Speculative Futures of Global South Infrastructures

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18.1 Introduction

18.1.1 Worldbuilding Design Toolkits

The distinction between science fiction (SF) and future fiction (FF)[1] is relatively easy to frame, but the distinction between FF and what is called architecture fiction (AF)[2] is less easy to define. While SF provides a genre framework within the mass-cultural genre system (Rieder 2017), becoming part of a technoscientific outlook brought to bear on every aspect of the universe, FF is distinguished by its specific focus on planetary futures and/or human futures. FF is thus closely aligned to "mundanity" and the mundane SF movement[3] distinguished not only by priority

and orientation of fiction, but also by the consequences and politics of such orientation. Where SF provides the genre framework for fictional worldbuilding, FF is also about political alignment and the *raison d'être* for describing futures within fictional worldbuilding. FF is also thus naturally aligned to contemporary futurisms,[4] which distinguish between themselves and SF

Syms (2013).

[4] These new futurisms include, for instance, Afro and Africanfuturism(s), Indigenous Futurism(s), Latinxfuturism(s), Indofuturisms, Desifuturisms, Asianfuturisms, Gulf- and Arabfuturisms, Ricepunk, Silkpunk, etc. While I do not discuss definitions for these futurisms here, some of their connective definitional tissues are listed in different sections below. Furthermore, as Global South (GS) is a highly contested term, some of its critical shortfalls in terms of scope also impact these new futurisms. For instance, many of these futurisms are produced by creatives from or based in the Global North (GN), just as some of the central frameworks dealing with GS concerns have also emerged in the GN. For instance, the systemic infrastructural concerns and general disadvantaged conditions of indigenous or person of colour (POC) communities in the GN that are some of the principal producers of contemporary futurisms are often quite similar to the systemic infrastructural concerns of the GS. The "GS" in connection to these new futurisms thus often becomes a marker of systemic and infrastructural non-privilege regularly eliding geopolitical borders and boundaries. In this text, however, I focus on the GS specifically in terms of geographical distribution.

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[1] FF is an older term from the pulp era of SF. However, its conceptual framework discussed here is closer in principle to Nature's *Futures*, Intel's *Tomorrow Project*, MIT and Technology Review's *Twelve Tomorrows*, and other such ventures that emphasize near-future human concerns.

[2] AF is Bruce Sterling's coinage (2006) discussing the work of J. G. Ballard, developed further by Kazys Varnelis. See Varnelis (2011)—the conceptual framework discussed here also resembles what Brian David Johnston identifies as "Prototype Fiction".

[3] The mundane movement developed in the context of Geoff Ryman's "Mundane Manifesto" in 2004 and further developed in the context of Afrofuturism by Martine

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even as they recognise possible overlaps (Dillon et al., 2021 Forthcoming). Furthermore, while AF and SF may be understood as synonymous, AF is closer to FF, since it is structurally mundane and the fiction acts as a narrative vehicle for demonstrating conceptual prototypes[5] that address pre-identified socio-technical challenges. The prototypes may or may not be immediately realisable but their presentation and speculative design are a prerequisite for future development.[6] AF thus has a heuristic tendency that is not necessarily fictional.

These three terms are employed in this chapter as concepts describing a design principle. SF works as a genre toolkit, a megatext to which different kinds of futures and futuristic narratives may be immediately aligned. FF works as a speculative toolkit specifically concerned with the future of humanity, including its socio-political futures. AF works as a prototyping toolkit in which fiction becomes a design tool. The three can overlap but harness different principles and purposes.

This distinction makes it possible to approach the point and purpose of these new futurisms from the Global South (GS)[7] that this chapter deals with specifically in terms of infrastructure, making it clear that speculations within these new fictions have a future-oriented political and practical (as design) purpose, one which often aligns such futures as "*CoFUTURES*".[8] While I do not imply or wish to imply that these different futurisms from the/based in the GS are interchangeable in their responses to the future,[9] we can study similar infrastructures in their imagined futures for indicators of adaptable and shareable emergent strategies.[10]

18.1.2 Infrastructure, Future Fictions, and the GS

FF's concern with infrastructure stems from its general worldbuilding principles involving human futures. While almost all near-future fiction deals with some forms of infrastructure, for GS narratives the foci are generally on infrastructural stressors that accompany transitions to further technologised futures. It is also often interested in descriptions of collapsed infrastructures, or uneven infrastructural developments, set against questions of economic inequalities and social discord. Proximity to more resource-rich zones, which is perhaps the quintessence of the South constructed vis-à-vis the North, often becomes a means of commentary on the state of affairs in the everyday.

