

VULNERABILITY, HEALTH AND DISASTERS IN SÃO PAULO COAST (BRAZIL): CHALLENGES FOR A SUSTAINABLE DEVELOPMENT

LUCIANA DE RESENDE LONDE¹
LÍVIA GONZAGA MOURA²
MARCOS PELLEGRINI COUTINHO³
VICTOR MARCHEZINI⁴
ERICO SORIANO⁵

Introduction

In 2017, Brazil completed respectively 20 and 10 years having its National Water Resources Policy (PNRH) and its National Sanitation Policy (PNS). The evolution of the themes basic sanitation, health and sustainability in the country is interrelated, referring to management issues, social inequalities, political contexts and historical perspectives.

The regulation of water use in Brazil was characterized by placing this common good as part of an economic exploitation project carried out in the middle of the 19th century (FONSECA and PRADO FILHO, 2006; MURTHA, CASTRO and HELLER, 2015). By that time, the water supply was communitarian and free of charge - facilitated by public fountains and spouts - and the process of building pipes for water supply systems and collection of sanitary sewage took place. These services were led in several Brazilian municipalities by private companies, whose objective was to obtain profits on the invested capital. Therefore, only people who could pay would count on those services in their houses (MURTHA, CASTRO and HELLER, 2015). The process of economic exploitation of water due to the deactivation of the public fountains happened while the coverage by the supply network was expanded (MURTHA, CASTRO and HELLER, 2015). The population excluded from this process occupied the hills and peripheries of the cities. The elites lived in “central, elevated, ventilated and sunny areas of the center” while the poor population occupied the “distant, wet and marshy lowlands” (MURTHA, CASTRO and HELLER, 2015, p. 202).

1. Remote Sensing Doctor, Researcher at Cemaden – National Center for Monitoring and Early Warnings of Disasters. luciana.londe@cemaden.gov.br

2. MSc. - Sciences, Analyst at Cemaden – National Center for Monitoring and Early Warnings of Disasters, livia.moura@cemaden.gov.br

3. MSc. – Vegetal Production, Doctoral Student at Universidade Federal de São Carlos, mzpcout@gmail.com

4. PhD in Sociology, Researcher at Cemaden – National Center for Monitoring and Early Warnings of Disasters. victor.marchezini@cemaden.gov.br

5. Environmental Engineering Sciences Doctor, Consultant at Alea Consulting, ericogeo@gmail.com

Segregation and exclusion continued to be a Brazilian reality in the XX and XXI centuries, creating not only environmental injustice but also, as an important consequence of the latter, socio-environmental disasters, which are expressed by the spatial superposition of social and environmental problems and explain the relation between the worst socioeconomic indicators and the risks of floods and landslides. In the peripheries, there is a coexistence of situations of poor social conditions and cumulative exposure to several types of risk (ALVES and TORRES, 2006). These conditions are not due to natural phenomena, but rather from processes of creation of vulnerability (ACSELRAD, 2006a), that is, social and historical processes, whose economic and political-institutional practices compete to make vulnerable certain social groups. In other words, before the rainy season, we already know who will be the most exposed to social and environmental risks, to what types of risks they will be susceptible and the degrees of exposure. The mechanisms for production of this environmental inequality, that is, of the “unbalanced exposure of poor communities to risks or its environmental exclusion due to the concentration of the benefits of development in a few hands” (ACSELRAD, 2010, p. 109), are manifested in the form of unequal environmental protection, as well as unequal access to environmental resources (ACSELRAD et al., 2008).

Disasters reveal the actual social structure, highlighting the relationships between social inequities and exposure to hazards (VALENCIO, 2014). When the implementation of environmental policies and / or their omission in the face of market powers creates environmental risks to people with lower economic and / or political capital, it can be said that the environmental protection is uneven. But this inequality is also expressed in the access to environmental resources: “the richest tend to escape from environmental risks by living in safe areas whose soil is of more value. Poor people are pushed to conditions which are degraded by a double mechanism” (ACSELRAD et al., 2008, p.78): lower income populations go to areas of higher risk and with less infrastructure and, also, the sources of ecological impacts are addressed these areas. These connections reveal broad and complex socio-environmental conflicts that have been historically built in the society’s relations with the environment (VALENCIO, 2014).

An analysis by stratum in the municipality of São Paulo shows how the most privileged regions of the city are not affected by floods or by proximity to floodplains and streams, while the poorer groups reflect the convergence of several urban problems and socio-environmental precariousness (JACOBI, 1995).

The intensification of this process of social production of vulnerability, associated to the occurrence of events such as droughts and rains, has caused an increase in the number of Official Declarations for Emergency Situations and / or State of Public Calamity, according to data from the page of the Ministry of National Integration.

The consequences of disasters for public health are related to material and human damages. The operation of health systems can be directly affected by damaging facilities, disruption of basic services, destruction of communication routes and an unexpected number of deaths and illnesses, exceeding the capacity of the service network (PAHO / WHO, 2003). The losses associated with the service structure also refer to the losses of equipment and stock of medicines (PEREIRA et al., 2014). The damages suffered by

the population can be classified according to the time duration. Short-term damages, for example, include periods ranging from hours to days, whose records, according to Freitas et al. (2014), refer mainly to mortality and injuries. In the medium term there is an increase in diseases, especially the waterborne and vector borne ones, such as dengue, zika and malaria. Long-term impacts include depressive processes and psychosocial damages, mostly experienced by social abandonment in the process of reconstruction and recovery (VALENCIO; SIENA; MARCHEZINI, 2011; UNISDR, 2011; FREITAS et al., 2014), such as in the catastrophe of the Rio Doce Basin, after a dam failure in November 2015.

