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Dockworkers and the creations of synergistic pathways for a sustainable port city

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Abstract

21st century cities are seeking sustainable measures to mitigate environmental impacts. As complex, adaptive systems, cities share challenges and engage their communities in actions and policies to foster more sustainable results. In port cities, this creative collaboration must be constructed with the participation of the urban port and the port community. Our goal is to use a synergistic approach to understand the interplay of stakeholders in port cities, especially the role dockworkers play in making it more sustainable. Our methodology involves a combination of secondary analysis, participant observation, interviews, and questionnaires directed at dockworkers and representatives of governing institutions in the ports of Vancouver/Canada and Vitoria/Brazil. Dockworkers are, from this point of view, a key stakeholder to green both the port and cities of Vancouver and Vitoria.

Introduction

Cities can be understood as complex, adaptive systems in which industry, commerce, and urban social, cultural, and political life coexist in a competitive and collaborative relationship which evolves over time. In response to the environmental damage incurred since the dawn of industrial development, 21st century cities are seeking ‘greening’ or eco-sustainable (hereafter referred to as either green or sustainable) measures to mitigate the effects of climate change, pollution, natural resource consumption, and a transition to an “after oil” economy while also balancing the mobility, welfare and security of their citizens (Morel et al, 2013). Situated at the core locations within international trading systems, port city governments, port authorities, and the workers within ports each play a pivotal role in responding to the pressure to mitigate their environmental impacts.

An integrated perspective, or synergistic model of local economic development, based on creative collaboration, social learning, and shared intelligence may provide a balance between these three roles which can encourage innovation, growth, and interaction between the city and port. In this paper we examine the port city using a synergistic approach, showing the port as a complex, inter-connected and relational system where different stakeholders interact and collaborate with each other. Dockworkers, specifically, are stakeholders who hold a unique position to shape the geographies of the port, drawing on the culture and
history of the dock as a place of work, and the port-city as their home. We seek to emphasize the role
dockworkers play in shaping the waterfront specifically in regards to sustainability practise, while also
examining the impact of dockworkers on the cities which surround them.

We achieve this by applying the synergistic approach as laid out by Ravetz (2014) to the social meaning
and role of dock work, drawing on the port cities of Vitoria, Brazil, and Vancouver, Canada for examples. In
this dialectical study we further consider literature which points to port workers as agents creating port
geography and culture. Our methodology involves a combination of secondary analysis, participant
observation, interviews, and questionnaires directed to dockworkers and representatives of governing
institutions in the port. We have found that while inherited culture still drives some of the dockworker’s
environmental behaviours at the port, the administrative authority of the port as well as the bodies governing
dock work- Orgão Gestor de Mão de Obra (OGMO) in Brazil, and the British Columbia Marine Employers
Association (BCMEA) and the International Longshore and Warehouse Unions (ILWU) in Canada - play a
fundamental role in providing dockworkers with the environmental knowledge to change their behaviour
both inside the port and in the city beyond. Dockworkers are, from this point of view, a key stakeholder to
green the port. Their engagement and participation in port sustainability policies indicate a relationship
between the authorities and workers that remains a work in progress.

**Synergistic pathway development**

In an effort to participate in a competitive global economy while seeking sustainable development, cities and
ports must invest in organizational efficiencies, using creativity and innovation to generate economic wealth
through new circuits of value creation (Girard, 2013). Port cities can launch a smart and sustainable
development model which can tackle these joint challenges. In fact, there is a growing imperative for a new
mutual environmental commitment between city and port (Hoyle, 1999; Boschken, 2013) just as municipal
and regional governments can play an important role in implementing sustainable development policies
(Debrie & Raimbault, 2016) so also can port authorities and dockworkers. This mutual commitment,
however, requires an appreciation of the connections between waterfront work and the city.

It is well understood that changes in the technologies, locations, scale and governance of port operations
have contributed to a disconnection of port from city (Hoyle, 1999; Hall, 2007). In port cities, as elsewhere,
citizen-consumers have lost an understanding of their reliance on port functions, and the waterfront is now
understood as a non-work place. The greening which is typically proposed for the new waterfront is relatively
superficial - it is about making the place nice for leisure and consumption, without considering the impacts
of that consumption across the globe, but also in the nearby industrial waterfront.

