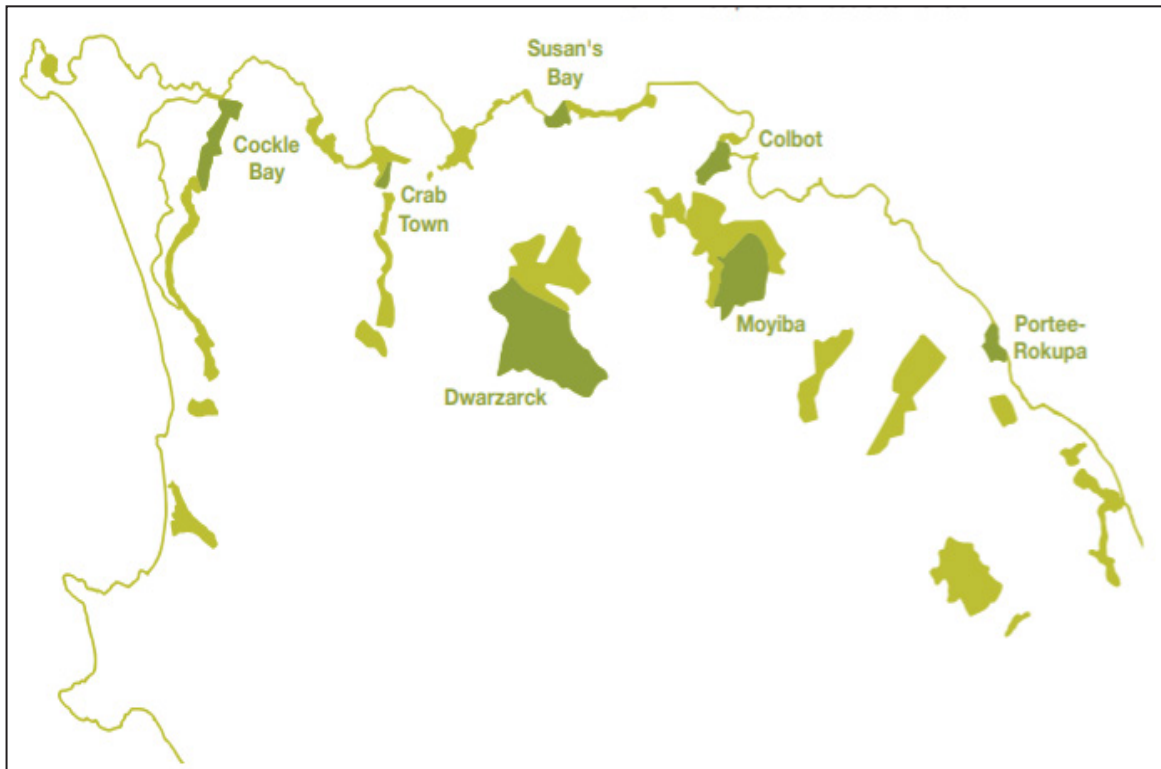
The case study area selection are three informal coastal settlements: Cockle Bay, Susan’s Bay and Portee-Rokupa, which respectively correspond to the clusters one, three and four of the NPAA’s MoU (Map N° 4). The civil war increased the influx of domestic migrants to the city, and due to limited available options, many of them turned to informal and risky occupations such as fishing. *Campo et al.* (2018a) showed that “fishing communities in Freetown are predominantly found in coastal areas such as

5 From 700,000 US dollars (USD), to 3,500,000 USD, at a exchange rate of 1 USD = 10,000 Leone in 2019.

6 From 200,000 USD to 600,000 USD by 2020, at a exchange rate of 1 USD = 10,000 Leone in 2019.

those in Aberdeen, Goderich, Old Wharf, and Portee, amongst others” Campo *et al.* (2018a:3). Another consequence of the war was the demographic influx to the city, and as access to land in other parts became more difficult, the situation in these coastal settlements led to the increase of land reclamation by the urban poor who wished to establish their homes near to the city centre.

Map N° 4. Informal settlements visited by UCL students on April-May 2019.



Source: DPU-SLURC Co-Learning Alliance, 2019.