One common framework is that of historical unevenness, where the past operates as a living artefact affecting possible futures of social mobility, including futures of infrastructure. The past also affects the historicity of the futuristic imaginary since it creates a structure of continuity for human futures. In addition, since many sites in the GS draw upon pre-colonial legacies, the sense of the *longue durée* specifically contrasts with

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[5]Cf. Johnson, Brian David. *Science Fiction Prototyping: Designing the Future with Science Fiction*. Morgan & Claypool, 2011.

[6]This is the ethos of the Speculative Futures and Speculative design movement. See Dunne and Raby (2013).

[7]There are also similar futurisms that have emerged in other infrastructurally poorer regions that might be identified as the "Global East" such as from Eastern Europe. All these other futurisms, which one may call peripheral futurisms, need to be understood within a shared process of future-making that recognizes local problems and variances in terms of their connections to global challenges and responses. For a recent Global East theorization, see Martin Müller (2020). For an infrastructurally inflected analysis that thinks between the GN and South in terms of medical infrastructures, see Banerjee and Castillo (2020). It is also important to note that in certain classifications four Eastern European countries (Armenia, Belarus, Georgia, and Ukraine) fall under the GS category.

[8]The "Co" here stands for *Co*mplex, *Co*eval, *Co*mpossible. For a brief description of the term and its implications, see Chattopadhyay (2020).

[9]There is thus the felt political necessity to group marginalised futurisms as "Alternative Futurisms" as a means to find alternative strategies of sharing worlds and futures from marginalised perspectives. This grouping also resists co-option in frameworks such as SF or global SF.

[10]I borrow this term from Adrienne Maree Brown, whose Afrofuturism-inflected strategy can help reconceptualise possible futures from an anti- and decolonial perspective. See Brown (2017).

imposed infrastructures that are seen as a product of colonial, postcolonial, and neo-colonial legacies. The juxtaposition of *longue durée* historical pasts with experiential presents and their congealed expansion as future history within FF exhibits the continuities of infrastructural problems with socio-cultural ones.

Many of these concerns have become central to the type of FF identified as "Climate Fiction", which specifically deals with infrastructural stressors in a world severely affected by the negative impact of anthropogenic climate change. Imagining and re-imagining future habitats, whether in ravaged ruined landscapes, toxic and waste-filled environments, poorly maintained decrepit urban spaces, desertified zones with limited food and water security, et cetera, are regularly employed as tropes in climate fiction. Perhaps more pertinently, for the purposes of this chapter, climate fiction is not the only production of the GS but has as many adherents and exemplars from the GN (e.g. Canavan 2014; Dwyer 2020; Trexler 2015). By specifically looking at GS FF however, we might be in a position to understand emergent concerns about future infrastructures and infrastructural futures that have not yet received strong attention within other FF. However, even if some of these reflections might tend towards that direction, this chapter does not seek to be a trends analysis[11] for policy purposes, but an engagement with speculative futures within the context of artistic and cultural production.

18.1.3 Climate Change, Technological Change, Demographic Change

While climate change acts as a principal modality for discussions of many of these stressors, infrastructures are also further related to two other modalities, namely technological change (which describes the relationships between new, emergent, and abandoned technological artefacts), and demographic change (usually in terms of population growth). It is also in these two modalities that we see some of the immediate differences in GS futurisms. Demographic change in contemporary GN FF, due to generally plummeting birth rates, is inflected towards racial and ethnic differences and conflicts, generally framed within the challenges of migration and integration, or concerned with declining birth rates and fertility more generally.[12] Demographic change in GS FF, due to generally advancing birth rates, has to do with population management and imaginaries of systemic and infrastructural resilience in overcrowded, resource-strapped urban spaces. Humans—and humanity—are generally a problem in the "limits of growth" narrative borne out of a specific GN futurisms mindset, which also generates futuristic imaginaries of walls and border narratives on the dystopian side and the endless frontiers of outer space after the exhaustion of the "West" on the utopian side. GS futurisms have to do with the conditions of dealing with the global majority, the densest populous regions of the world, where cooperation generates far greater future possibilities for already stressed infrastructures, with both population growth and infrastructural stress as two conditions not readily imagined as likely to change.

