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New global tourism innovation in a post-coronavirus era

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ABSTRACT

World capitalism has become capitalism of abundance, but decadent capitalism. Today's capitalism is potentially destructive of the planet on which we live. This text seeks to highlight some of the irrationalities underlying this destructive potential, taking the relation between tourism and innovation as a paradigmatic example. The conceptual, political and operational articulation of tourism with innovation is not an easy task to accomplish, and there are many misunderstandings to block its desired symbiosis. It is also quite clear that innovation, namely that which is mediated and valued solely by market and economic and financial performance criteria, induces production and consumption that have contributed to climate change and levels of unsustainability of the planet. This text has three objectives: to requalify the role of innovation in capitalist society, to reconceptualize the relationship between tourism and innovation and to identify some challenges that will test this relationship in the post-COVID-19 era.

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1. Introduction

The evolution of life on earth is based on an elementary principle. The existence of life requires the consumption of energy that is not always available in the most appropriate ways in view of the needs of survival. Therefore, the creation of a model of energy production and consumption is a necessary condition for the existence of life and its proliferation. After several attempts, society has produced a model of energy extraction, production and consumption (EEPC) that has led us vertiginously to a scenario of climatic unsustainability and, therefore, economic, social and institutional unfeasibility. The current biological dimension of this unsustainability in Covid-19 is only one of its manifestations.

Historically, this EEPC model always involves some form of 'land grab' without it being possible to evaluate, unless it is too late, the impact on the planet's sustainability of the excessive valuation of private interests in the face of collective passions (Hirschman, 1977). The exploration and contemporary development of the tourism industry is one of the most paradigmatic cases of this general trend. Tourism, even before the

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COVID-19 pandemic, a true black swan (Taleb, 2007), was already under pressure, for economic, social and, the most difficult to hide, environmental, reasons. Despite having its distinctiveness, tourism comprises the fundamental time–space ‘distanciation’ of capitalism’s globalized ‘structuration’ (Giddens, 1984). However, due to its pervasiveness, we still propose to reconceptualize the concept of tourism in advance.

Accordingly, this article seeks to achieve two results, apparently asymmetric, but with a profound interdependence. First, it is intended to carry out a critical analysis of the way in which capitalism has been producing profound excesses for the economic, social and political unsustainability of the planet. The relation between tourism, innovation and sustainability is our lighthouse for analyzing a decadent abundance capitalism (Barzun, 2000). The second result is the development of the concept of ST.i, that is, a ‘territorial singularity’ fuelled by ‘territorial innovation’ and that allows innovation and tourism to be coherently integrated in a territorial framework. The relationship between tourism, diversified innovation and sustainability allows us to identify some levels of unsustainability and suggest ways to mitigate them. We piece together an alternative innovation platform for tourism that is ‘transversal’ in that it exists in real and imaginably sustainable form. It complies with the key characteristic of innovation which is its recombinant quality. It further enhances it by its drive to de-carbonize such innovation and implement a cognitively and practically sustainable alternative to the current and dated ‘steampunk’ model. We draw on relevant, sustainable industry and touristic practices and prospects from selected countries, but refer often to Portuguese needs, practices and conditions. This is because of its experience as a formerly hard-hit and fragile victim of past fiscal crisis in some need of an ‘anti-fragile’ touristic model (Taleb, 2012).

After this Introduction, the text is organized into three sections. In the first section, it is suggested that there is a fundamental aspect that differentiates the nature of economic and social crises, taking the twentieth century as a reference. In this context, it is argued that the innovation imperative has been playing the role of the global religion of capitalism and given its contribution to crises of excess, its role must be re-qualified. The second section deals with the reconceptualization of the relationship between tourism, innovation variety and sustainability. The common denominator of this relationship is identified and, based on its content, the concept of territorial singularity expands distinctive recombination to integrate tourism and innovation territorially. The aim is always seeking to mitigate various levels of global and local unsustainability. Finally, in the last section, by observing tourism dynamics in countries like Portugal in the last decade, a reflection is made about possible challenges that tourism will face and that innovation may help to confront. It ends with the conclusions.

2. Innovation is no longer what it was!

The nature of crises, before and after the twentieth century

The beginning of the twentieth century changed the nature of crises. Until that date, crises were essentially those of scarcity: shortages of resources, time, threat of famine, equipment, essential services and technology. Current crises are crises of excess in a society of unequal abundance in decline. Excess production, consumption, virtual and

anodyne needs, applications, empty innovations of vacuous economic and social significance. Naturally, inequalities have always existed, whether in times of crisis or abundance. The fundamental difference is that in times of crises of scarcity, inequalities were inevitable, because the volume of resources was insufficient in view of the basic needs of the population. Currently, the existing inequality can be called political inequality, since its existence is associated neither with scarcity of resources nor with the technological solutions available on the planet (MacPherson 1962). Not placing food and material needs above a threshold of decency is not an economic or technical impossibility, it is a political option.

We can start this brief narrative of the contemporary crisis by reference to a recent analytical portrayal of the emergence of the capitalist ‘engine’ as it transitioned from colonialism in the seventeenth century to full-blown imperialism in the nineteenth indicating where key contemporary tropes had their origins (Cooke, 2020c). Usually such transitions exploited in new forms the original advantage of the appropriated ‘land grab’ (Hechter, 1977). Accordingly, new industrial capitalists frequently assimilated to agro-touristic luxury lifestyles consisting in pastoral landscape for sublime contemplation founded upon aristocratic excess, commercial farming and animal-shooting for sport. An underclass of evicted tenants and subsistence smallholders formed an exploited service-class on great estates. The dispossessed surplus population was often paid by the dispossessing landlords with ‘assisted passages’ for emigration to colonial ‘possessions’. This was part of the ‘civilizing mission’ that had pervaded the classical education of colonial functionaries Catholic or Protestant.