These disconnects between the industrial use and consumption of the waterfront are characteristic of the
Post-Industrial city, as described by Ravetz (2014). This model, while utopian in its vision, is useful for
thinking about how broken relationships and (mis)understandings can be re-created in ways that stimulate
innovative responses, and specifically, how dockworkers can serve as a vital link in this stimulation. Ravetz
lays out three types of cities, along with ways of understanding them.

In the Industrial City 1.0 we find a linear understanding of the city; Ravetz, seeing how Wallerstein’s World
Systems Theory impacts cities, highlights the positive values which are extracted from the periphery while
wealth and power are amassed by the elite at the core. In an industrial city 1.0 workers are seen as a link
within a commodity chain of production where value is expropriated (Bonacich & Wilson, 2008; Gereffi,
2014) the owners and employers hold all of the power, and union movements are mostly ineffective. In this
City, dockworkers are expendable, either through replacement with other workers, or by-passable all together through the use of differing trade routes, which can lead to a separation of work and meaning.

In a Post-Industrial City 2.0, we begin to see value clusters, where decentralization leads to the reinforcement of the elite while externalities are displaced towards the periphery. We begin to see the value added at each step in the commodity chain, however workers continue to be seen largely from an economic standpoint as merely a link in the commodity chain. Where separation between work and meaning began to occur in an Industrial city 1.0, in a Post-Industrial City 2.0 the process of devolution undermines the worker and any value the worker may bring. Within the city, an understanding of the waterfront as an important link in accessing the goods and commodities consumed by the cities, waterfront communities fragment, and identities based on waterfront work are lost.

In Intelligent City 3.0, which for Ravetz (2014) is the most advanced level, linearality is removed, and value systems are built on synergistic interaction between all stakeholders. Value is continually recirculated from the core to the periphery and secondary cores are created within the periphery. Connections, or pathways, between nodes of value creation are recognized, separating the Intelligent City 3.0 from its predecessors. From an economic point of view, this idealized city sees wealth circulating through communities, as opposed to moving away from the masses towards the elite, and new forms of value are continuously created. Workers become a pathway to innovation and value creation, and thus are able to move away from the insecurity which accompanies the ‘work as a commodity’ that is typical of the earlier generations of cities. Presently, cities worldwide tend to fit either into one of the first two categories, or more likely, hold elements of each. Steps towards Intelligent Cities are being made, but we are far from realizing this type of city in its idealized manner. Further, while theoretically cities can be labeled into one of these three categories, in reality there is rarely a clear line that can be drawn to definitively classify a city.

This lack of distinct boundaries exemplifies one of the weaknesses in using this model. Due to the nature of development, not all areas are able to develop towards an Intelligent City 3.0 simultaneously. Indeed, forward movement between a Post-Industrial City 2.0 and an Intelligent City 3.0 requires a reorganization of the city in terms of social and business interactions, and further, restriction and reconstructing the current economic system to incorporate these interactions. It is possible, and perhaps likely, that as the transition to an Intelligent City 3.0 unfolds, we may find that this type of city is quite different than how we presently imagine it. While not all areas are able to develop towards a 3.0 city simultaneously, integrating voices can be achieved regardless of the current development of the city.

**Synergies in city and port greening: dockworkers as a pathway**

Citizens worldwide have joined together in a call for more sustainable products and product delivery in response to a growing awareness of the effects supply chain activities on global warming. This creates localized pressures and responses which have ultimately led to a set of outcomes that are shared across a wide variety of both cities and ports. The number of ports adopting the “green port” mentality is growing as port authorities and terminal operators invest in new technologies and measures to mitigate their environmental impacts. These measures indicate a perception shift from that of sustainability as a legal obligation to that of sustainability as an important economic driver. Wang et al. (2007) note that maritime firms, both port and vessel operators, have moved towards adopting sustainability in an attempt to gain a competitive edge.