Technological change in contemporary GN futurisms has to do with the declining possibility of technological solutionism in regions that due to economic advantages have in the post-WWII period taken their own technological prowess and their ability to solve societal problems through technological management taken for granted. The concerns are thus often of a significantly higher order, and the ability to imagine near-future technologies—and the problems generated by them—are principal foci. This also applies to the gut-wrenching (or hand-wringing) inability to solve problems by technological means for challenges that have been generated by techno-

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[11] An example of such work is Yudhanjaya Wijeratne et al. (2019). Perhaps unsurprisingly, Wijeratne, who is Sri Lankan, is also an accomplished SF writer.

[12] The number of GN FF dealing with migration-related demographic changes, usually dystopian works, have skyrocketed in the recent years.

capitalism, to begin with.[13] The image of "being stuck" is a peculiarly privileged mode of engaging with the world often found in the technology-inflected futurisms of the GN, since the capacity even for imagining possible futures is reliant on continued technological supremacy. The GS narrative, on the other hand, has its own limitations, since economic disparities are far more easily visible in terms of technology and access to technology, and the state of unequal/uneven development requires, on the one hand, a model for sustainable growth at the systemic and infrastructural level for all, and on the other hand, a model for degrowth and more relaxed resource use towards more equitable distribution of resources.[14]

All three modalities become interconnected with the design of speculative futures to be found in contemporary FF of the north and south, entangling different parts of the problems or imaginary solutions—or imaginary problems and solutions. Most importantly, all of these modalities in FF are in their final instance about sustainability—whether development, non-development or anti-development enter the picture depends on the specific narrative take on the infrastructure under discussion. In the following sections, I will discuss the different types of infrastructure described in GS SF, before returning more specifically to the question of sustainability.

18.2 Infrastructure in GS SF

18.2.1 Recycling and Waste Management Infrastructures

The degree of societal success depends on the ability to manage waste since waste is an essential by-product of growth. Typically, the management of waste within FF involves three things: reducing waste, reusing waste, and relocating waste. These generally have different aesthetic variations within FF, but it is reusing waste that particularly differentiates the North-South divide in infrastructural terms. The South is the recipient of the relocated waste of the North within the global economic structure, and is itself a massive producer of waste that is both a result of its economic malnutrition due to the same structure as well as its reduced ability to relocate waste elsewhere. The waste of North consumer culture is received and transmuted in the GS, and consequently, this has been the focus of a significant amount of FF from the region.

However, reducing and reusing waste have also found their way into different kinds of FF, both in works focused on transformative positive adaptation (for instance, in genres such as solarpunk) and in post-apocalyptic narratives set in wastelands of trash (where recycling is a necessity rather than a convenience). Climate fiction engages with themes of trash and waste management, especially in visual media, since trash is seen as an easy marker of societal disarray, blending in concerns about consumption and overpopulation in its wake. In many GN narratives, visible trash serves as a synecdoche of people and places, especially the GS, and narratives that are overtly or covertly ecofascist readily activate trash as a motif. In more mainstream works, for instance, from the Anglophone film industry,[15] the slum imaginary is repeatedly presented as an

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[13]The principal model for the GN imaginary of technological change is cyberpunk and its corporatised dystopia.

[14]A leading thinker for such a model is Arturo Escobar, whose work engages specifically with post-development design futures in the Latin American context. However, the movement is quite varied with adherents in different parts of the GS (e.g. Escobar 2018, 2020). These perspectives often bring up indigenous concerns about land and resource use alongside a general resistance to the narrative of continuous development. One can also refer to the Degrowth response to the ecomodernist manifesto in this context (Caradonna et al. 2015).