Class society is thus the fundamental vitamin of economic expansion. Only the nature of the ‘land grabs’ it feeds from has shifted from the muscle-power of the exploited to their presumed ‘narcissism’ in this era of ‘attention’ capitalism (Franck, 2016). It has also been termed ‘surveillance’ society for the ubiquity of information’s ‘presence’ in society and data aggregators’ insatiable appetite for personal identification data. This, of course, is ‘data exhaust’ which acts as Google and Facebook’s ‘surplus’ rendered to advertisers to accumulate further wealth (Zuboff 2019). Definitionally, first, as Herbert Simon (1971) saw 50 years ago, ‘attention’ has the trait of scarcity (an economic value) but attention is also a basic human need (a psychological value). Commoditization of the psychological value by exploitation of the economic value of attention is the definition of ‘celebrity’. Second, attention takes on metric value in the form of concrete and comparable ‘currency’ units such as ‘likes’, ‘recommendations’, ‘follower’ ‘influencer’, ‘engager’ and so on, typical of social media rating algorithms in Facebook, Instagram, You Tube, etc. Third, being a celebrity is sufficient to earn an income from attention capital: attention breeds more attention. In this transactional landscape the equivalent of the stock exchange, banks and the financial system are the media. Fourth, and finally, as increasing amounts of attention are devoted to ‘auratic’ celebrity and consumption, so commoditization mutates into ‘brands’. This produces a new form of social inequality, between celebrities who receive a surplus of attention and those who get little attention. As we show later, this explains the addictive power of social media, which seduces its ‘influencers’ and ‘followers’ with this ongoing and ever-intensifying struggle for attention. In Portugal, the Douro region, once transformed into a British ‘fiefdom’ with the granting of monopoly rights to the fortified wine market for English Port wine merchants remains ‘auratic’. Simultaneously, still popular Madeira developed

Port wine techniques of distinctive fortification and a monopoly. This served first the Dutch then the British East India Companies. Thereafter, it spread to plantation markets such as Britain's North American, Caribbean and African possessions and Portugal's Brazilian and African colonies, amongst others. These were 'innovations' in mercantilism, monopoly and markets that fed the space-time distancing of auratic 'exoticism' and 'imperial grand tourism'.

Innovation imperative as capitalist global religion

The capacity for innovation is widely recognized as a main determinant of increased competitiveness of companies, regions and countries (Porter, 1985; Christensen & Lundvall, 2004; Tödtling & Trippel, 2005; Nunes & Lopes, 2015; Nunes et al., 2018; Nunes, Lopes & Fuller-Love, 2019). Interestingly, as innovation became a fundamental part of the development of polarized and 'decadent' society, it gradually lost its basic meaning, as process, product or service 'betterment', enhancement or social improvement and has become a kind of global religion, with associated reification, celebrification and adulation. Hence as addictiveness became a complement to the prevailing colonial imperative of 'discipline and punish' (Foucault, 1977) so obedience and quiescence became instruments for controlling the established social order of potentially turbulent slave, indentured or otherwise dependent but oppressed societies.

As an example of these concerns, see the concept of green innovation (Porter and Van der Linde, 1995; Aguilera-Caracuel and Ortiz-de-Mandojana, 2013; Tseng et al., 2013), social innovation (Westley, McGowan and Tjornbo, 2017; Domanski and Kaletka, 2019) and more recently the concept of responsible innovation or responsible innovation and research (Stilgoe, Owen, & Macnagten, 2013; von Schomberg, 2013; OECD, 2017; Cooke, 2019; Fisher, 2020a). The responsible innovation literature emphasizes a set of ethical values and behaviours that result from the relationship between technology, private and public policies and the governance modes associated. These approaches have also attempted to develop alternative pathways to innovation.

3. Tourism, innovation and sustainability

The main sustainability challenges of tourism

Sustainable tourism is defined by the UN World Tourism Organization (UNWTO, 2020a) as 'refer[ring] to the environmental, economic and socio-cultural aspects of tourism development. A suitable balance must be established between these three dimensions to guarantee its long-term sustainability.' Thus, it includes making sure that communities are being paid fairly and would include urban destinations where one might not automatically think of the need for environmental sustainability. The main challenges stem from the three pillars of sustainability pointed out by the UNWTO and can be associated with two types of externalities: global and difficult to attribute to a type of tourism and local/regional, with manifestations in economic and social terms. The former is related to the global movement, essentially by air, of tourists and impacts global environment change (Hall, 2009; Gössling et al., 2010; Scott et al., 2011; Gössling et al., 2015) through carbon dioxide emissions and related environmental effects. The latter have territorial

manifestations, such as inflation, real estate prices, loss of social networks, increased crime, undesirable behaviours towards local children (Moscardo and Murphy, 2014), overuse of local infrastructures (Shen et al., 2020), biosecurity issues (Hall, 2015) or urban and political transformations (Garcia-Ayllon, 2018). The two types of externalities are closely related and several solutions have been proposed. One which has not, concerns ‘post-auratic’ tourism. This is realized by addressing such externalities by the creation of a global scale for the territorial application of emerging technological innovations and solutions associated with local/regional scales. These two dimensions feed on each other, producing increasingly sustainable solutions with increasing territorial significance: environmentally sustainable, socially inclusive and economically shared.