The overvaluation of the economic issue as a development goal - as in mining projects and the construction of large enterprises - and the belief that economic growth can meet social demands are obstacles to have an integrated view of the various dimensions of sustainability (JACOBI, GIATTI, 2015), including the reduction of inequality and vulnerability (MARCHEZINI, 2015; MARCHEZINI; WISNER; SOLD, SAITO, 2017). This overvaluation became clearer from the second half of the twentieth century, when the developmental ideal of the Brazilian government drove major transformations that were reflected in the urbanization process. This happened in an accelerated and concentrated way, being characterized by an unequal distribution of social and environmental costs and gains that contributed to induce the transformations in the urban space. The occupations tended to occur in areas with no commercial interest and no possibilities of economic exploitation, such as areas of environmental protection, water sources and areas subject to flooding and / or landslides. That is, the different degrees of exposure to risk, vulnerabilities and human security conditions that we are witnessing today derive from a long process of social construction of risks, induced by unequal urbanization (VALENCIO, 2012).

Although the evaluation of direct and indirect impacts - in the short, medium and long term - is important for planning actions to reduce damages, it is also essential to characterize the vulnerability process that precedes an emergency, an epidemic, a situation of public calamity. It is necessary to investigate this process in the context of neglected disasters (WISNER and GAILLARD, 2009), such as those associated with dengue, leptospirosis, zika and yellow fever, due to the increase in registered cases and the low capacity for reducing risks. According to ABRASCO (Brazilian Association of Collective Health), the emergence of the zika virus epidemic in Brazil is a sanitary tragedy: According to ABRASCO (2016, w/p):

the degradation of the living conditions in the cities, inadequate basic sanitation, particularly with regard to the difficulty of continuous access to water, poor garbage collection, sanitary sewage, carelessness with hygiene of public and private spaces - are the main responsible for this disaster.

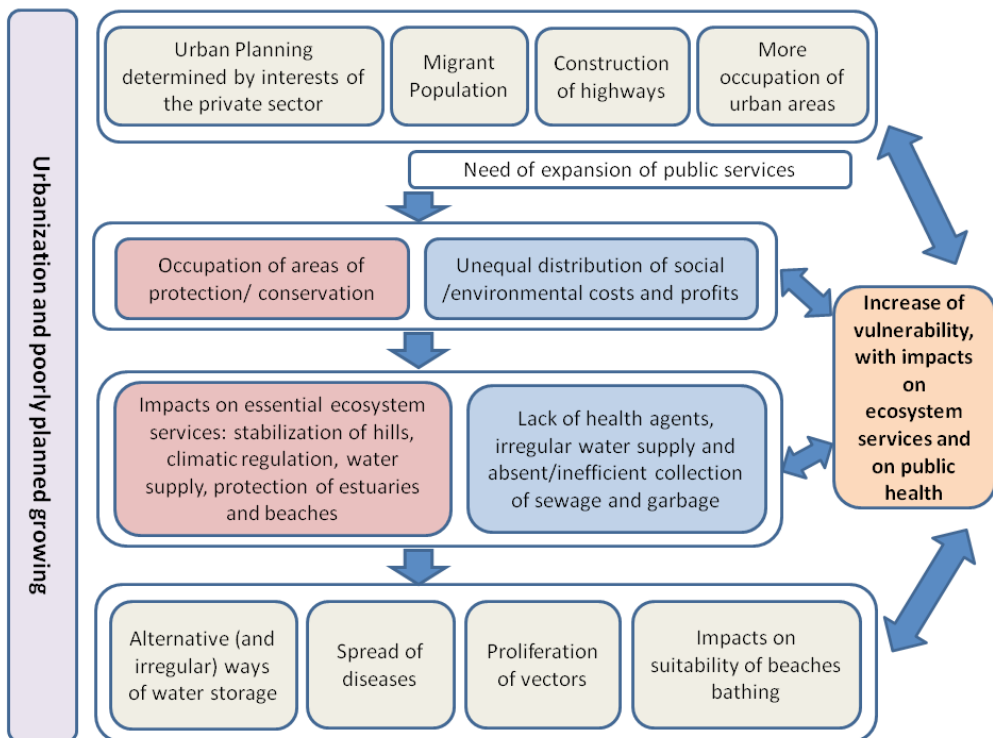
In this paper, we analyze data from several institutions, such as the SEADE Foundation, IBGE, Cemaden, the Ministry of National Integration and the Ministry of Health, and their connections within the scope of joint development of the health sector and sustainable development as strategies for vulnerability reduction, considering the coast of São Paulo state as a case study.

The process of growth and vulnerability production on the coast of São Paulo

In Brazil and in most countries, most of the population lives in urban areas. Many of the largest agglomerations are in areas of greater vulnerability, such as the coast (BUENO, 2011, CARMO et al., 2012). Cities offer an uneven life for its inhabitants and users. The infrastructure for environmental sanitation, energy, communications and mobility usually do not have universal social coverage (BUENO, 2011).

The intense population growth, together with the interference of enterprise interests in urban planning projects, generally leads to the occupation of large urban areas and, consequently, to the need to expand public services, generating demand for more local infrastructure. Sectors such as education, health, sanitation, safety, public transport and lighting require more resources whenever urban boundaries are expanded (TEIXEIRA, 2013). This need is not fully met and certain areas remain without basic sanitation and garbage collection services (Figure 1). In addition, urban growth generates forest fragments with more edge effects and the bare soil used for the deposition of solid wastes favors the proliferation of mosquitoes (HORTA et al., 2013) (Figure 1).