The greening of the port in the practices and procedures of the port, is based on overwhelming evidence that maritime trading is highly linked to climate-changing pollution, and the negative externalities associated
with it (Chang & Wang, 2012; Hall, 2010; McArthur & Osland, 2013; Han, 2010). As global communities become increasingly aware of the need to use greener energy methods (Ng & Liu, 2010), social and community pressures to green the port continue to grow, encouraging ports to implement greener practices in four key areas—air pollution, greenhouse gas emissions, coastline damage, and terminal activities (Hall, 2007).

As members of both the community and the workplace, dockworkers hold a unique position to understand and influence change in the environmental area. Dockworkers may play a role in creating the cooperative pathways required for the evolution of a city towards and Intelligent City 3.0. While they feel the negative effects which come with the worldwide transferring of goods, they also rely on this transfer to support themselves and their families. Global trade of goods inherently brings with it not only the negative externalities of the maritime shipping industries, but also the movement of goods which may cause environmental damage during extraction, processing, or even after the consumer has discarded of the good following its use. In all of these cases, there may be strong kick-back, resistance, or even protesting against the goods by concerned citizens or watchdog groups.

In a 3.0 City, potential process improvements due to the skills and knowledge of dockworkers would be incorporated as an important pathway. Ravetz (2014) stresses the importance of beginning with the current state of development, summarizing Wang (2007) and Ng et al. (2014), noting current stresses such as the growing detachment between the city and port-related infrastructure, the environmental impacts - and environmental vulnerabilities - of port operations, and physical barriers caused by obsolete infrastructures. Ravetz further points to external pressures of globalisation, liberalisation, modernisation and capital on port city functions as well as internal pressures such as economic restructuring, demographics, and cultural change. These pressures combine to create the linear effects of an Industrial City 1.0

In this city, the culture of dock work is largely overlooked as low-class and unimportant, with dockworkers held in traditional arm’s length, rule-bound relationships with management. They are seen as unskilled labourers, un-capable of innovation. Their investment capital is overlooked, and the economic contributions they bring to the local economy go unnoticed. However, dockworkers are closely connected to the specific communities in which they live, and households within this area perpetuate a culture of dock work with a sense of pride over the work which is otherwise relatively isolated from a wider society. As dominant urban polities do not share links with waterfront work, and the importance of the port in providing access to nearly all the city’s consumables is misunderstood and masked.

When innovation, economic growth and globalisation impact the city, focus shifts towards value-added and value chains over commodity chains resulting in the transition into a Post-Industrial City 2.0. Value is extracted in search of short term profits, and heritage becomes a commodity to be sold to tourists. Museum displays, books and events draw tourists to the water while spatial changes and gentrification pull waterfront workers away from their workplaces. Industrial work, and, indeed, an understanding of the waterfront as a place of work is displaced (Hall & Stern, 2015). Devolution occurs, moving governance away from state and towards private owners, undermining worker positions, fragmenting dockworker communities, and weakening the identities and personal connections between the waterfront and the worker. As waterfront culture changes the on-call nature of the work, which was formerly accepted and encouraged through the intergenerational passing of dock work culture, this work loses its acceptability in society lending to an attitude of undesirability towards dock work. In addition to the economic benefits found in a Post-Industrial City 2.0, the cultural shift allows for the breakage of gender divides, and introduces organized training. While this training is aimed at maximizing efficiencies in the waterfront, a strong focus on waterfront safety is also established through improved equipment and procedures. Citing safety and security concerns, particularly in a post 9-11 world, infrastructure designed to maximize profit and efficiency further separates the city and
Increased security measures result in regulations regarding the commodities moved through the port, however responsibility for any potential environmental damage due to the use of the products moved is deflected with the ideology that the port is simply a through-put with no impact on what is shipped. New technologies ease both the movement of this discretionary cargo (Jaffee, 2010) and the physical burden of dockworker, and new service jobs arise. Workers, however, view these new positions as inferior jobs rather than promising career building occupations. While linearity is replaced with value clusters, the importance of the individual continues to be disregarded and the potential benefits of cooperation with dockworkers goes unheeded.