The question of ‘Aura’ in aesthetics and the issue of ‘Auratic’ tourism

In what follows we will summarize the discontent, which was first seriously aired by Walter Benjamin (1973; first published, 1935) in his reflections on ‘The Work of Art in the Age of Mechanical Reproduction’. Benjamin considered ‘aura’ to be representative of a ‘cult image’.

‘The definition of the aura as a ‘unique phenomenon of a distance however close it may be’ represents nothing but the formulation of the cult value of the work of art in categories of space and time perception ... This is particularly apparent in the collector who always retains some traces of the fetishist and who, by owning the work of art, shares in its ritual power’ (Benjamin, 1973).

Benjamin explained how Marx’s critique of capitalist development showed what could be expected from it in the future, which would entail the exploitation of the proletariat with increasing intensity, but that this would create the conditions which would enable capital itself to be abolished. This is clearly a standard interpretation of the possibility of the overthrow of capitalism by the gathering force of the exploited proletariat. But not even Marx or Benjamin, his interpreter, foresaw or expected that capitalism would, by dint of the external environmental and pandemic conditions of late capitalist globalization, abolish itself (Cooke 2020d). This, arguably more or less temporarily, but with debts, furloughing and deep recession looming, is how the crisis could clearly evolve into a long emergency. The fact that tourists, rather than miners or steelworkers, were the direct cause of the current disruptions is a further irony of the spatial and temporal fates of prodigious proportions. For tourists were amongst most of the initial carriers of the SARS-CoV-2 virus.

Moving on and helping us towards our scenario of post-coronavirus tourism, we note Crang’s (2013) recalling of Don De Lillo’s (1985) novel *White Noise*, which features ‘The Most Photographed Barn in America’. The barn in question turns out to be a simulacrum (Baudrillard, 1994) that owes its ‘aura’ to being photographed by multitudes of tourists for whom it receives meaning from the very numbers of reproductions taken. It is in presentation of the ‘ideal’ image, the mass photographing of which creates the simulacrum (Allen & Handley, 2018). As they tautologize, ‘The implication is that it is simply photographed because it is famous; and famous because it is so frequently photographed’. This connects strikingly with the ‘frictional’ practices of ‘celebrification’ that characterize ‘the economy of attention’ in contemporary life, as discussed earlier.

The (territorial) nature of innovation

Neo-Schumpeterian (Schumpeter, 1942) innovation literature has advanced through multiple wide and diversified bifurcations (Nunes, 2012). Unaccountably though, ‘creative destruction’, which with a moment’s reflection has its apotheosis in contemporary global tourism, is seldom analysed as such. Yet it is a mere platitude to observe that the process of creating ‘territorial’ authenticity for tourists is complicit with the destruction of the ‘cultic image’ of authenticity that resides in the vacuum at the heart of markets (Galbraith, 1958). Accordingly, the territory is a result of complex interdependencies among the size of the market, the dynamics of interactions and a political-institutional framework favourable to economic and social achievements (Nunes and Sousa, 2020).

According to Camagni (1995: 319), the main components of innovative means include:

Smithian processes of division of labor between production units; Arrow learning-by-doing and by-using processes (...); Marshall or Allyn Young externalities (...); Schumpeterian entrepreneurship (...); and Chris Freeman’s cross-fertilization processes, generating incremental and integrated innovation systems.

After these works, other approaches have highlighted the role of territorial contexts in the innovation process (Nunes, 2012). In summary, the ‘territorial dimension of innovation’ leads us to the relevance of collective learning, relational and institutional proximity, informal relations and territorial networks supported by shared governance models. These mechanisms take us directly to the scope of the spatial embeddedness of innovation which clearly goes beyond a-spatial business and economic innovation. For our purposes, Table 1 shows the relationship between the role of territory and the mechanisms associated with its integration in the innovation process (first and second column).

The concept of tourism revisited: tourism as a territorial singularity fuelled by territorial innovation (ST.i)

Nunes and Sousa (2020: 30–36) argued that tourism should be circumscribed conceptually and politically through the concept of territorial singularity. Tourism is a sector

Table 1. Tourism as a ST.i.

Territorial innovation mechanisms	Territory dimensions	Territorial innovation model – Tourism as a ST.i		
Institutional proximity to governance Regulatory context, standards, social conventions Incentives & signs	Institutional	Governance Shared Model	Territorial Coherence	
Informal knowledge exchange Networks and explicit collaborations Labour mobility Marshallian Externalities Local business networks Firms interdependence – value chain Co-location of highly specialized firms	Relational and functional			
Co-location of specialized firms Co-location and technological proximity Location	Geographic			Perfect resources

Source: Own elaboration based on Nunes (2012); Nunes and Lopes (2015); Nunes and Sousa (2020) and Swann (2009: 149).