[15]These can include more niche works such as the Mexican director Alfonso Cuarón's adaptation of P. D. James' (2006) "Children of Men", or mainstream SF such as the South African director Neill Blomkamp's (2013) "Elysium", or even the innumerable young adult films such as the Maze Runner series or the Hunger Games series.

inevitable condition of the future, one where class conflict and resource scarcity break the façade of the prosperity of the GN. Waste management infrastructures—usually machines and robots but generally technological infrastructures—are thus repeatedly brought into place to manage societal trash. Prominent examples include well-known films such as the Disney-Pixar film Wall-E (Stanton 2008) directed by Andrew Stanton, or even works that play with North-South divides in terms of slavery and human trafficking such as the Spanish-Bulgarian film "*Automata*" (Ibáñez 2014) or the American film "*Downsizing*" (Payne 2017). In all these films, but especially in "*Downsizing*", consumerism is shown to be an inherent flaw in the GN logic of development, where neither the constant flow of GS labour—neatly separated by a border wall—can effectively fix, nor an escape to an ostensibly sustainable life (in Norway) is any kind of solution.

GS FF narratives are placed in a situation where, even though the problem of inadequate waste management infrastructures needs to be highlighted, this easy synecdoche needs to be challenged, by being more open to both internal challenges of societies/states, and to the external pressures brought to bear on them to fit what are often considered locally as arbitrary development paradigms. Furthermore, while GN narratives dealing with trash and waste management infrastructures principally focus on the problem of reducing waste or relocating waste (which becomes impossible in a dysfunctional system), GS narratives are generally more focused on the problem of reusing waste since it better fits the problem of spatial development. To take some examples, Blomkamp's (2009) breakout film, "*District 9*", set in Johannesburg, additionally takes on the legacies of apartheid and unequal distribution of wealth to show the collapse of waste management infrastructures and the transformation of regions into slums with their own internal economies of recycling and trash management. Hao Jingfang's (2014) novella "*Folding Beijing*" foregrounds class divisions in systems of waste management. In this latter novelette, which could be considered an example of AF as

well as FF, the city itself is a divided space where different classes operate at different times of the day, ejected to the surface during specific hours to handle the specific tasks required of them. The protagonist, who is a waste worker, realises in the last part of the narrative that the entire system of waste management infrastructure is a ruse to maintain unequal distributions of wealth, class divides, and existing work conditions, at a time when automation can be a real (even if partial) solution. Such a narrative also challenges GN escapism, where advanced technologies are created to maintain existing conditions of labour instead of being employed to fix societal problems. The literal waste in "*Folding Beijing*" (Jingfang 2014) is a metaphor, nevertheless a red herring one, where the real problem is deep societal inequalities.

Another short story, Anil Menon's (2021) "Shit Flower", set in future Mumbai, also presents the problems of a society riven by internal divisions, where sewage system AI have been hacked causing a "brownout", flooding many parts of the city with sewage. The entire narrative dramatises the politics of waste management infrastructures, from bureaucratic levels where the primary concern is preventing the richer parts of the city from being affected by the brownout, to technocratic ones where bad mood, illness and ageing are managed in a policy-like manner, as all are seen to be a waste. Strewn with North-South jokes as much as jokes about Indian class, caste, and religious divides, the return of consigned garbage back to the surface has a curious parallel with societal treatment, where memory itself is often regarded as the garbage in the paradigm of continuous development, and which needs to bury memories of other times to be seen as future-aspiring.

Perhaps the most powerful recent novel dealing with the theme, Chen Quifan's (2018) "*Waste Tide*", brilliantly parallels the techno-futuristic development narrative of the Silicon Valley by contrasting it with the waste management infrastructure of the Silicon Isle, a hub of global e-waste processing modelled on Guiyu, China. Chen targets the consumerism that generates the e-waste that relies on GS exploitation as well as

the waste management infrastructure that depends on local systems of exploitation mirroring the same consumerist structure. The "designed in California made in China" model serves in neither planetary nor local terms since they are based on a paradigm of development that will ultimately destroy both. This is also the point of Chen's critique, which, even though it is simultaneously SF, FF, and even AF, can easily be called a striking fable of our present.

As in the case of GN narratives, visual representations of trash and waste management are also quite common. Trash indeed has become the central point of contemporary art from the GS artistic FF, such as, for instance, in the work of Indian artists like Sahej Rahal and Asim Waqif, both of whom extensively use and imagine societal trash and waste innovatively recycled and blended into the infrastructure of the future city. The Beninese-Belgian artist Fabrice Monteiro's (2013) series "*The Prophecy*" is another striking representation of the futures of trash from a Senegalese perspective, imagining spirits built of trash that arise from the depths of the oceans and other polluted landscapes in order to make humans recognise the horror of their ways. Monteiro's series is also a direct critique of GN consumerism and seeks to question its duplication—and the duplication of the progress narrative—in African countries. Another future-facing narrative, the Swahili film "*Mti Wakiwuli*" (*Shadow Tree*) (Viswanath 2014), seeks to inspire the possibility of recreating and refreshing life and life support structures in a landscape inundated by trash and waste, where, instead of promoting a further cycle of development, the recycling system inherent in nature (transpiration) is seen as a technology for sustaining life. While neither narrative is utopian, they transmute waste generation that is the byproduct of development into imaginaries of recycling infrastructures for possible, positive futures.