Bhikoo *et al.* (2019) explored how dwellers, by incurring in practices of banking, are exposing themselves to hazards and accumulating risks, causing damage to property and loss of goods which drift them away from their places to improve their living conditions. They also found that that “there are many different techniques and methodologies for banking, depending on the location and available materials [which] include the use of mud and waste, which are unsafe and often toxic” (*ib.*: 6), and since this is done without formal permit from the FCC, the communities who bank find themselves under constant threat of eviction that results in avoiding long-term investments and housing materials with high levels of vulnerability. Finally, they threw some light into how the convergence of hazards of flooding in Freetown undermines the coastal communities’ resilience: “the disaster risks in coastal settlements are therefore an accumulation of the following factors: tidal surges coupled with heavy rain, extreme weather events, insufficient waste management, and lack of drainage systems and clogging of existing ones” (*ib.*: 2).

The Centre of Dialogue on Human Settlement and Poverty Alleviation (CODOHSAPA) is a non-profit NGO whose efforts aim to provide technical and financial support to the Federation of Urban and Rural Poor (FEDURP), its community counterpart, for the empowerment and transformation of communities. They are both part of Slum/Shack Dwellers International (SDI), a federation of shack dwellers across the Global South. In 2011, CODOHSAPA and FEDURP profiled the state of 11 coastal settlements and concluded that the forced relocation by the government is not only financially costly, but also disruptive of the social and economic fabric of those communities, as they depend on the services located near the centre of the city. The report recommended setting up a multi-stakeholder platform and a short and medium term upgrading of these informal areas. Based on those recommendations, the following analysis of the case-studies will take them into consideration.

Case-Study One: Cockle Bay

Cockle Bay is located along Aberdeen Creek on the western coast of Freetown, where the four subdivisions of the settlement are fast approaching the midpoint of the creek. With estimated 20,000 residents in 540 households, only 9% have access to electricity. Threats of evictions by the EPA and the FCC are a result of using the politics of risk, together with a lack of land tenure security and uncertainty caused an increased residents' vulnerability. Many CBOs such as the Community Disaster Management Committee (CDMC), local networks of FEDURP, WASH (Water, Sanitation and Hygiene) consortium, YMCA and Restless are present at the settlement. Koroma *et al.* (2018) detected that as Cockle Bay's main livelihood sector of cockle picking has decreased due to overexploitation of the cockles' mangrove habitat, sand mining has become one of the area's main subsistence livelihoods.

The idea of "Changing By Design" through the Community Action Area Plan (CAAP) in Cockle Bay was established as a tool for communities to advocate their rights and acquire a participatory decision making tool for future interventions. The entry point for the CAAP was the FSP mandate that "this detailed plan type must follow the planning goals and requirements made in the local plan and the structure plan for the area" (De Carli *et al.*, 2018: 38). In this way, the CAAP works as a middle-step between the FSP and the individual developments that take place in the settlement. The CAAP determined the strip of land on which Cockle Bay is located has developed across 186 hectares in size, and that "due to the fact that the land has predominantly been reclaimed from the low-lying mangrove forest, much of Cockle Bay is built on land that lies between 0-1 meters above sea level. As a result, the settlement is highly susceptible to coastal flooding and rising sea levels." (De Carli *et al.*, 2018: 20).

Following on the expeditious and descriptive analysis made by Leong *et al.* (2018), Kou *et al.* (2019) focused on the drivers of banking processes, identifying with the community four areas of focus to recognise the importance of zero banking as a means to achieve certainty to stay and capacity to upgrade on both individual and communal levels. These four areas comprise the four pillars of their strategy which are: Zero banking, Individual household upgrading, Community upgrading and Funding. They concluded that the pillar of Zero Banking must be achieved if the four communities of Cockle Bay are to attain both certainty to stay and capacity to upgrade. And despite attempts such as the

MoU and the threats of eviction, clearly, the process of land-banking is still occurring.