of the economy. However, like any other economic sector, it has specificities that condition interventions in its domain, be it public policy, business policy or innovation modes (Hjalager, 2010; Nordin & Hjalager, 2017). What is the main specificity of tourism, as an economic activity? It has been argued that its main specificity has been an absence of innovation, except for adaptation of organizational processes like on-line booking systems, or remoter hiking from elsewhere (Halkier, 2010). The main consequence is that tourism can configure a territorial singularity as a 'tourism region'. That is, it can configure a manifestation of economic ubiquity (production and consumption) in the same territory, based on a coherent, shared and desired integration of 'perfect resources' with 'territorial coherence' (Nunes & Sousa, 2020: 31–35). A perfect resource has seven characteristics: global scarcity; locally abundance: territorial control of the resource; territorial embeddedness; multiplier effects; use requires preservation (sustainability) and global demand. On the other hand, the territorial (geographical, economic and institutional) coherence results from the territorial articulation and integration of three components: governance models, knowledge bases and learning modes, and the regional economic and social structure that must be the object and subject of evolutionary dynamics. Therefore, a critical mass of actors, strategies and mechanisms that give territorial coherence to the transformation process of resources in an economically and socially realized manner should emerge. This is not, of course, a generic coherence; each territory builds its territorial coherence according to its objectives and the resources inherent in its pursuit, supported by a favourable social, institutional and political framework. This formulation is closely related to the principles of responsible innovation as well as the main referred sustainability challenges and gives the territory a role of friction in the face of global solutions that prey on the local social and economic environment.

Territorial singularities can be understood as the territorial (dynamic and evolutionary) counterpart of the concept of personal embeddedness (Polanyi, 1944) and internal to the organization (Granovetter, 1985) of tourism while absorbing Schumpeter's idea of innovation as 'new combinations' or Chris Freeman's 'cross-fertilization' innovation processes. Accordingly, the territorial singularity becomes the territorial innovation. As post-auratic innovation, it will lack 'authenticity' by being reproducible, but only in respect of its adherence to sustainability principles.

While past studies on innovation in tourism have tended to measure innovation in companies and focus on sectoral approaches, our proposal is that the territorial dynamics that contribute to the construction of the territorial singularity should be mostly developed within the scope of the spatial embeddedness of innovation. The territorial dimension of innovation associated is embodied in terms of the territorial mechanisms of innovation that, associated with the three dimensions of territory formulated earlier must allow the construction of the territorial singularity (third column of Table 1).

The conceptualization of tourism as *ST.i* has three very concrete advantages. Firstly, it allows for clearly identifying resources, processes, actors to achieve minimum thresholds for territorial competitiveness based on tourism. Secondly, *ST.i* is an intrinsically dynamic concept, constantly evolving and its construction cannot be dissociated from the territorial innovation processes that underlie the interdependence of its main components. Finally, this concept is not an immanently economic or disciplinary concept. With the strong link to the territory it is a concept that starts with economic activities but integrates several dimensions of sustainability so that tourism can play a relevant

role in the competitiveness and cohesion of a territory. The foundations of tourism as a combination of the spatial embeddedness of innovation with the territorial singularity can help a new understanding of innovation in tourism to overcome key sustainability challenges of tourism.

4. Possible futures and the future impossibility of the recent past

A new approach to innovation for the future of the planet

First, we consult some statistics that indicate the scale and nature of the problem by asking, first, how many tourists travel within and beyond their countries of origin annually; and, second, what human activities do they typically undertake while on vacation? The first question asks about total tourism while the second is interested only in vacation tourism. This is not to say business tourism is unimportant: to the contrary it is an enormous cost, quantity and planetary depredator as we show later. Accordingly, the answer to the first question is as follows. The United Nations World Tourism Organisation (UNWTO, 2020a) January estimate was that internationally there were just 25 million tourist arrivals in 1950, 68 years later (2018) this number had increased to 1.4 billion international arrivals per year. This is a 56-fold increase. In 2019, it was 1.5 billion but expected not to repeat its regular 6% growth rate even before taking the Covid-19 pandemic into account. But the first quarter 2020 results showed global tourism had actually declined by 22% and would more than likely decline by 60–80% annually compared to 2019s 1.5 billion. Bizarrely – from the viewpoint of this contribution’s perspective – UNWTO (2020b) declared the following in May: ‘This places millions of livelihoods at risk and threatens to roll back progress made in advancing the Sustainable Development Goals (SDGs)’. The first part of that judgement is true, but most observers would seriously question the second.

So, second what are the most popular pursuits undertaken by global tourists? The guilty secret of tourism is that one of the most popular tourist activities when they are on vacation is ‘going shopping’. While moderately passive tourism acts like ‘Sightseeing’, ‘Walking’ and ‘Eating’ are more popular, shopping at fourth (63% of survey respondents in World First’s survey in 2017) (World First, 2017) is a major tourist activity. It is more popular than: Sunbathing (52%); Reading (51%); Beach (50%); Swimming (48%); Historic Attractions (40%) and Museums (32%). Barcelona, as one of the most visited cities of the globe, has millions of tourist shoppers per year and suffers ‘tourist fatigue’ accordingly. Even Florence, another cultural destination, found to its surprise that its only two peripheral ‘designer outlets’ at Barberino and Regello, and city design museums of Florentine natives Gucci and Ferragamo, accounted for 6 million shopper visits, only 4 million fewer than visited its art galleries, churches and other attractions. Florence shopping tourists came predominantly from China, Russia and South Korea (Willan, 2018).