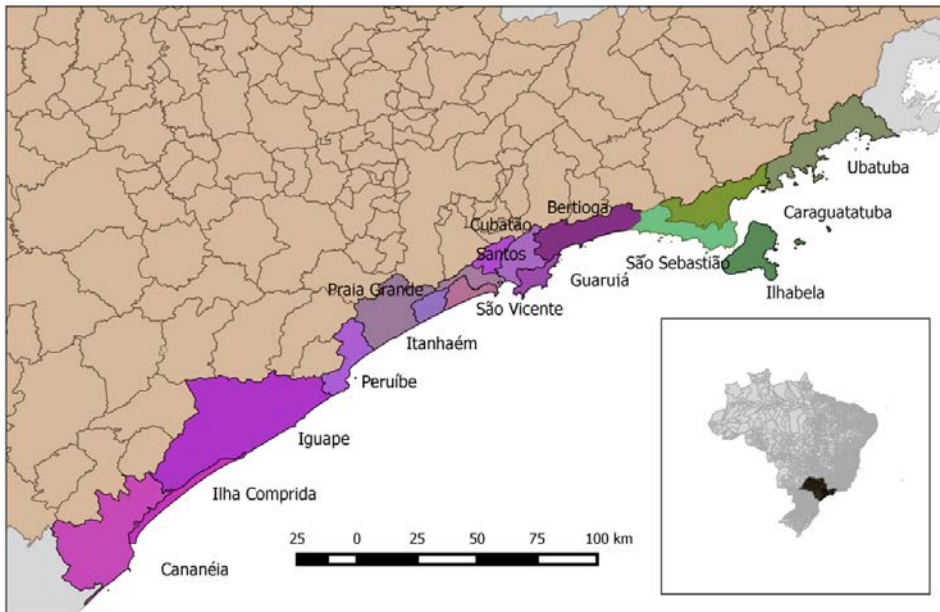
Figure 1: Interrelations between urbanization and vulnerability.



Source: Organized by the authors.

At the regional level, considering the analysis of municipalities along the coast of São Paulo, the urbanization process occurred at distinct periods in the southern and northern parts of the coast (Figure 2). In the South, there was an expressive urban spread in the 1940s and 1950s, with the creation of the petrochemical complex in Cubatão and the inauguration of the Anchieta Highway (SP-150), favored by its proximity to the megacity of São Paulo. In the North coast, urban densification intensified in the 1970s, driven by the extension of the Rio-Santos Highway (BR-101) towards the state of São Paulo in 1975 (SUSTAINABLE COAST, 2013). These development projects carried out by the state and federal governments have induced occupation in several areas of the region, characterized by hills, floodplain areas, mangroves and marine ecosystems.

Figure 2: Coastline of the state of São Paulo: southern municipalities in shades of pink, northern municipalities in shades of green, State of São Paulo highlighted on the map of Brazil on the right.



Source: Organized by the authors.

In the 1990s, the largest urban expansions were concentrated in the southern municipalities of the Baixada Santista Metropolitan Region (Peruibe, Mongaguá, Itanhaém and Praia Grande) and in Bertioga, which emancipated from Santos in 1991 and had a Geometric Annual Growth Rate (TGCA) of 11.30% in that decade (SUSTAINABLE COAST, 2013). The municipality of Bertioga continued to grow above the State and regional averages between 2010 and 2016, with TGCA of 3.13% (Table 1). Part of the migrant population, regardless of the location on the coast (South or North), began to live in precarious conditions and in illegal places, such as the slopes of the Atlantic Forest

and other protected areas (SÃO PAULO, 2014, SUSTAINABLE COASTAL 2013). This occupation characteristic exposes to the risk of both disasters and epidemics.

The municipalities of the region are located in areas where environmental zoning, established in the National Environmental Policy (PNMA), imposes limitations on land use and occupation, in order to minimize the impacts of human activities on the environment. The Atlantic Forest is the predominant vegetation, covering the “Serra do Mar’ and the coastal plain, with some municipalities showing good vegetation coverage, especially the municipalities of the north coast: Ubatuba (85% of vegetation), Ilhabela (84%), and São Sebastião (84%). On the southern coast, as the economic exploration projects started in the 1940s, municipalities usually have smaller remaining coverages (in Guarujá, for example, there are 43%). Only Cananéia (81%) and Mongaguá (80%) percentages are close to those found in the north coast (Table 1).

Table 1- Characteristics of the municipalities of the coast of São Paulo

Coast (N/S)	Municipality	Political Autonomy	Population (2016)	Growth Rate	Water Supply	Sanitation services	Collection of Solid Waste	IDHM	IPRS	Vegetation Cover (%)*	
São Paulo State			43.359.005	0,85	97,91	89,75	99,66	0,783	-	22,9	
South	Bertioga	1991	57.109	3,13	90,20	30,81	99,68	0,730	G2	78	
	Cananéia	1905	12.236	0,01	95,88	68,93	98,65	0,720	G3	81	
	Cubatão (*)	1948	125.047	0,88	87,76	54,09	99,05	0,737	G2	55	
	Guarujá	1934	305.938	0,87	93,17	77,97	99,17	0,751	G2	43	
	Iguape	1849	29.158	0,19	87,87	73,10	92,75	0,726	G4	74	
	Ilha Comprida	1991	9.774	1,38	88,75	38,04	97,91	0,725	G5	60	
	Itanhaém	1700	94.088	1,33	92,59	24,40	97,28	0,745	G4	77	
	Mongaguá	1959	51.380	1,79	97,48	32,66	99,20	0,754	G5	80	
	Peruíbe	1959	63.609	1,06	91,85	38,00	98,85	0,749	G5	69	
	Praia Grande	1964	295.928	2,09	98,81	72,53	99,69	0,754	G2	60	
	Santos	1546	424.599	0,21	99,80	99,56	95,29	0,840	G1	63	
	São Vicente	1700	347.733	0,76	99,36	87,08	99,71	0,768	G5	59	
	North	Caraguatatu ba	1857	110.384	1,55	98,21	57,94	99,79	0,759	G2	74
		Ilhabela	1805	31.508	1,91	81,40	7,37	99,48	0,756	G2	84
São Sebastião		1636	82.079	1,79	70,65	52,46	99,79	0,772	G2	84	
Ubatuba		1637	84.872	1,27	75,05	27,65	99,67	0,751	G4	85	

Source: IMP/SEADE. Specifications:

Growth Rate - Geometric Rate of Annual Population Growth - 2010/2016 (In % per year)

IDHM - Municipal Human Development Index (2010)

IPRS - São Paulo Social Responsibility Index (2014), where: G1 - municipalities characterized by a high level of wealth with good levels of social indicators; G2 - municipalities that, although with high levels of wealth, are not able to achieve good social indicators; G3 - municipalities with a low level of wealth, but with good social indicators; G4 - municipalities that present low levels of wealth and intermediate levels of longevity and / or schooling and G5 - the most disadvantaged municipalities of the State, both in wealth and in social indicators.