Map. N° 5. Development in Cockle Bay



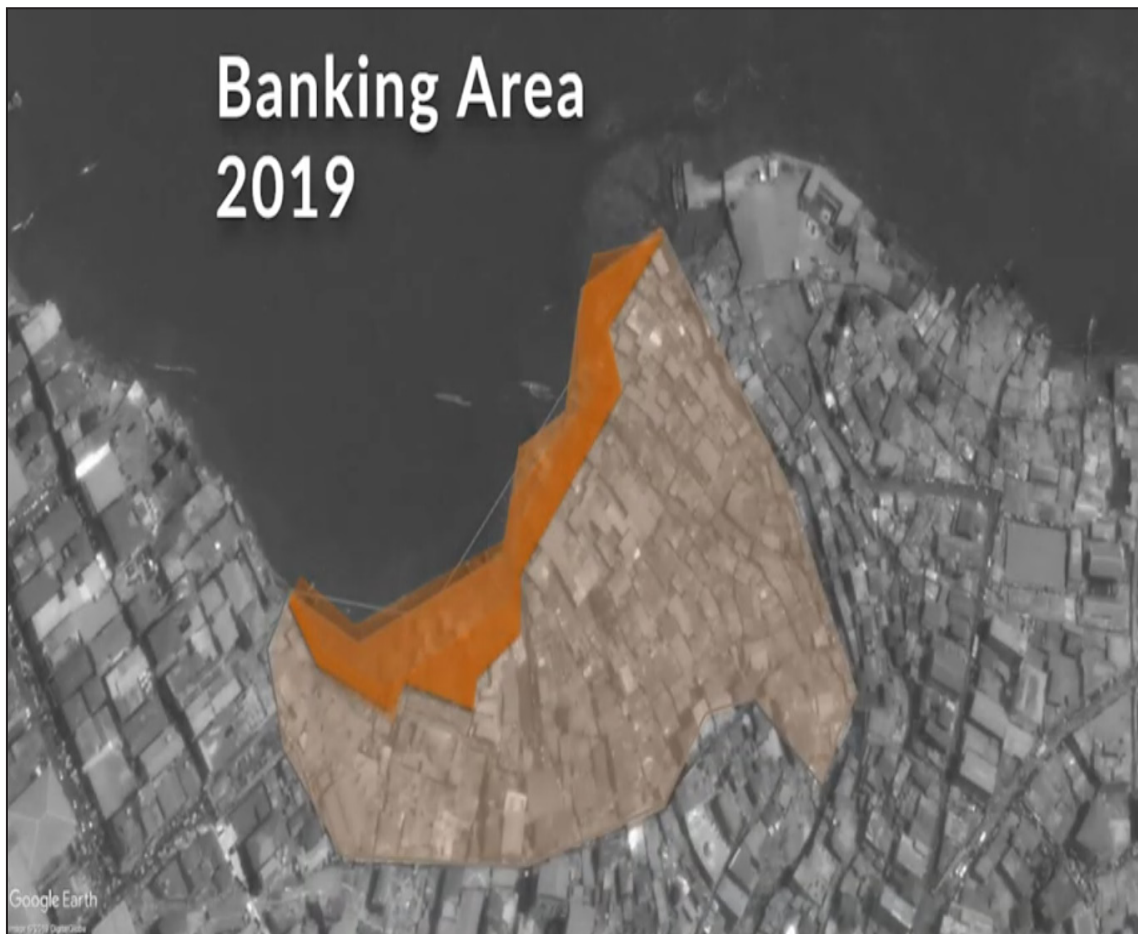
Source: De Carli *et al.*, 2018.

Case-Study Two: Susan's Bay

Susan's Bay location is in the central part of Freetown (Map N°6). Access to Susan's Bay is very restricted due to its location about 40 ft. below ground level. The settlement is a transnational sea business route between Freetown and Guinea, and also other parts of Northern Sierra Leone. The current estimated population stand at 28,000. The number of houses as of 2020 has grown to 621. The community is bearing two distinct political leadership structures even though the residents continue to see the settlement as one geographical unit. Furthermore, the low level of health and sanitation (Pratt, 2016) in the bay communities puts the Freetown population as a whole at risk of epidemics such as cholera during the rainy season. UN-Habitat (2006) suggested that the improvement of Susan's Bay should come by focusing on its strategic, social, economic and physical aspects.