Two more forms of tourism are important to mention, as noted, each contributing prodigiously to climate change activity. In the first case, business tourism ‘events’ contribute audiences of up to many thousands at the peak, while sports tourism dwarfs the numbers of spectators contributing audiences of many tens of thousands, up to 100,000 at the peak. All of these ‘events’ generate tremendous demand for tourist

transportation, subsistence and accommodation on a global scale. The first is business tourism and the second not insignificant form concerns sports tourism. According to Littlefield (2016) there were 1.9 million global business conferences involving ten or more persons for a minimum of four hours in a contracted venue worldwide in 2016. There were 251,236,000 global business meeting participants in 2016. The estimate of the annual cost of such events is \$1.1 trillion. The industry employs some 25 million direct and indirect employees (Oxford Economics, 2018). At a glance, these show enormous and questionably necessary intangible aspects of the forms of global capitalism whose equally questionable and wasteful ‘innovations’ especially regarding travel and accommodation consumption support the assumption that so-called ‘innovation’ is global capitalism’s ‘religion’ or essential vitamin, otherwise ‘greed’. Thus, food and travel are the ‘dark’ twins contributing to the coronavirus outbreak. As is noted below some of the earliest diagnoses of coronavirus occurred at the World Military Games, which were held in Wuhan from October 18–27. Competitive sports are one of the main contributory forms of essentially unnecessary forms of travel that have accompanied the marketized logic of status or ‘brand’ ranking among social, military and medicalized inter alia associations that have come to prominence among civil society interest groups. In 2016–2017, 505 million spectators ‘consumed’ international sports events (GSI Report, 2017).

The ‘Gigafactory’ template for sustainable global tourism

So, now we know the nature of the spatial planning requirement to create an innovative new system and structure to transition global tourism at 1.5 billion visits away from unsustainable pollution, disease and climate change towards a new cleaner, renewable a sustainable future. The key is, putting it simply, to think big. A model already outlined for the reconfiguration of production geography (electric vehicle, batteries and solar storage systems) provides a template for adaptation from global production to global consumption crafted to promote the optimal mix of sustainable global touristic infrastructure and spatial planning superstructures. The model template is supplied by our ‘gigafactory’ and ‘sustainable capitalism’ analyses (Cooke, 2020a; 2020b). We begin with the – now fully realized – gigafactory exemplar. Through his Tesla EV car, truck, solar tile and panel, and lithium ion battery (LIB) platform, Elon Musk has innovated an integrated, transversal innovation platform architecture that has been combined with planned urban living quarters for 40,000 employees in relatively short order construction time. Starting with his first assembly ‘megafactory’ in Tilburg, The Netherlands, the deep structure of currently advanced sustainable spatial planning can be discerned. Built in 2013, it is intentionally located next to advantageous infrastructure on industrial land. This includes alignment with the Wilhelmina canal linking intermodal container barges with the Port of Rotterdam and high-quality transportation infrastructure. An excellent rail and motorway network connects Tilburg to all major EV markets in Europe, meaning parts and EVs can be distributed to anywhere across the continent within 12 h. The megafactory has a rooftop solar panel power station that supplies all the megafactory’s energy needs. It is the template for the first Tesla Gigafactory at Reno, Nevada (US), which at 15 million square feet is the biggest in the world. It is adjacent

to the Union Pacific Railroad that links other suppliers in Michigan and California to the Tesla assembly plant in Fremont. This has adaptively re-purposed the old GM-Toyota NUMMI plant for EV assembly. At Warm Springs, a suburb of Fremont, on old UPR railyards a new 'innovation district' featuring a 'Tesla campus' with an advanced manufacturing plant, an 'innovation cultivator' for technology start-ups in cleantech, life sciences and advanced manufacturing, has been built on 850 acres, centerpiece of a new Bay Area Rapid Transit interchange.

It is worth noting that cross-border gigafactory logistics integration centred on EV batteries is also the focus of the Freyr company's project in Norway. This aims to build a Gigafactory (1)-inspired, vertically integrated plant to start in 2021 with 2500–3000 jobs. It is connected to the Northvolt project in remote north Sweden (Skellefteå) to promote batteries and electromobility. The Norwegian Freyr renewable energy storage firm will build a 32 GWh Gigafactory as the first component of a potential 'Nordic Battery Belt' connecting Mo-i-Rana (Norway) – Skellefteå (Sweden) – to Vaasa in Finland (Ostrobothnia region's 'Lithium Province') for proximity to green energy, on the one hand, and LIB cathodes for future German EV automotive assembly, on the other. The Freyr Gigafactory is wholly powered by geothermal energy and a 600MW on-shore wind park. In Sweden Northvolt (1) has approval for building a 32 GWh Gigafactory at Skellefteå with VW and BMW as key investors and plans to build Northvolt (2) in a joint venture with VW at Salzgitter, near Wolfsburg in Lower Saxony, Germany in 2021 (Norberg, 2020). Finland's Rovaniemi theme-park on the Arctic Circle would benefit from thousands of high-paying jobs to boost its international tourism offer if augmented with Eden project-like geodesic 'biomes'.

Accordingly, transforming the production template into a suitable global tourism destination suggests thinking at comparable scale given 1.5 billion tourists require amenities, subsistence and accommodation among suitably large-scale facilities. Obviously, the passive 'Walking' 'Sightseeing' and 'Eating' activities are taken for granted, meaning 'Shopping' the fourth most popular activity must be catered for. This may combine browsing, actual fitting, and prêt a porter as well as click-and-collect purchasing, with in-store recycling an option. Sunbathing, Reading, Swimming and Beach-Lounging can be catered for by internal or external wave-machine bathing facilities. The 'epic' Tokyo 'Ocean Dome' wave pool was, until closed for financial reasons by owner Sheraton Hotels, capable of accommodating 6000 swimmers and surfers. The world's biggest lagoon-wavepool is in Tenerife, Canary Islands, Spain, at three metres (9.8 feet). We then have Historic Attractions and Museums to cater for. This calls into play augmented reality, gamification and immersive theatre, cinema, music and literature. Nowadays, recombination by crossover innovation has helped enable music and gaming aficionados to endure Covid-19 lockdowns by means of the following three 'event' types. First, 'virtual concerts' existed but in a post-Covid-19 videoscape, change was observable: thus Travis Scott (American vocalist) appeared performing a concert on the popular video game Fortnite, while Massive Attack (UK pop group) performed in the even more popular Lego videogame Minecraft. Ten years after Sweden's 'Fiber Optic Valley' (Hudiksvall) pioneers mounted a VR theatre drama in 'virtual' geographic space, New York's Metropolitan Opera House in May hosted a 'virtual gala' streamed together from performers' Zoom terminals (VINNOVA, 2011; Fisher, 2020). Shortly