18.2.2 Energy Infrastructures

The focus here is primarily on possible futures of renewables or the lack of energy resources at the end of our contemporary energy era. Unlike other infrastructures, energy discussions often muddle the simplicity of a North-South divide, since petro-wealth in GS nations does not automatically confer markers of prosperity that characterises the divide, nor do the potential futures of renewables automatically create that prosperity in other regions. Energy infrastructures in FF from the GS thus often depend on whether or not the current specific GS economy, when imagining possible futures, benefits from a continued fossil fuel economy or not. Thus, in some cases, sometimes imagining potential energy futures not dependent on fossil fuels can act as a means for greater prosperity (for instance, in Latin-American or Latinxfuturist works). In other cases, the shift to renewables heralds the end of futures that have long been modelled on GN consumerism (for instance, in Gulf- and Arabfuturist works). The growth of industrialism and accompanying accelerated energy needs are thus equally fraught with postapocalyptic potential, and new genres such as solarpunk venture towards imagining alternatives to these strategies. Solarpunk has found its best home among GS futurisms in works by Latin-Americans and Latinx creatives but is also gaining ground in Africanfuturisms. Solarpunk, in particular, has a certain instrumentalist bent that is closest to AF. However, the punk aspect of Solarpunk, with its deep societal-economic divisions, evil mega and transnational corporations (often GN), is more easily noticeable in Latin-American and Latinx solarpunk, often shifting the focus from energy infrastructures to more direct politics. The extraction of human resources as energy is a common and poignant theme, utilised in works such as Brazilian writer Daniel I. Dutra's (2018) eco-horror "Gary Johnson". There, an apparently sustainable technology that promises to free the world from its reliance on oil is dependent on extracting energy from black people in a process that kills them. In Alex Rivera's (2008) film "*Sleep Dealer*", the border wall between the USA and Mexico hides the fact that the vast sustainable automation on USA soil is reliant on factories in Mexico: poor workers are worked to death running the automa-

tons in a form of cheap energy transfer with less economic costs.

Liu Cixin's (2009) short time-travel narrative "Moonlight", is one of the most striking recent works of energy futures, but its deep cynicism regarding the possibility of positive transformation, or even course correction, is hardly atypical of SF works from China (which is a major crude oil producer). In this short story, the protagonist is informed of possible futures by his future self via a phone call. The job of this future self is to pass on the knowledge that can prevent total climate catastrophe that has been the result of the current energy pathway (an old plot point in SF). Such knowledge, or blueprints, is of sustainable technologies including solar power and geoelectricity extraction, but each technology only mirrors the catastrophic effects of fossil fuel economies. While the whole narrative is framed as a quasi-bureaucratic problem, there is no critique of bureaucracy, but rather the futility of transforming energy infrastructures without a simultaneous attempt to change patterns of consumption that have brought about the catastrophe in the first place. Gulf- and Arabfuturist works are also often cynical towards the possibility of change, sometimes self-directed in terms of regional oil production and dependence, while in other cases due to the inability to imagine alternative futures that are free from such dependence. This is particularly true for the Gulf-futurist aesthetic, which in its original theorisation in the work of Sophia Al-Maria shared the general pessimism of Cyberpunk, but which also generally draws upon the structural wealth generated by oil economies as a template for imagining possible futures. Arabfuturist works are also deeply pessimistic, and oil reserves are more often seen as a bane rather than a blessing. In stories such as Diaa Jubaili's (2016) "The Worker", for instance, imagining a future Basra, different kinds of fossil fuel-based and renewable energy infrastructures are explored, but extreme pessimism regarding foreign corporate intervention and collusion with the sadistic political class of the country show the futility of any positive views of the future since the problem of energy infrastructures is not inherently tied to oil.