The “networked, inclusive, creative, responsive, multi-valued, intelligent and self-organising” (Ravetz, 2014, p. 376) Intelligent City 3.0 creates a synergistic city where pathways of local integration become an essential part of the economic system. Rather than selling heritage as a commodity its value in shaping both the waterfront and surrounding cities is recognized, and the labour of dock work leaves its former ‘dirty’ and ‘undesirable’ images behind as it becomes integrated as a community asset. The voices of dockworkers are sought for their ability to draw on their unique experiences as a bridge between waterfront work and the community in both creating value and in enhancing and enabling new technologies. This stimulates appreciations of the waterfront as a place of shared interests, that is, as a site which provides residential, commercial and industrial value. New social patterns arise where the culture of dock work is reinvented to embrace and eliminate some divides between city and port. This focus on pathways enables the reduction of frictions caused by the environmental damage which occurs during port operations. This is further reflected in new dock work training modules which draw on information passed down from upper management, but also information gathered from a bottom-up approach to maximize the benefits of training. Infrastructure is designed to encourage this collaboration and encourage interaction between the port and the city as a method of increasing understanding between the two. Any tourism that does occur focuses on building awareness and interaction along these important pathways. As port and city interacts, an active role is taken in encouraging sustainability both within the port jurisdiction and in the products which move through the port, sharing both the benefits and responsibilities of port and city greening. A balance is also achieved in terms of the financial profits acquired through trade, with revenues dispersed to the dock workers, state, and international funders. Capital is reinvested into port systems to optimize benefits for all stakeholders, including environmental and community interests, resulting in an accumulation of shared knowledge, skills, and ultimately, value.

Dockworker agency in the Ports of Vitoria and Vancouver

The Port of Vitoria is located on the Brazilian coast, in the Espírito Santo province, some 500 km north of Rio de Janeiro. Its history dates back to 1551, when the small individual colonial docks spread across the Bay of Vitoria and laid down the local maritime transportation tradition. By the 20th century, the port had become one of the key public ports in Brazil. The Port of Vitoria occupies an urban area in two municipalities along both sides of the bay – Vitoria and Vila Velha. In Vitoria, it is situated in the city’s physical and economic “centro”, or downtown. In addition to the people who reside near the port, this area also sees a significant volume of vehicles which commute between the neighboring municipalities of Vitoria, Cariacica and Vila Velha, and is situated near the state government headquarters at Palacio Anchieta, which lends local political and historical importance to the area.

The Port of Vancouver is quite different from the Port of Vitoria. Despite its relative youth, the Port of Vancouver has expanded to become Canada’s busiest port, and the third busiest port on the west coast of North America. The Port Authority in Vancouver established through the merger of three regional port authorities in 2008 (POV, 2016), is responsible for managing approximately 350 kilometers of shoreline,
16,000 hectares of water and more than 1,000 hectares of land bordering 16 municipalities (POV, 2016). While the Port of Vancouver covers a much greater area, one section within the Port Authority’s jurisdiction mirrors Vitoria. The Burrard inlet, which separates the cities of Vancouver and North Vancouver, hosts 16 of the port’s terminals in immediate proximity to a dense concentration of residential and commercial activities.

Both ports, then, face the challenges of meeting the needs of the urban populations surround them as well as the need to remain competitive in an international market. Practices to reduce environmental damage, however, are not consistent across ports, and thus what occurs at the Port of Vitoria or the Port of Vancouver differs dramatically.

Environmental lines of action for the Port of Vitoria occur following Brazilian law and is supervised and even conducted with the provincial environmental body (Instituto Estadual de Meio Ambiente/IEMA). There is a network to monitor air quality, managed by IEMA, where several local companies contribute financially to its maintenance. Other actions done in order to fulfill the conditions required by IEMA, include the requirement for a canvas to be placed at the side of the ship during terminal activities in bulk solids operations, the requirement to maintain the roads during and after operation, including collection and disposal of waste as well as sweeping and wetting the roads. Individual Emergency Plans for oil spills are required at each port (Vianna, 2009), and there is a project across the port to improve the collection and disposal of waste. Additionally, environmental monitoring of water and sediments to control levels of bioaccumulation both of heavy metals and aquatic biota is required (Rodriguez, 2016; Vasconcelos, 2014).