Water, sewage and garbage indicators for 2010.

* Vegetation data, source - SOS Mata Atlântica Foundation.

The portions of the Atlantic Forest continue to suffer pressure, demanding plans for the preservation, conservation and environmental recovery of its ecosystems (SÃO PAULO, 2014). A portion of 62.16% of the regional territory is inserted in Conservation Units (UCs), requiring care to maintain its characteristics and sustainability. Protection areas such as the State Park of Serra do Mar, Juréia-Itatins Ecological Station, the islands and protected marine areas, together with areas of the Atlantic Forest, provide essential ecosystem services like the water supply, the stabilization of slopes, the protection of estuaries and beaches and the climate regulation.

Some municipalities in São Paulo (Ilhabela, Itanhaém, Ubatuba and Bertioga) have low rates of sewage collection (Table 1), and this lack of basic sanitation infrastructure occurs mainly in vulnerable areas. The unequal distribution of public goods and services (sewage and waste collection, supply of piped water, presence of health agents), along with socio-spatial inequalities (AYACH et al., 2012) is one of the main factors of socio-environmental vulnerability, reflecting the problems on water resources and population health (Figure 1).

Even though there is a good rate of water supply in the region, irregular supplies in the peripheral areas of cities push the population to find alternative forms of storage, such as open reservoirs with no periodic cleaning, easing the proliferation of disease vectors (AYACH et al., 2012) (Figure 1). A similar process occurred in other regions of the State of São Paulo due to the water crisis between 2014 and 2016, which affected mainly the municipalities of the Metropolitan Region of São Paulo (RMSP).

The shortage in the provision of sanitation services creates favorable environments to the spread of diseases and also affects the bathing conditions of beaches. In addition, the increase in total urban solid waste requires more infrastructure and public expenditures, and the costs calculated for the coast of São Paulo are above the national average (SUSTAINABLE LITORAL, 2013). São Paulo coast has undergone transformations in the last decades and the urbanization processes generated strong impacts on the lives of those who live, work and visit the region. Currently, a new transformation process is being promoted in the region, through projects such as pre-salt exploration and expansion and modernization of highways and port areas (SUSTAINABLE LITORAL, 2013). The design and implementation of these development projects usually do not consider studies and analyzes that point out potential risks of disasters and epidemics that may be induced by these ventures.

Social-environmental disasters on the coast of São Paulo

Disasters are considered “socio-environmental” because they are the result of a deleterious interaction between two fundamental factors, one being classified as social and the other as natural: vulnerability conditions, which result from a social production on a territorial basis; and the occurrence of natural phenomena - rainfall or absence of it - that can trigger an event - floods, landslides, droughts - and cause damages (MARCHEZINI, 2009; VALENCIO, 2012). Therefore, rains, floods and landslides are not synonymous with disaster. Since different social groups are not exposed to the same hazards and do not have the same conditions to face them and recover, they present different conditions of vulnerability (MARCHEZINI, 2009; VALENCIO, 2012). As such conditions are neither

natural nor static, they have been conceptualized as processes that create vulnerability - the word “vulnerabilização” in portuguese (ACSELRAD, 2006; MARCHEZINI, 2014, VALENCIO, VALENCIO, 2017). The probability of suffering damages due to this interaction between social and environmental factors builds the concept of risk. According to Wisner et al (2003, p.49):

In evaluating disaster risk, the social production of vulnerability needs to be considered with at least the same degree of importance that is devoted to understanding and addressing natural hazards. Expressed schematically, our view is that the risk faced by people must be seen as a cross-cutting combination of vulnerability and hazard. Disasters are a result of the interaction of both; there cannot be a disaster if there are hazards but vulnerability is (theoretically) null, or if there is a vulnerable population but no hazard event.

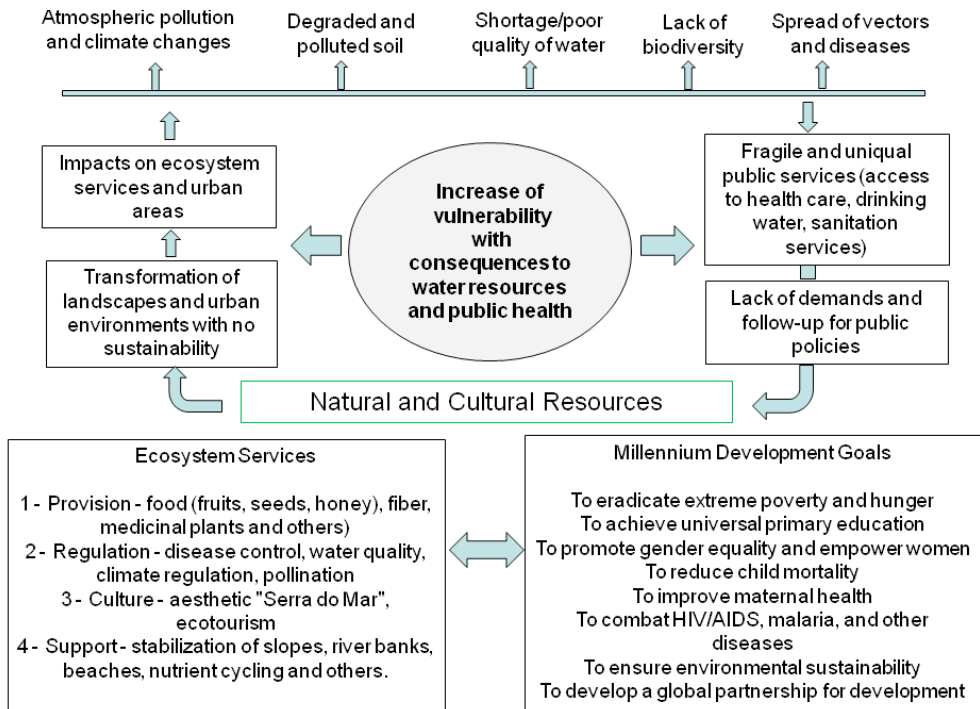
Understanding the relationship between hazards and vulnerability, especially in the consideration of the living conditions of the population groups, is fundamental for understanding the risks. According to Wisner et al. (2003, p. 6), this relation depends on how social systems and their relationships are associated with the power of impact in different social groups:

So people’s exposure to risk differs according to their class (which affects their income, how they live and where), whether they are male or female, what their ethnicity is, what age group they belong to, whether they are disabled or not, their immigration status, and so forth.

From the perspective of socio-environmental disasters, the risk reflects the relation with a danger associated with the presence of social groups in a certain locality and in a specific moment (VALENCIO, 2009; QUARANTELLI, 1998). In this way, the difficult consideration of different variables such as degree of exposure, level of risk, knowledge, communication and social cohesion, individual and group vulnerabilities, susceptibility of places, intensity and recurrence of physical processes, among others, is what makes it possible to identify risks for a population in a vulnerable condition.

The Global Assessment Report, which is published every two years by the United Nations Organization to assess the prospects and challenges related to major disasters in the world (UNISDR, 2015), presents data on vulnerability and shows that the relationship between poverty and disaster risk is two-way. The 2015 Report (Making Development Sustainable: The Future of Disaster Risk Management) emphasizes that we will not achieve a sustainable development if we do not reduce the risk of disasters and, unless the poverty and inequality are properly considered, disaster risk will continue to increase (UNISDR, 2015) (Figure 3). This report also highlights that disasters are not natural, but rather the result of failed development or underdevelopment projects. In the scientific field, there is a growing consensus about the denaturalization of “natural” disasters (O’KEFFE et al., 1976; MASKREY, 1993; MARCHEZINI, 2009; VALENCIO, 2012; PORTELLA et al, 2016).

Figure 3: Relations between sustainable development and disaster risk reduction.



Source: Organized by the authors.

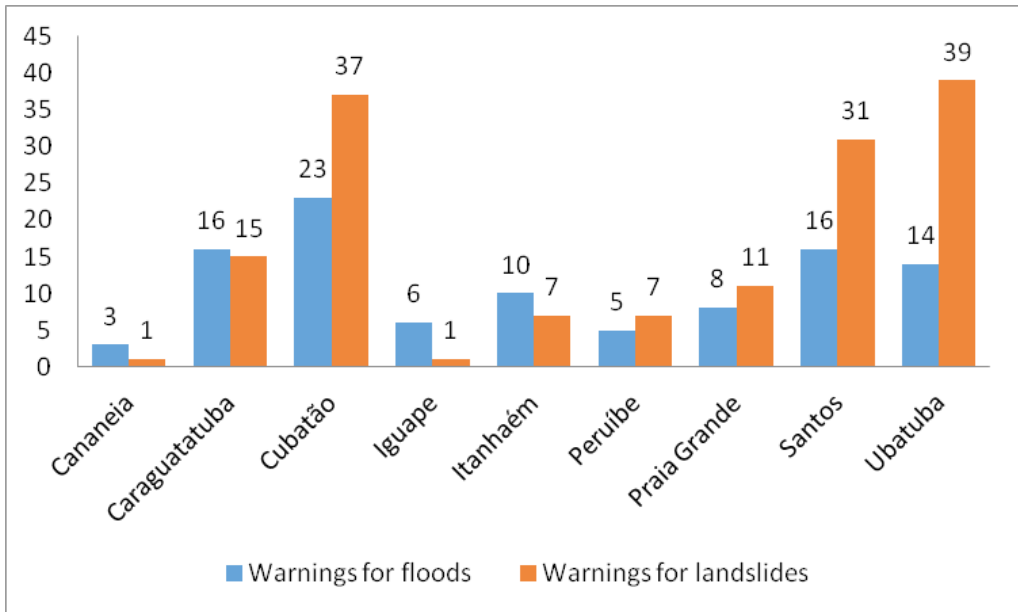
Some municipalities on the coast of São Paulo have an important history of occurrence and recurrence of physical processes that triggered disasters, especially the landslides in 1928 in Santos, and floods and landslides in Caraguatatuba in 1967, with 500 deaths officially registered (SANTOS, 2000).

The recurrence of processes that can interact and trigger disasters should be highlighted. On the one hand, extreme precipitation events, such as those occurring between 1987 and 1988 in Cubatão and Ubatuba. On the other hand, the increase of vulnerability, associated to susceptibility to mass movements, in areas with shallow soils and to occupations of risk areas induced by economic growth projects.

Based on this local susceptibility associated to the vulnerability of the population on the coast of the state, in 1997 the Civil Defense Preventive Plan (PPDC) was started, being specific for landslides on the “Serra do Mar” slopes (State Decree nº 30.860 of 04/12/1989 , redefined by Decree No. 42,565 of December 1, 1997). The PPDC, which operates annually from December to March, with the participation of the Geological Institute, the State Civil Defense and the Technological Research Institute, involves monitoring of rainfall indexes and meteorological forecasts, field surveys and emergency services and covers the municipalities of Santos, Cubatão, São Vicente, Guarujá, Caraguatatuba, Ubatuba, São Sebastião and Ilhabela.