While Aslaner *et al.* (2018) made a structural analysis of Susan's Bay from an urban metabolism perspective, Ackholm *et al.* (2019) proposed a strategy built on three key pillars: cooperative disaster risk reduction, community led upgrading, and resource mobilisation. Altogether, it aims to strengthen existing networks within the community while forging new connections between actors. In doing so, it offers principles of cooperative and democratic participation that empower the community to work towards a strategic vision for the future of Susan's Bay. These three pillars aim to capitalize on existing social capital in order to offer alternative practices for disaster risk reduction.

MapN°6. Expansion of land reclamation in Susan's Bay



Source: Ackholm *et al.*, 2019.

Case-Study Three: Portee-Rokupa

Portee-Rokupa is located in the eastern part of Freetown. Recent population estimates through the ReMapRisk Survey stand at 7,000 in 2017. This settlement also reclaims available land at the seafront to cover their housing needs, which leads to people refraining from gradually upgrading their houses due to tenure insecurity. Disaster events such as mudslides and seasonal flooding have caused death, displacement and an Ebola outbreak which affected this community (Macarthy *et al.* 2017).

As per Koroma *et al.* (2018), fishing is a key component of livelihoods in the coastal settlement of Portee-Rokupa, which has good access to fish markets across the city. Campo *et al.* (2018b) focussed their field research on the location and livelihoods as key variables undermining environmental risk, service accessibility and occupational

hazards along the fishing value chain of these settlements. The problem they found was that higher risk exposure in informal settlements is enhanced by poor waste management polluting the ocean and affecting the fish yields. Additionally, inefficient water management causes floods, washing away valuable equipment such as wood, nets and boats, ultimately impacting the local economy.

Addressing the importance of the CBOs stand, Hallqvist *et al.* (2019) explored how to empower community-led transformation regarding the WASH committee. Adding to this, Macarthy *et al.* (2017) review of the humanitarian crisis and responses in Portee-Rokupa reveals that “meanwhile CBOs argue that the main challenge is not the lack of capacity, but lack of support. As a result, NGOs’ narratives end up reproducing the lack of recognition of CBOs”, highlighting the need to bring forward the debate of DRM in terms of environmental justices (Cook and Swyngedouw, 2012). Within the context of the MoU, if the CBOs in Portee-Rokupa were able to articulate humanitarian efforts with both local and national government agencies, and also with NGOs, hence, they would be more than capable to address biodiversity issues such as mangrove restoration for the sake of increasing the stock for fishing(Photography N° 2).

Photography N° 2. Fishing community of Portee-Rokupa



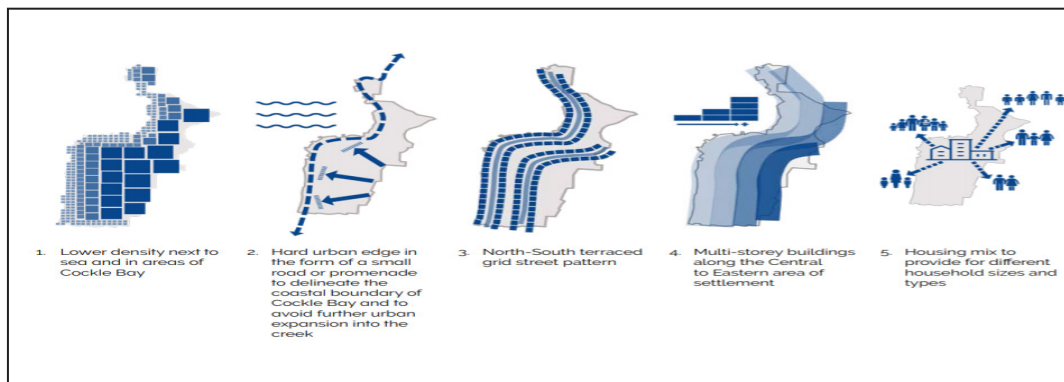
Source: Hallqvist *et al.*, 2019.

The Bridge and Window of Opportunity of the MoU

Since Cockle Bay was designated within the first CMC to take part in the MoU, it has the prospect to turn into a key settlement and become a “lighthouse experience” in terms of resilience-seeking practices on the coast of Freetown. The result of this could have some positive impacts on the DRR strategies taking place in other coastal communities of the city, such as Susan’s Bay and Portee-Rokupa.