18.2.3 Health and Food

Within FF, health infrastructures are primarily connected to the modality of demographic change. These infrastructures have two primary concerns: disease management (usually infectious diseases alongside discussions of epidemics and pandemics) and treatment of ageing or young populations. Disease management, especially for infectious diseases, is generally presented in terms of mismanagement, which allows disease to spread rapidly and serves as a plot mover for generic doom and gloom narratives with some bleakly hopeful endings. Such narratives from the GS often emphasise the makeshift nature of healthcare infrastructures that are the result of strapped resources. Furthermore, they highlight the existence of multiple forms of treatment operating simultaneously, with bits and pieces of advanced technology often necessarily coexisting with traditional, localised, and/or indigenous medicine.

Of different themes that foreground health infrastructures within FF, epidemics, in particular, have been central to apocalyptic fiction where "killer viruses" and superbugs decimate the human planet (Dougherty 2001). Zombie apocalypses are based entirely on this myth, gaining popularity in the USA during the US Civil Rights movement, but mutating into the vocabularies of the 1970s and 1980s contagion narratives with Ebola and the AIDS panic (Luckhurst 2016). As early as 1986, such references seeped into scientific journals: an article in the Journal of the American Medical Association (JAMA) called the AIDS outbreak "Night of the Living Dead II", referencing G.A. Romero's cult classic from 1968 (Greenfield 1986). A future in peril, due to the invasion of foreign bodies, or because of aliens within, broke established social fabrics of the past, and replaced them with an ungovernable future with the omnipresent threat of contagion. The last decade brought about other visions, such as James Tiptree's (Alice Sheldon) (1974) "Last flight of Dr. Ain", registering the ecological emphases of the threat that reappeared in Terry Gilliam's (1995) "*Twelve Monkeys*". And yet that is not the only purpose of epidemics in popular

culture: many works also attempt to demonstrate global, unified responses to epidemic threats, such as Matt Leacock's (2007) "*Pandemic"* or Steven Soderbergh's (2011) "*Contagion"* using actual scientific vocabulary and teaching educational measures when dealing with infectious diseases.

While traditionally the contagion, infection, and epidemic narratives—including zombie narratives—are tied to fears of the outsider and diseased bodies, within GS FF these narratives have also been particularly useful for commentary on North-South relations, as well as within new futurisms from/about marginalised and disadvantaged voices from the GN (Chattopadhyay 2020). These new uses often invert the metaphors of contagion from class or ethnic perspectives in order to critique the use of disease metonymically to represent xenophobia and fear of the outsider. Such new uses, for instance in indigenous futurisms, as Cherie Dimaline's (2017) *Marrow Thieves*, o the Zombie horror film "*Blood Quantum"* (Barnaby 2019), or Elizabeth LaPensée's (2020) comic book "*They Come for Water"*, all present a world in which non-indigenous people are the only ones affected by specific diseases. In the first one, non-indigenous people have lost the ability to dream, in the second one they are zombies, while in the third one they are alien-mutated monsters. This theme is also present specifically in GS SF, which additionally deals with the concerns and fissures internal to such states, including religious or gender conflicts. For instance, two Indian narratives, Mainak Dhar's (2012) "*Zombiestan"* and Jugal Mody's (2012) "*Toke"* deal with zombie outbreaks and GS concerns, whether it is Islamisation or Corporatisation within a global capitalist system. A more recent movie from Bengal, "*Zombiesthaan"* (Ghosh 2019) takes on the theme of gender violence and misogyny. Ahmed Saadawi's (2013) "*Frankenstein in Baghdad"*, whilst not zombie-themed, nonetheless plays with the narrative of disease in the social body reflected in the body of the individual as part of that disturbed system. In an older but brilliant short piece, Manjula Padmanabhan's (1997) "Gandhi-toxin" presents a virus that turns people

into Gandhian pacificists but as a side effect turns them into revolutionaries bent on dismantling the structure of international finance, an outcome cheekily seen as deeply destructive and negative. A significant part of many such narratives is about infrastructural organisation, if not for treatment then for prevention and spread, including concerns on how to minimise risks of infection, processes of quarantine, etc. While they do not offer much when it comes to AF, they do externalise the relations of conflict that generate such toxicity in the first place, and thus can serve, if not as means to solutions, then as means to an analysis of structural disparities.