From 2011 some municipalities along the coast are also monitored by the National Center for Monitoring and Early Warnings of Disasters (Cemaden) (Figure 4).

Figure 4: History of warnings of risks associated with floods and landslides, issued by Cemaden to the municipalities of the São Paulo Coast between 2011 and 2016.



Source: Cemaden. * Some municipalities are not mapped to multiple hazards, but receive integrated warnings.

Despite the history of risks of socio-environmental disasters and the high vulnerability of the population, the professional staff of the Civil Defense (DC) agencies still requires support for the full exercise of their activities (LONDE et al, 2015). According to data from the municipal profile (IBGE, 2013), the professional staff of DC is still composed by professionals with no permanent employment relationship with the institution, except for Cubatão, Guarujá, Ilhabela and Santos. Some DC agencies have carried out preventive actions, such as the zero invasion program of the municipality of Cubatão, which aims to avoid occupations in areas of environmental preservation and risk. In Santos, the municipal civil defense, together with health sector officials, are involved in preventive actions to reduce the proliferation of vectors transmitting dengue, chikungunya and zika (PREFEITURA MUNICIPAL DE SANTOS, 2017).

Current initiatives to monitor natural hazards (Figure 4) do not address the social dynamics which are necessary for an effective risk analysis. These monitoring practices understand disaster as an aggression by an external “enemy” that must be constantly controlled (VALENCIO, 2014), but disregard other factors, such as ecosystem services, the socio-environmental situation, land use and occupation dynamics, and the integrated view of the various components of the vulnerability process (Figures 1 and 3). These ap-

proaches make the view of society and institutions distant from the global understanding of the process of production of socio-environmental disasters.

Regional Health Scenario on the coast of São Paulo

Public health, environmental conditions and sustainability also act as driving factors that determine vulnerability. In this circle, critical health sector conditions will have a direct influence on disaster response capacity and the impacts of disasters can also have influence in this sector. Therefore, actions to promote sustainability and responsiveness will always be synergistic in support for coping with epidemics and disasters.

With perspectives to include the issue of health in disaster risk reduction (DRR) planning, the International Conference for the Implementation of the Health Aspect of the Sendai Framework for DRR was held in Bangkok (Thailand) in 2016. The Bangkok document contains measures that can help countries to implement their actions in health. The main points relate to health infrastructure and its articulations at different levels - national, local, public, private - with focus on people. When analyzing the data of São Paulo coast municipalities (Table 2) from the point of view of the Bangkok Principles, it can be seen that there are different conditions regarding health structure characteristics, vital statistics and social vulnerability (Table 2). With regard to infrastructure, we consider, in this analysis, the health services that are linked to the pyramidal model of the Brazilian Unified Health System (SUS), with first, second and third levels of attention, with increasing levels of technologies for health care.

A way of organization of this system is the Family Health Program (PSF), created in the 1990s with the perspective of readjusting the assistance model. From this point of view, the family and the environment where they live are the focus of attention, broadening the understanding about the health / disease process and, therefore, seeking synergistic actions among several areas such as sanitation, housing and environment (BRASIL, 1996a).

The municipality of Ilha Comprida has the highest mortality rate per thousand inhabitants and lack of infrastructure in the health sector, as well as Cananéia, Iguape and Peruíbe (Table 2). There are few emergency care units in municipalities with high risk of landslides, such as Caraguatatuba and Ubatuba (Table 2). In the analysis, there are different degrees of risk to life, either through exposure to diseases or by injuries and / or fractures due to landslides, or by poisoning due to technological accidents in the industrial complex. The degree of vulnerability is intensified by the multi-hazards registered in the region, in addition to the high social vulnerabilities observed in both urban and rural areas. Actions at the primary care level, such as the PSF, play a central role in reducing inequities and vulnerability, together with a health infrastructure with hospitals and emergency care units.

It is important to highlight that Primary Care is the first level of the health system and has the function of coordinating care actions in the service network, acting on the different health demands of the local population, with interventions directed either to the individual or to the collective service (VALLIM, 2015).

With regard to social vulnerability data, a significant part of the population of Bertioga (16.5%); Cubatão (31.0%); Guarujá (22.5%) and São Vicente (16.1%) live in areas of very high vulnerability (Table 2). In the municipalities of Praia Grande and Santos, even with good levels of municipal human development, there is also a part of the population (respectively 6.2 and 5.4%) in a situation of high vulnerability.

Strengthening infrastructure in the health sector could either prevent or minimize the effects of epidemics and provide adequate care to the population, generating better disaster response capacity. It is important to note the lack of emergency care units in municipalities with high risk of landslides, such as Caraguatatuba and Ubatuba (Table 2).

The municipality of Santos, a regional hub that concentrates several activities in the port area, has better conditions to meet demands in emergency cases. Cubatão and Guarujá have activities and services related to the petrochemical complex, which also offers several risks and demands hospital capacity of the health sector. This structure is essential in situations of disasters and emergencies, such as the fire in Vila Socó, in Cubatão, in 1984, with official records of 98 deaths (PORTO, 2016), landslides in January 1988 with 10 deaths (ROSA-FILHO and CORTEZ, 2010) or in situations of intoxication caused by chemical products of the petrochemical polo and the port area, as occurred in January 2016 (G1, 2016).

The municipalities of Cananéia, Iguape and Ilha Comprida, which have a precarious situation of health care establishments that serve the population, also do not have a first-aid mobile unit to provide first aid and emergency displacement of those injured and affected by disasters. It is important to mention that the urgent and emergency demands put pressure on the health services to organize themselves to attend serious patients who need more technological support and greater professional ability (ARAUJO et al., 2011). To organize the emergency care, the Ministry of Health established the Technical Regulation of State Emergency Systems, determining the organization of regional networks for integral attention to emergencies, as interconnected parts organized in fixed, mobile, hospital and post-hospital components (ARAUJO et al., 2011).