In Canada, the Port of Vancouver, sits as a leader among national ports in their efforts and successes in greening the port across each of the four areas of environmental focus. It is the third west-coast port to offer cold-ironing- or shoreside power- to cruise ships in an effort to combat air pollution (Hall, O’Brien & Woudsma, 2013). Vancouver has been operating this technology since 2009, following in the footsteps of the ports of Seattle and Juneau (Silverstein, 2011). Plans to offer shoreside power to container ships at two berths have been released, with construction starting in 2016 and a fully operational status expected to be achieved by the end of 2017 (POV, 2016). The Port Authority is a member of Green Marine, as are a number of tenants operating terminals within the port jurisdiction. This organization shares best practices towards port greening among North American maritime operations, and aids in tracking the environmental reviews which help combat greenhouse gasses. Additionally, a series of initiatives in habitat enhancement, marine animal and mammal protections, and land renewal strategies demonstrate the port’s attention to coastline damage. Changes to terminal activities, such as the hybridization of dockside vehicles, or the installation of automatic turn offs to reduce machine idle time can also be found. Beyond Hall’s (2007) four environmental foci, the Port of Vancouver offers incentives to vessels entering their jurisdiction through the presentation of awards and the reduction of fees in exchange for meeting improved vessel standards which lower emissions and/or reduce the risk of contamination.

The differences between these two ports substantiate the fact that what occurs in one port may not occur elsewhere – and indeed, despite global standardization in port technologies, this is an industry in which local variations in work practices and governing institutions persist (Ng, 2010; Hall, 2014; Pallis & Brooks, 2008). The adoption of one measure or set of measures does not indicate that another port is likely to adopt a similar measure, even where these measures seem complementary. However, when a vessel makes a modification, the benefit of their modification moves throughout the world with them. Cities worldwide benefit from vessel changes such as conversions to Liquid Natural Gas (LNG) fuel, engine modification or scrubber installation, or even in energy capture experimentations such as the use of wingsails to capture and store wind energy while at sea (Yang et al, 2012) due to the decrease in harmful emissions these bring. In the fixed locations that are port sites, cities demand that these environmental threats be responded to.
Financial constraints, availability of investment interest, the pressure of national laws, geographical constraints and community pressures all impact the measures chosen to green the port, demonstrating the complex connections between the city and port that an Intelligent City 3.0 is intended to address. Current decisions, however, are primarily driven by either an Industrial City 1.0 or a Post-Industrial City 2.0 model, where factors, for example economic or environmental sustainability, are considered separately or within a value cluster, but exclude the historic, cultural or tacit knowledge that is obtained through synergistic interactions with those that serve as the pathway between the workplace and the city. There are, of course, exceptions to this; pockets of synergy exist. One example noted by the port scholar and urbanist, Jean Debrie, is the combination of industrial activities and public waterfront access along the River Seine in Paris. Here, a cement producer has modified their plant to allow waterfront access when the facility is not in operation.

The cities of Vitoria and Vancouver, as well as countless other port cities around the world, presently have the urban agglomeration of skills and knowledge surrounding waterfront work required to move towards a 3.0 city. Despite this ability, we have found that this possibility continues to go unrecognized (Soron, 2012). At the port of Vitoria not only are the potential contributions of dockworkers ignored, but a total lack of attention towards the port is found. Despite its political importance as the state capital of the Espirito Santo state, public policies do not recognize the cultural asset which the history of the port brings to the city, diminishing the historical role the port has played in developing the city to the point that these connections are in danger of being lost completely. Rather than embracing the heritage of the port, city policies treat it as merely as an isolated economic entity serving as a gateway for the movement of commodities (Vasconcelos, 2011). This treatment is typical of an Industrial City 1.0 with some movement to a Post-Industrial city 2.0. In Vancouver we find similar trends. Though the Port Authority is actively reaching out to the communities surrounding the port, the role of dockworkers in perpetuating waterfront culture continues to be largely overlooked. With the historic and cultural importance of the port unnoticed, the complex symbiotic and interdependent relationships which occur between the city and port (Hall & Jacobs, 2012) are missed, or even intentionally subdued.