Another cluster of such narratives deals with disease and their treatment. The primary concern here is often about class distribution and access to healthcare services. Narratives such as the previously mentioned "*District 9"* (Blomkamp 2009) and "*Elysium"* (Blomkamp 2013) directly attach healthcare and class issues in a world that is the analogue of the GS. The latter film especially uses the reference point of Latinx/Latin@ futures, while the South African director of the former movie avoids being direct. Other narratives more strongly placed in GS frameworks, such as Tade Thompson's (2017) "*Rosewater"*, or Nnedi Okorafor's (2014) "*Lagoon"*, both based in Nigeria, also take on the theme of healthcare infrastructures but connect them to the larger planetary process of change wrought externally by colonialist adventurism, and internally by militarism and violence. In Thompson's narrative, the extraterrestrial alien biodome that serves as a hospital analogue with fungal architecture attributes has a high degree of unpredictability when it comes to treatment: even if its broad range of abilities include reanimating the dead and healing the sick and diseased, it can also mutate and mangle them. Thompson's narrative echoes numerous Black SF and afro/africanfuturist works that deal with medical themes and health infrastructures, but which are fundamentally about the state of sickness that pervades structural inequalities. Presenting futuristic technologies as advanced localised knowledge has a particularity within GS narratives presenting alternative systems of medicine and treatment.

Similarly, the treatment of health infrastructures as a planetary rather than localised bodily issue is a theme employed in narratives ranging from the wildly popular recent "*Black Panther*" (Coogler 2018) movie—set in the fictional African country Wakanda—as it does in slightly older Afrofuturist classics, such as Octavia Butler's (2012) "*Lilith's Brood*" (or Xenogenesis) book series. One common theme in such narratives as Xenogenesis is hybridity, which maps differential access to healthcare in relation to questions of ethnicity and race, and presents the only long-lasting possible solution being one that dismantles those dividing categories. Presenting health as a planetary issue also connects the modalities of demographic and climate change. Also present are more positive takes on the possibilities of advanced medical technologies such as, for instance, Wole Talabi's (2018) "When We Dream We Are Our God", which begins in Lagos but brings into its fold the whole planet, imagining the ultimate transcendence of humanity into a global collective consciousness via merging with AI, something that not only frees humanity from disease and ageing but even from bodily and psychological limitations.

Where such narratives deal with ageing, however, a more pertinent question is often the treatment of the old, and the relations between generations as a means to present or comment on healthcare issues. Stories such as Xia Jia's (2014) (the pseudonym of Wang Yao) "Tongtong's Summer" set in near-future China, or Fadi Zaghmout's (2014) "*Heaven on Earth*", set in 2090s Jordan, play extensively with the theme of medical and other infrastructures. Both narratives are meditations on the meaning of death. However, while "Tongtong's Summer" is set in a recognisable human world where robot-like, human-machine hybrid interfaces take on eldercare, Zaghmout imagines a Jordan where people can reverse and prevent ageing, which makes the human choice to die (taken by one character) seem particularly taboo. Importantly, neither of these narratives are truly dystopian since they do not go directly into questions of class-dependent access to healthcare and focus on the social consequences of socialised healthcare infrastructures.

Like health, food infrastructures are also closely connected to the modality of demographic change with an additional focus on climate change. Food infrastructures in GS FF are primarily about food security, especially in conditions of overpopulation, but often dealing with additional climate concerns such as flooding, desertification, or loss of arable land. Numerous GN narratives deal with issues of food scarcity in a heavily overpopulated world: "*Soylent Green*" (Fleischer 1973; Adapted from Harrison 1966) is an oft-cited classic example, but also narratives that echo the same concerns, such as the more recent "*Cloud Atlas*" (adapted from Mitchell 2004; Tykwer et al. 2012) (2012) that sets the same scene in a GS location. Food infrastructure also meshes with questions of waste and recycling infrastructure since wastage of food is of prime concern. Water scarcity and water pollution are also often brought up, for instance in the aforementioned "*They Come for Water*" (LaPensée 2020) and "*Mti Wakiwuli*" (Viswanath 2014), but especially in narratives dealing with the desert or desertification, such as the widely praised short film Pumzi (Kahiu 2009), set in future East Africa, or Jason Wishnow's (2014) "*The Sand Storm*" set in near-future China.