According to Frediani *et al.*, the participatory methodology of CAAP could collaborate to the process of “creating localised action area (or neighbourhood) plans that involve communities from informal settlements as well as civil society and government actors” (Frediani *et al.*, 2018: 44). The different stages of Diagnosing, Dreaming and Developing within the CAAP established a principles and options diagram on a home, community and city scale (Figure N°2).

Figure N°2. Design guide diagrams for Cockle Bay



Source: De Carli *et al.*, 2018.

As per the interviews conducted by Urban ARK on the coast of Freetown (see Appendix) testimonies were collected on issues with the drainage due to waste and damage caused by wind to a house next to the sea in Susan’s Bay, as well as the hazard that strong winds presents for fishermen in Portee-Rokupa. Facing these problems, the momentum of the MoU could help to push for new nature-based resilience strategies. The following chart will be used to assess the agent’s characteristics within the context of each of the case-studies.

Table N° 2. Freetown Resilience Elements as per Tyler and Moench’s “Binocular Diagram”.

Agents	Institutions	Systems
Responsiveness	Rights and entitlements linked to System Access	Flexibility and Diversity,
Resourcefulness	Decision-making processes	Redundancy and Modularity
Capacity to Learn	Information flows and Application of new knowledge	Safe Failure
CBOs and the MoU CMCs	FSP, TF and the MoU / FCC and NPAA	CAAP
Freetown Resilience Elements		

Source: Author, 2019.

Conclusion: A Shared Learning

Tyler and Moench argue that “once dialogue has been catalysed, more targeted interactions follow to ensure that the voices of marginal groups are heard and to improve understanding among all those engaged of core elements of the framework (e.g. systems, agents, institutions and exposure) and how those interact in the local context” (Tyler and Moench, 2012: 321). It is through building agent resourcefulness and strengthening capacities of institutions that a shared learning dialogue for resilience can be achieved. If implemented in Freetown, the “Binocular Framework” should focus on sustaining effective recognition and participation of coastal communities in the planning process in order to achieve environmental justice by overcoming poverty and vulnerability (Cook and Swyngedouw, 2012), as it was also identified by the ACCCRN experience that “measures to address the resulting ecosystem degradation or climate risk directly are unlikely to succeed without recognition of the underlying injustices” (Tyler and Moench, 2012: 319).

Just after the end of the Civil War, the Sierra Leone Vision 2025 (UN-Peacekeeping, 2003) provided a critical account of the country’s challenges in terms of peace and development, with many of its objectives still to be accomplished, particularly about the environment. Freetown could set a local example to the rest of the country by reviewing the development strategies in the following sectors related to the wetlands ecosystem: agriculture, forestry, fisheries, tourism, land tenure, education, employment and biodiversity.

According to Allen *et al.* (2019) we must rethink the way the governance of urban resilience currently works in order to enhance the capacity to act of those most vulnerable to become trapped in risk accumulation cycles to disrupt these traps in a strategic, inclusive and collective manner. Is there a differential ability of ongoing resilient-seeking practices to disrupt risk traps? Is the governance expanding the political space to enable abridged collective action among the different stakeholders such as the urban poor, customary authorities and local governments?

Implementing community-led processes to build research capacity to address urban equality such as the CAAP could also include innovative community-ecosystem based adaptation strategies which could enable local residents – old settlers and newcomers - to tackle risk accumulation and enhance their agency to respond and overcome the risks they are facing, through just, equitable, and autonomous mechanisms. This could happen through a formal recognition from the government authorities of the vital role that the CBOs play in terms of DRR, which is a key step towards achieving urban resilience and environmental justice.

The payment of ecosystem-services appears to be challenging in highly unequal societies, particularly when the most vulnerable human settlements receive almost no external support to overcome the energy, housing and livelihoods deficits, which is an obstacle in order to overcome the degradation of the mangrove forest within the SLRE. In order to find a way out of these risk cycles, the diverse elements mentioned during the analysis could be summarized to see how those initiatives sometimes overlap and complement each other by searching for the right scale for governance and

resolving rather than enhancing conflicting rationalities (Watson, 2003) and the “grey legality” within PAs (Willox, 2018).