after these ‘events’ consumer electronics giant Sony began recruiting a dedicated team to build large-scale virtual concerts. Second, Immersive Theatre and cinema, accompanied by immersive novel scripting, exist to bring audience participation to a new pitch through participating in the performances. Originated in Wales (UK) in 1981 by experimental theatre group Brith Gof, the tradition is followed up by Secret Cinema a company that combines film, theatre, music and art to create performative audience-engaging experiences. These have included the films *Back to the Future*, *Alien* and *Moulin Rouge* (Fisher 2020).

Our questioning of ‘auratic’ tourism is made flesh by a Victorian idea to display only reproductions. This would deactivate spectator fascination with the price rather than the aesthetic appreciation of the work. A modern curator community revived this idea, observing recent innovations in reproduction techniques recreated the artists’ intentions better than the faded, varnished and otherwise deteriorated original masterpieces. Other academicians noted that ‘aura’ is lost nowadays due to restrictive viewing conditions behind thick security glass or high-up hanging, while modern scanning showed truer, unfaded colours (Sanderson, 2020). The implication of this change of attitude is that whole galleries of approved copyrighted reproductions could themselves be reproduced and recombined for the 32% of tourists appreciative of museums housed in such post-auratic platforms of affordable, future tourism activity.

Finally, on planning lines implemented by Tesla, sustainable ‘global’ tourism facilities on a mammoth scale combining such tourism combinations can be envisaged occupying giga-buildings and estates sustainably serviced by planned support neighbourhoods. These to be designed on lines capable of providing variety and interest for the large numbers of employees to populate the service functions that still cannot be satisfactorily be met by AI-driven robots and systems. So, we can assume that this gigafactory-model is indeed ‘green’ in nearly every aspect. These solutions are ‘green innovation’ of a complex recombinant type and readily adaptable to global tourism platforms. This adaptation will be more efficient the more it is carried out through the structural principles of the territorial-singularity model presented (Cooke, 2020a). Accordingly, having described the recombined, crossover innovation platform for post global tourism of a sustainable kind and to show that it exists putatively but has yet to be fully realized, we turn for a term and concept that captures what is being proposed. For initial inspiration, we refer to New York’s The Shed at Hudson Yards. This is a new cultural centre which commissions, produces and presents a wide range of activities in performing arts, visual arts and pop culture. Built, like Warm Springs, over rezoned railyard land, The Shed is a 170,000 sq. ft. (16,000 m. sq.) complex built on a 26-acre industrial site. Combining the concept of ‘Giga’ and ‘Shed’ gives us GigaSheds as descriptors for the large-scale seeding of (pandemic-secure) post-global tourism, post-auratic, yet ‘photographable’ icons of future mass leisure consumption, as planned for Neom’s tourism ‘giga project’ in Saudi Arabia (Rose, 2020). Unlike the New York exemplar, it would be apposite to site such very large installations on remoter modal interchanges for EV tram or trunk railway lines running on battery or mains electric renewable energy, serviced by EV aeronautics, where feasible, EV taxis or rental guided cars with amenities serviced by Tesla-type semi-trucks.

Innovation in tourism in Portugal in the last decade: excesses of an innovation model of the type 'institutional push-serendipity pull'

Portugal has recently advanced its reputation as an international tourism destination. Important in this is an innovation model that we can call institutional push-serendipity pull. Innovative governance stimulated first, external, later, internal demand met by viable tourism business investments. This two-phase model has distinctive dynamics: an institutional impulse that generates new demand and a dynamic of supply that allows exploitation of such new effective demand. The driving force behind tourism innovation in Portugal at its most dynamic time was the political-institutional factor (Figure 1), and this fact is not irrelevant to the Portuguese economic and social position in the post-COVID19 era.

We seek now briefly to switch context attention towards the current global medical emergency caused by the coronavirus and its consequent Covid19 disease. At this writing (27 October 2020), Covid-19 has killed 1,159,708 persons globally. The precise origin of this lethal virus is unknown, but the predominant view is that it originated like many other similar viruses, in China. Specifically, most experts locate its origin in the city of Wuhan but some place it closer to Shenzhen or Guangzhou. The first officially identified case in Wuhan dates from November 17. However, Sage (2020b) reported that French athletes caught it in Wuhan when they were competing in the World Military Games, which were held there from October 18–27. So what the French athletes caught was an already circulating coronavirus in Wuhan on October 2019, earlier than its official detection date. Thereafter, a French contractor Technip, hired to test China's first BSL4 lab at Wuhan for medical security refused to do so,