Another critically relevant theme is that of the effects of genetically modified (GM) crops, which have also been dubbed as "Frankenfood", whether on agriculture itself or on the sociopolitical landscape of GN or GS countries—for instance, in Paolo Bacigalupi's (2010) "*The Windup Girl*", set in twenty-third century Thailand. GS locations often become the focus of works by GN writers as a site where the present inequalities and possible futures can become a sharper focus. Examples include Bacigalupi's work, or Singaporean writer Vina Jie-Min Prasad's (2017) acclaimed Nebula and Hugo nominated short story, "A Series of Steaks", set in near-future Nanjing and dealing with the underground illegal food industry dealing with "authentic" artificial meat. Such narratives also generally fall within varieties of "punk" genres, including cyberpunk, steampunk, and biopunk,

which has long treated Asia and Africa in a techno-orientalist fashion as the accelerated future of contemporary hyper-capitalism, a trope played with and resisted in adoptions of such genres by GS authors (for examples see narratives in Goh 2015). Many GS narratives focus on GN adventurism via transnational corporations that often mix with local exploitative systems. For instance, Anil Menon's "*The Beast with Nine Billion Feet*" (2009), published in the same year as Bacigalupi's narrative, and set in 2040 India, focuses on transnational meddling with local agricultural practices and controlling local food production via GM seeds. The need to feed a large population (the 9 billion feet in the title refers to the global population) in a country like India mixes with the promises of the green revolution, which has always been an argument for GM crops. To that, the complexity of GS dependence for survival on the GN is added, which is foregrounded by the actions of transnational corporations such as Mother Earth in the novel.[16] Yet another narrative, the Vietnamese SF film "*Nước/Nuoc 2030*" (Nguyen-Vo 2014), shows a flooded future Vietnam where multinational corporations maintain strict agricultural control over vegetable production manufactured via genetic modification. As in Bacigalupi's and Menon's narrative, while the corporation is indisputably seen to be "evil" (a commonly utilised trope, especially since cyberpunk), the corporations can only act in concert with local systems that perpetuate the abuse, making the GN-GS connections explicit.

18.3   Conclusion

This chapter teased out some thematic explorations of different kinds of infrastructure discussed in contemporary GS FF. While all the different infrastructures necessarily connect with the three modalities of climate change, technological change and demographic change, the latter two

have been discussed in this chapter. The three modalities can be separated or clustered through their specific proximity to different sub-modalities. For instance, recycling, waste, and energy can be clustered in terms of technological change, since they deal with managerial forms of control, while health and food are more closely connected to demographic change since these are more closely, even immediately, connected to biological bodies. The third cluster, one that has been left out in this discussion due to space constraints, but which will be explored on its own in a separate forthcoming contribution, involves bureaucratic infrastructures that interface with the other two clusters. Bureaucratic infrastructures deal with border and identity infrastructures, mobility infrastructures, digital infrastructures including surveillance and social media, and habitat infrastructures. Infrastructures in this third cluster describe technicities integrated with the control of biological bodies.

The primary goal of this chapter has been to identify the broader pattern of spatiotemporal articulation that differentiates these new futurisms in terms of infrastructural concerns in distinction to what SF has done traditionally. These new futurisms are conditioned by several different concerns: (a) as a response to human concerns within futures articulated primarily as human futures; (b) as a response to human concerns related to contemporary planetary challenges primarily related to climate change, but which intersect with or manifest in terms of focus on technological change (including climate change mitigation or possible technological adaptation) or demographic change (including resource depletion or health problems accelerated by unchecked population growth); (c) as a response to contemporary structural inequalities that are distributed both in terms of GN-GS resource and infrastructure imbalance; (d) as a response to internal class and religiopolitical fractures within GS states, often connecting geopolitics with state politics; (e) as a response to the role of transnational corporations in perpetuating GN-GS imbalance.

While there exist vast differences between the conditions of different GS states, this chapter

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[16]For an excellent analysis of biotechnology and Indian SF, including in Menon's novel, see Suparno Banerjee (2015).

exhibits the loci where different local futurisms simultaneously address local and global concerns. In particular, these responses may also offer pathways to new imaginaries, especially since the conditions of the GN are often being seen as mirroring GS conditions in possible futures due to the same modalities, as well as offer ways of thinking beyond the simplicity of a genre framework of SF to more immediate strategies of FF as well as AF.

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