Dockworkers are both members of the labour and residential communities, and as such serve as a critical connection between the waterfront and the communities in which they reside. Contrary to being simply an economic factor, the relationships dockworkers hold have great importance to the interconnectedness between the port and its surrounding regions, where influence moves both from the port to the region, and the region to the port (Ng, 2010). A myriad of actors work together to manage and process the flow of goods in the interactive, dynamic process which impacts the shape of its region (Hall & Jacobs, 2012). In the same way as the city of Vitoria’s focus has been on the economic benefits of the port, so also has academic interest focused on the economic angle of the port’s impact, with “inadequate attention to the human components of ports” (Ng, A., et al., 2014), exemplifying the need for a focus on the synergistic pathways which are created by human involvement. Human involvement has always been a key component of dock work. Historically waterfront tasks involved high levels of manual labour which required teams of labourers organized under foreman to carry out. This was dramatically altered by the advent of containerization, which reduced the need for specialized equipment to load and unload specific cargos. The universal handling of containerized cargos, along with the intermodality afforded by containers, enabled shippers with the ability to choose their port of choice without the restrictions of required equipment. Concealed within containers, goods can be handled at nearly any port with the infrastructure to process containers. This resulted in increased efficiencies which have emphasized competition between ports and encouraged the growth of the logistics planning industry. This change has emphasized the linear fashion described by Ravetz (2014) in an Industrial City 1.0, where the port’s role within the commodity chain is perpetuated, while the context of local value is ignored.
Despite the perpetuation of the port’s role as a link in the commodity chain, containerization has also increased the importance of dockworkers. Through increased efficiencies, dockworkers are able to increase the attractiveness of their port to logistics providers and shippers looking to move their discretionary cargoes as quickly as possible, enabling them to shape the geography of ports. In a poignant example of this, the longshore unions of the United States were able to both preserve their own rights and ease the transition from bulk cargoes to containerized shipping (Bonacich & Wilson, 2008; Herod, 2001). Although not as powerful as the ILWU on the west coast, united unions on the East and Gulf coasts were able to address the regional differences between the North and South, and shift their workplace practices to modernize the port while protecting their position within it, and simultaneously increase global trade and international collaboration. In contrasts to many other industrial unions, they were able to assert their role as a synergistic pathway - years before these concepts were laid out by academics.

In Brazil, dockwork is a craft heritage, with synergistic roles that differed from those on the US East Coast, but are present nonetheless. Traditionally, most dockworkers have held strong familial ties, with skills passed from father to son. With skills diffused in this manner, a nostalgic culture was passed intergenerationally, resulting in dockworker identities which held an idealized attachment of the past (Vasconcelos et al, 2015). These identities, in turn, shaped the workers’ understandings of their surroundings, which collectively combined to establish a group identity shared by all members of the dock work group (Jobson, 2014).

This identity and unification, cemented through a shared history of fighting for labour rights, was renewed in Brazil in response to the Modernization Law (Law 8.630/93), which hoped to increase efficiencies and competition in Brazilian ports through the improvement of infrastructure. Further, Brazil’s new Ports Act (Law 12.815/2013) mandates that all dock work be distributed through Órgão Gestor de Mão-de-Obra (OGMO), a labour administration body. In addition to the dispersal of work, the body is also responsible for training employees in safety and health areas, which includes workshops on environmental and sustainable practices.