In Cananéia there are 12 thousand inhabitants (IBGE, 2014). Although it is located in the poorest region of the state (Table 2), it has three teams of PSF, a number that reaches the recommended ratio of 3,000 to 4,000 people for each team (MS, 2011). The presence of this program, considering its potential for prevention and health promotion, may have influenced the reduction of dengue cases between 2015 and 2016 (Table 2). Access to primary care services contributes to reducing hospitalization rates and improving indicators, as well as the quality of life, equity and population health (STARFIELD, 2002). In addition to their essential role in addressing issues related to social vulnerabilities, PSF teams can also act as partners in crisis situations, as they already know the territory and the local people. Thus, the PSF local unit can be used as a basis for evaluating, storing and distributing medicines and supplies; providing immediate data on the number and condition of the affected people and also participating in the orientation of the post-impact actions.

Table 2 – Data on health, development and social vulnerability related to the municipalities of the São Paulo coast

	Bertioga	Cananéia	Caraguatatuba	Cubatão	Guarujá	Iguape	Ilha Comprida	Ilhabela	Itanhaém	Mongaguá	Peruíbe	Praia Grande	Santos	São Sebastião	São Vicente	Ubatuba	
Health care	Mobile pre-hospital unit	3	0	5	3	7	0	0	2	7	4	3	6	12	6	4	4
	General Hospital	1	0	1	2	3	0	0	1	1	1	0	1	12	1	5	1
	First Aid Post	0	0	0	2	2	0	0	0	0	0	0	3	3	1	3	0
	Health surveillance	1	0	2	1	2	0	0	0	0	0	1	1	0	0	1	0
	Emergency Room	1	0	1	2	7	0	1	0	1	1	1	3	2	1	0	0
	Staff for Family Health Program	2	3	24	17	39	7	3	9	23	7	1	70	37	21	30	22
Health Statistics	Total dengue cases (2016)	798	4	60	46	904	6	1	125	31	4	93	26	1228	59	131	190
	Total dengue cases (2015)	489	75	5244	197	1285	218	211	871	4616	768	2185	3350	3697	4919	985	2226
	Child Mortality Rate (/thousand live births- 2015)	9,17	14,29	10,02	18,49	15,75	7,73	6,33	4,26	12,9	22,32	11,88	17,34	10,69	6,96	14,35	10,61
	General Mortality Rate (/thousand inhabitants- 2015)	5,26	7,86	7,23	5,71	6,33	8,29	10,88	3,83	8,84	9,21	9,13	7,79	9,64	5,17	6,91	6,45
	Beds - SUS (/mil inhabitants- 2014)	0,85	none	1,12	1,09	0,87	0,45	none	1,22	0,81	0,89	0,63	0,4	1,89	1,17	0,5	0,81
Index of Social Vulnerability in São Paulo	Group 5 – High (Urban) Vulnerability	24,3	26,5	21,6	1,8	6,5	10,2	5,6	17,6	20,8	20,7	25,8	25,5	2,4	30,1	4,4	32,7
	Group 6 – Very High Vulnerability (Urban Subnormal Agglomerates)	16,5	-	-	31	22,5	-	-	-	-	-	6,2	5,4	-	16,1	-	-
	Group 7 – High (Rural) Vulnerability	-	11,2	0,9	-	-	11,6	-	-	0,9	0,4	0,5	-	-	-	0,2	0,5

Sources: SEADE (2017), IBGE (2010), DATASUS (2017) and data reported by the Municipal Health Secretariats in the Information System (SINAN). Organized by the authors.

Bertioga was the only municipality analyzed that showed an increase in dengue cases between the years 2015 and 2016. Regarding the indicators, Bertioga stands out negatively in the high and very high vulnerability. It is a municipality of almost 60 thousand inhabitants that only has two teams of PSF and, still, does not count on a unit of emergency aid.

Most of the municipalities along the São Paulo coast may find it difficult to support the population in the event of a dengue epidemic or a similar one, especially when faced with dynamic risk scenarios, such as in the high season months, when the population gets three times bigger due to tourism.

These risk scenarios in the coast are worrisome, considering the combination of high socio-environmental vulnerability, epidemics, exposure to natural and technological hazards, and fragile capacity to respond to complex crises.

Convergences and divergences

In the current context, the economic growth, often confused with development, generates more costs, both in the health sector and in the disaster management sector. The distinction between economic growth and development is fundamental to understanding the process of social construction of vulnerability. Economic growth is a variation in the Gross Domestic Product, that is, a percentage change in the measured economic activity (VIEIRA; SANTOS, 2012). Development is a social project that prioritizes the effective improvement of the living conditions of the inhabitants of a nation, providing them with minimum conditions for the guarantee of dignity, the exercise of citizenship, increasing their self-determination and freedom of decision (CARVALHO, 2002; FURTADO, 2004, GONÇALVES, 2010).

“We must consider the substitution of that static idea of growth by a complex one, capable of encompassing several growths, decreasing and stabilizations” (JACOBI; GIATTI, 2015). These three processes are essential in the interaction between public health, disasters and sustainability in the urban environment. The responses of the health sector will be more robust and more effective in all phases of disaster risk management if they are linked to the promotion of egalitarian policies, taking into account ecosystem limitations, social justice and economic viability (JACOBI E GIATTI, 2015).

It is necessary to strengthen the Health System - SUS - which can act as a partner in both coping with acute crisis and also in reducing vulnerability, promoting environmental awareness, as well as a culture of prevention and involvement of social movements in health promotion. The perception of risk should not have a moralizing approach on the residents of areas considered at risk (CARDOSO, 2006), but overcome this bias and go further, including other actors such as legislators, educators, decision makers. Valencio (2014) points out that the discursive construction about populations affected by disasters “accuses certain populations of being unprepared, without conscience, without perception of their world”, making it difficult to deeply understand the processes of vulnerability social construction and the established asymmetries.