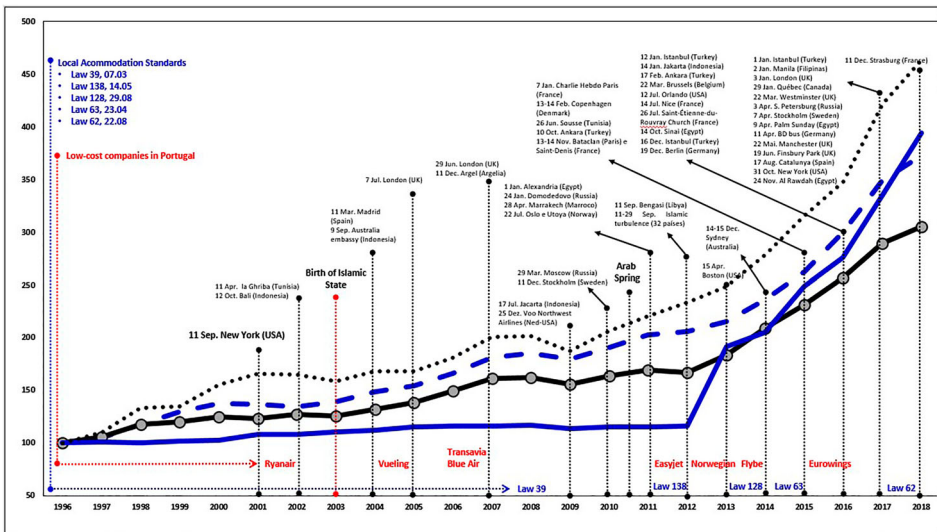


Figure 1. Booms & Illusions (1996 = 100; Portugal). Source: Own elaboration (March 2020). Legend: dashed line: Air Traffic; black-point line: Guests; black line - Accommodations; dot line - Tourism Exports. In the Graph: terrorists attacks since September 11; Low cost airlines in Portugal & Local Accommodation Standards.

resulting in the departure of 50 overseas technical experts in fatal pathogen research. Oddly, the Wuhan Lab director's media assertion that a leak of the pathogen was 'impossible' invited further scrutiny (Sage, 2020a). China's National Health Commission later denied a leak from the Wuhan Institute of Virology (WIV) but announced further tightening of safety requirements, training on data security and stricter accountability on biosecurity management. A WIV virologist, Shi Zhengli, nicknamed 'Bat Woman', confirmed to Scientific American (Qiu, 2020) that the SARS-CoV-2 genome analysed by polymerase chain reaction originated in a horseshoe bat cave in Kunming, Yunnan province, a thousand miles from Wuhan, where Shi had discovered it.

As a coda to this disquisition on the relationships among climate change, biodiversity and globalization we quote Italian observer Paolo Giordano, who adheres to the theory that SARS-CoV-2 originated in the 'wet market' in Wuhan, where live animals were sold until it was closed by the Chinese authorities. Eco-disasters, like wild bush fires or rain-forest felling create 'ecosystem refugees' among viruses losing their hosts from such mass-extinction events; namely, animals, birds and insects. So the microbes seek new hosts among increasingly proximate candidates – human beings. A further example concerns deforestation which also reduces the abundance of fruit. Fruit bats host the ebola virus which may transfer to gorillas also in search of a diminished supply of forest fruit. Gorillas pass ebola to humans. Climate change stimulates other diseases such as malaria, dengue fever, cholera, Lyme disease and West Nile virus. Travel and food, once again, invoke the necessity severely to control our mobility consumption as it affects the complex chains of geographical interaction human agents exert on the world. Giordano also noted how Italian media processed information by means of 'fake news', manipulating infection data by lowering or inflating total cases, deaths or testing claims, as happened daily in the UK and probably elsewhere. Accordingly, 'truth' is distorted in relation to errors and hyperbole invoked to cover up or celebrate dysfunctional relationships and policies towards the environment and disease (Giordano, 2020; Odell, 2020).

Some multicoloured experiences: from Bukubaki to Bluestone

Nowadays, it is possible to make a booking designed on ecological principles to reduce polluting impacts of tourism in the chosen destination. For example, eco-resorts exist with sustainable and recycled materials, enhanced water conservation and energy-efficient lighting. Choosing these accommodations, instead of traditional hotels, selecting these reduces tourist ecological footprint, gives opportunity to connect with nature as well as enjoying distinctive tourism activities. Here are some examples.

Cocoon Eco Design Lodges in Comporta combines the possibility of a beach vacation without giving up the countryside. Concrete-free sustainably-built huts on wooden piles and unpaved road access prevail. It has a biological pool, a tree house, a Moroccan tent, a vegetable garden and an extensive wild forest. The eco-designed lodges have large windows to the outside and private decks, making engagement with nature easy.

Cordeira – Home for Creativity is located near Lousã. It is integrated into the Schist Villages network where once 30 years ago there was no water or light. Not a single inhabitant lives there now; the only two streets in this village are effectively occupied mainly by the nine schist houses intended for accommodation. Outside, they remain untouched,

with stone facades. In the interior, despite the modern decoration, they preserve the original stone, clay and pine floors.

At Casa Vale da Lama, in Lagos, there is no Wi-Fi in the rooms or TVs. The floor-to-ceiling glass doors are the only available 'canvas', overlooking the gardens, where flowers grow. The resident can also access hammocks available on all terraces, with direction to the outdoor pool. In the kitchen, the farm's products – along with other locally produced ingredients, mostly seasonal and organic – are transformed into Mediterranean buffets.

At Pedras Salgadas, located in Vila Pouca de Aguiar, there are three houses, located in natural settings with abundant fresh air. This ecological hotel project has also included eco-houses, located in the heart of the natural park, among centenary trees and colourful vegetation. An immersive experience includes entering various hot springs in the park (which contain water with proven transdermal benefits for the body) and eight kilometres of paths.