Despite the economic focus of this modernization process, as OGMO replaced families in choosing the waterfront workforce a cultural impact was felt. Prior to modernization, family connections ensured that hardworking family members had access to waterfront work. With the implementation of OGMO nepotistic practices were replaced with a public contest system. This opened access to waterfront jobs to those previously excluded, but also diminished the importance of intergenerational knowledge transfer, a waterfront activity which frequently took place within the individual homes of workers. As jobs were transferred away from the family, the passion for labour “was slowly overstepped by a sense of duty and a common job routine shared by any other professional (Portogente, 2009).” The sense of pride which had previously been instilled in workers from their youth was replaced with a mundane obligation to complete one’s daily work in exchange for a paycheck. These changes, and their effects, are not unique to Brazil, rather are felt worldwide. Hall (2009) identifies similar patterns of change in the United States with increasing educations levels.

Where the family has lost importance as a place of knowledge transmission, unions continue to uphold their role in protecting spaces where discussions are facilitated as workers unite to fight to maintain their rights. As dock work shifts away from a personal identity which is cultivated in the home from a young age to that of a profession, the time that dockworkers spend building relationships with each other decreases. In Vitoria, this separation is amplified by OGMO, whose regulatory mandates restrict access to the dock by workers outside of their prescribed shifts, essentially scaling the interaction between dockworkers. The union, however, remains a locus for workers to identify common concerns and maintain their sense of community. In providing a physical space of solidarity, the union hall enables a mental space in which dockworkers can
re-engage with each other to share their thoughts and interests, effectively perpetuating a modified port culture (Dieguez, 2007).

While we have seen shifts to this culture over time, Miller (1969)’s identification of the universal port culture perpetuated by certain widely prevalent conditions remains consistent. The port is not only a gateway for the exchange of goods, but also of ideals, values, and changing morals which are transported globally and shared among maritime workers (Hilling & Hoyle, 1984). Around the world, and specifically across Brazil, dockworkers are united by common concerns which include the casual nature of waterfront employment, the dangers of the arduous work, a potential loss of work due to improvements in technology, a lack of access to and association with the employer, and the handling of foreign goods. They are further united by the common traits of continuous interaction with a variety of foreign workers and their ideas, and a shared belief that dock work is seen as a low status group in the standings of social hierarchies (Miller, 1969).

Further to this, dockworkers are more than just union and community members. Each worker is an individual with the agency to think and make decisions based on their own personal values (Hall & Jacobs, 2012; Vanoutrive, 2012). While these values may be influenced by the culture of the dock, the culture of the dock is also influenced by the individual. The relationships which give the union its strength are based on the collective ideas, thoughts, emotions and political ideologies which are brought together in a collaborative forum within the workplace and union hall, as well as beyond this, into the community as well. McMorran (2012) points to the importance of the individual in shaping the work that they do, noting the key role they play in executing their work. He further suggests that it is critical to gain an understanding of the role of the individual within the workplace if we are to fully understand the importance and impact of labour beyond that of the ‘docile body’ in an abstract economic system, rather as able to shape geographies within an “ever-shifting space of surveillance, creativity and potential” (McMorran, 2012, p. 493) that is the workplace. This is echoed by Pavlic et al. (2014) in the need to not recognize workers, but also the need for their buy-in if changes are to be successfully implemented.

As ports around the world increasingly draw their attention to protecting the environment in which they operate, this concept of shifting space proves to be particularly relevant. In the same way that individuals were able to come together to shape the geographies of containerization, so also does it seem likely that dockworkers will- and do- impact the geographies of sustainability measures within the port. Through their connections, they hold a unique ability to make connections between the port and city that cannot otherwise be made. As a result, dockworkers have valuable information that must be incorporated if we are to see an evolution towards and Intelligent City 3.0.

Conclusion

We have witnessed a move from Industrial 1.0 to Post-Industrial 2.0 Cities. As our cities continue to develop and progress, sustainability has arisen as an important aspect for consideration. Ushering effective, lasting sustainability practices which would present themselves in an Intelligent City 3.0 is not something that can be mandated by policy, rather requires involvement with the community. As key transmitters of historical and regional knowledge, dockworkers are an important bridge between the port and the surrounding port-city communities, providing a unique ability to draw on their experiences on the waterfront and in the community to connect policies and practices. Progressing from an Industrial City 1.0 to an Intelligent City 3.0 requires the engagement of the community, and specifically those within the community that make it a port city - the dockworkers.
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