The idea of “removing the slum from the people, and not the people from the slum” could be achieved via nature-based solutions: drawing on the CAAP for Cockle Bay, the use of ‘green infrastructure’ consisting of restored mangroves acting as a buffer-zone for resilience on the coast would allow controlled densification of the settlement while delineating a coastal boundary to avoid further urban expansion into the coastline. A shared learning experience like this could go a long way for the design of a resilient coast in Freetown.

A potential point of further research could be the application of the CAAP adapted to the specific needs of other coastal communities as a pathway to comply with the MoU’s objectives of zero-banking and at the same time put an end to the eviction threats, which would also reduce the communities’ vulnerability to risks and strengthen their sense of auto-governance through collaborations with the customary government authorities.

Photography N° 3. Still well preserved mangroves on the East coastline of Freetown near Allen Town.



Source: Author, 2019.

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Annex

UrbanARK housing vulnerability classifications for informal settlements:

Indicator	High	Medium	Low
Housing Vulnerability	Temporary (corrugated iron- sheets - roof and walls ("pan body") / mud brick walls /without concrete floors (stilts / bare earth)	Semi-permanent (mud brick walls, corrugated iron sheets and concrete floors)	Permanent materials (Iron-sheets roof, brick/cement walls and concrete floor).
Energy poverty	Charcoal / firewood for cooking	Diesel/paraffin for cooking	Electricity / Gas for cooking
Tenure security	Have title deeds	Private owned but no title	rented

Source: Available at: <https://www.arcgis.com/apps/MapSeries/index.html?appid=6fa93fe520bb4d14a627b2546e8c8764>. Consulted in August 2019.

Acronyms:

ACCCRN	Asian Cities Climate Change Resilience Network
ASF-UK	Architecture Sans Frontières – UK
CAAP	Community Action Area Plan
CBA	Community-Based adaptation
EBA	Ecosystem-Based adaptation
CEBA	Community and Ecosystem-Based Adaptation
CBEMR	Community-Based Ecological Mangrove Restoration
CBOs	Community-Based Organisations
CMCs	Community Co-Management Committees
CDMC	Community Disaster Management Committee
CODOHSAPA	Centre of Dialogue on Human Settlement and Poverty Alleviation
DPU	The Bartlett Development Planning Unit
DRM	Disaster-Risk Management
DRR	Disaster-Risk Reduction
EPA	Environmental Protection Agency
ESA	European Space Agency
FAO	United Nations Food and Agriculture Organization
FEDURP	Freetown Federation of the Urban and Rural Poor
FCC	Freetown City Council
FSP	Freetown Structure Plan
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
IUU	Illegal, Unreported and Unregulated Fishing

IUCN	International Union for the Conservation of Nature
MAP	Mangrove Action Project
MEA	Millennium Ecosystem Assessment
MPA	Marine Protected Areas
MoU	Memorandum of Understanding
NAPA	National Adaptation Programme of Action
NGO	Non-governmental organisation
NPAA	National Protected Area Authority
PA	Protected Area
PES	Payment for Ecosystem Services
RAMPAO	Réseau Régional d'Aires Marines Protégées en Afrique de l'Ouest (Regional Network of Marine Protected Areas in West Africa)
REDD+	Reducing emissions from deforestation and forest degradation
SDG	Sustainable Development Goals
SDI	Slum Dwellers International
SES	Socio-Ecological Services
SLD	Shared Learning Dialogues
SLRE	Sierra Leone River Estuary
SLURC	Sierra Leone Urban Research Centre
TF	Transform Freetown Agenda
UNEP	United Nations Environment Programme
UN-HABITAT	United Nations Human Settlements Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNISDR	United Nations International Strategy for Disaster Reduction
UPE	Urban political ecology
URBAN ARK	Urban Africa: Risk Knowledge
WASH	Water, Sanitation and Hygiene Consortium
WAVES	Wealth Accounting and the Valuation of Ecosystem Services Partnership
WWF	WorldWide Fund for Nature

YMCA	Young Men's Christian Association
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WATERLATGOBACIT