Bukubaki in Ferrel, combines the surfing lifestyle with ecological glamping, promoting awareness of nature. The wooden houses are equipped with ECO heating; the Canadian tents are made of waterproofed cotton, protected by an extra cover and erected on a wooden deck. To eat, Juncal n.6 combines the best of the flavours of the sea and local organic agriculture. There is also a salt-water pool, heated by solar panels and the activity area, with an outdoor deck for yoga, pilates, therapeutic stretching exercises and surf balance.

Tourist accommodation could combine exemplars like Martinhal in the Western Algarve, Portugal, a largely sustainable hotel-resort in a formerly damaged (historic piracy by Francis Drake and successive earthquakes in Sagres) reconversion area. The hotel uses mainly solar energy, has a strict sustainable food philosophy using local ingredients and has kept many of the local wooded areas intact although local timber, cane, stone and cork are used in construction. Martinhal has created 250 direct jobs (95% of the staff are local) and another 250 indirect jobs to suppliers, local shops and bars.

As a complementary alternative to this eco-resort in Algarve, Bluestone, in Preseli (Pembrokeshire), Wales is sustainably built, fuelled and provisioned by 50 farms with locally sourced organic food, a fuel network of local growers of crops-for-fuel (willow) and construction timber but currently lacking only sufficiently sustainable transportation infrastructure. Bluestone's tourist development includes some 340 timber chalets surrounding a 'Celtic Village' of 80 permanent buildings within the coastal National Park. Outside the park, it is integrated with an existing leisure centre extending it with the inclusion of a Snow Dome, Waterworld and sports centre. The development was valued when opened in 2008 at some £60 million. Preseli district is the unique home to the 'bluestones' that comprise the celebrated Neolithic monument and World Heritage Site of Stonehenge. The Bluestone philosophy 'is care and enhancement of the environment'. Committed to sustainability the company attained the highest environmental accreditation in Europe, ISO 14001 and Level 5 of Wales' Green Dragon Environmental Scheme.

Accordingly, templates for recombination exist for connectivity, crossover innovation and integration of much bigger 'GigaSheds' despite scaling the biggest tourism innovation platform yet imagined. The cost will – under capitalism – no doubt attracts public subsidies and corporate sponsorship of the kind that The

Shed attracted (e.g. Allianz, Mitsui, Wells Fargo and Deutsche Bank, inter alia). Furthermore, the global Insurance market is also expected to be hit by claims amounting to \$200 billion (\$4.3 bn. for Lloyds of London alone) over the Covid-19 pandemic; meanwhile quantitative easing with some corporate negative interest being charged globally on loans and mortgages, which have never been cheaper (Martin, 2020).

5. Conclusions

Although the current pandemic is expected to fade progressively, the challenges that this dynamic highlighted already existed and viral evolution will remain in the future if nothing is done in mitigation. The new role that innovation should play soon was discussed, politically and financially oriented towards objectives other than those that have guided it in recent decades. Sustainable and more parsimonious goals have been envisaged and partly experienced allowing citizens to live in a different world. To engage with this, tourism has been reconceptualized in this contribution, creating a more cohesive and eventually competitive escape from ‘carbon lock-in’ (Unruh, 2000) because it is also territorially differentiated. Importantly, a new concept was presented – *ST.i* – which seeks the coherent and consistent integration of tourism with innovation. The way in which the main pillars of this text were presented and articulated (territory, territorial dimension of innovation, territorial-singularity model for innovation in tourism) as well as the proposed solutions give the territory, namely in its relational and political-institutional functions, the responsibility and the opportunity to design mechanisms that act as moderators of the capitalist forces that have been criticized in this text. The top-down actions underlying global capitalism do not find fertile ground to develop because that space is occupied by endogenous solutions territorially built, according to principles of sustainability and responsible innovation. Yet choices still have to be made since as yet it is hardly possible to build *ST.i* in all territories, even with seemingly endless corporate and governmental resources still constraining political choices. But the *ST.i* lesson stresses the model of governance conditioning responsible choices and innovators producing focused, sustainable innovation, yielding better tourism in response to such more lucid and courageous policy options.

Partnership between governance mechanisms, communities and engaged business corporations are the vehicle for post-auratic global tourism of the kind we have described. Giga-Shed is designed to re-track global tourism on a new, more sustainable, diverse and differentiated path. It does not aim to ‘shut down’ but gradually moderate the destruction of currently perceived as ‘authentic’ tourist sites and attractions that have become increasingly de-natured. It promotes the implementation of new, more sustainable forms of ‘crossover’ innovation in a field that has for long been shown to be sadly lacking that quality. For older ‘woke’ tourism consumers, GigaSheds can provide a large-scale but accessible mix of vacation experiences designed for de-carbonized enjoyment. For younger generations, there is a set of global dynamics that seem inevitable. The most environmentally attentive see them mainly in the sense of uncontrollable forces while for the least attentive they may simply seem to be available as if acquired by natural, almost divine right. There is something new for both. All dynamics were the result of political choices (see, for example, Chang, 2013, on

globalization). The resulting catastrophe in which we live has clarified this evidence for us: we have choices, but choices have consequences. Involuntarily, but not on purpose, COVID19 put the world on an effective path to combat climate change, a way that no politician has ever had the courage to make publicly explicit. We also know that we do not want a world without gravity like the current one, but we must learn how to build a new 'gravity' where the excesses of the past will be eroded and cannot any longer take place.

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