Public health issues should always be part of environmental impact studies - EIAs - and their environmental impact reports - RIMAs - as both are indispensable in growth and development processes.

Is it a good solution to respond to crises? Both in the case of epidemics and in the case of disasters, we have watched the focus of actions on the responsiveness of municipalities. Obviously the ability to respond is imperative. The preventive measures, however, are far from desirable.

In 2016 the Brazilian media showed photos of the armed forces designated to “fight against the dengue mosquito” (EL PAÍS, 2016, PORTAL BRASIL, 2016, G1, 2016A, G1, 2016B, CURRENT BRAZIL, 2016). This fact raises some questions: should we fight against existing vectors or should we promote public policies for the efficiency of basic sanitation to decrease the reproduction of vectors? Why the population is invited to participate only in responding to disasters but not in activities to prevent and reduce vulnerability? How to promote a culture of prevention? How are we preparing ourselves for the complex interactions involving sanitation, climate change and health?

Among the various pieces of news on the army’s action in the “fight against dengue”, one mentions that “the army will not participate in the information campaign in communities either dominated by drug traffic or places lacking basic sanitation and information - places which are considered important foci of mosquito infestation” (EL PAÍS, 2016). In another part of the same piece of news, the soldiers were not able to answer about the dangers of zika, the incidence of the virus in Rio de Janeiro and about the actions to be taken by the population; they stated that their function was only to “give the folder” (to the population) (EL PAÍS, 2016).

Despite the evident need to implement coordinated actions to address vulnerabilities, there are few concrete initiatives that focus on these issues. In Santos, for example, there is a legislation on Special Zones of Social Interest, which promotes the construction of housing and the environmental qualification of urban areas. The municipality has been carrying out integrated actions in areas mapped by the Geotechnical Chart with participation of the inhabitants of the risk areas, who are trained since the beginning of the 1990s, to monitor and report to the teams of the Civil Defense the changes in their living areas and adjacent slopes (BANDINI, 2014).

Another example is the Socio-environmental Recovery Program of the Serra do Mar and Atlantic Forest Mosaic System, executed by the Urban Housing Development Company (CDHU), Forest Foundation, Environmental Military Police and local actors. The program provides for the resettlement of more than 6,700 families and improvement of water quality, management strengthening and protection of conservation areas, as well as protecting an additional 20,000 hectares of Atlantic Forest and the recovery of 1,240 hectares of Serra do Mar State Park (SÃO PAULO, 2014).

However, we still need to progress in the coordination, formulation, implementation, monitoring and evaluation of projects and consistent actions of risk management and adaptation strategies in the context of global environmental changes. For this reason, it is a priority to promote synergies among different sectors, especially in a reality that requires

planning to increase institutional and social capacities in areas of socio-environmental vulnerability.

In opposition to the process of water merchantability mentioned earlier in this article, the City of London recently announced the launch of a new network of drinking fountains and sources for water supply as part of a plan to reduce the sale of plastic water bottles and the amount of waste created by the single-use plastic (THE GUARDIAN, 2018). Other cities in Europe also offer free public drinking fountains. In Brazil, the historical process has been characterized by social exclusion in the right to water, housing in decent and safe places, universal health (themes discussed in this paper) and in many other aspects. Data from the coast of São Paulo depict this scenario. An inadequate development has accentuated this process of exclusion in Brazil, and we must consider the decreases and stabilizations which are necessary to promote sustainability.

References

ABRASCO. **Cidades sustentáveis e saudáveis: microcefalia, perigos do controle químico e o desafio do saneamento universal.** <<https://www.abrasco.org.br/site/noticias/institucional/carta-de-alerta-da-abrasco-cidades-saudaveis-e-sustentaveis-este-e-o-desafio-urgente/15926/>> Acesso em 10/10/2016.

ACSELRAD, H. Vulnerabilidade ambiental, processos e relações. **Comunicação ao II Encontro Nacional de Produtores e Usuários de Informações Sociais, Econômicas e Territoriais**, FIBGE, Rio de Janeiro v. 25, 2006.

_____. Vulnerabilidade Ambiental, processos e relações. **Comunicação ao II Encontro Nacional de Produtores e Usuários de Informações Sociais, Econômicas e Territoriais**, FIBGE, Rio de Janeiro, 2006a.

_____. Ambientalização das lutas sociais – o caso do movimento por justiça ambiental. **Estudos Avançados**, v. 24, n.68, p.103-119, 2010.

_____. et al. **O que é justiça ambiental.** Rio de Janeiro: Garamond, 2008.

ALVES, H. P. F.; TORRES, H. G. Vulnerabilidade socioambiental na cidade de São Paulo: uma análise de famílias e domicílios em situação de pobreza e risco ambiental. **São Paulo em Perspectiva**. São Paulo: Fundação Seade, v.20, n.1, p.44-60, 2006.

AYACH, L. R. et al. Saúde, saneamento e percepção de riscos ambientais urbanos. **Caderno de Geografia**, v. 22, n. 37, p.47-64, 2012.

BANDINI, M. P. O PAPEL DA DEFESA CIVIL NA GESTÃO DOS RISCOS NATURAIS – O CASO DA ÁREA INSULAR DE SANTOS-SP. In: **ENCONTRO INTERNACIONAL DE VULNERABILIDADES E RISCOS SOCIOAMBIENTAIS**, 1, 2014. Anais...Rio Claro: UNESP, 2014, p. 503-510.

BRASIL. **DECRETO Nº 895, DE 16 DE AGOSTO DE 1993.** Dispõe sobre a organização do Sistema Nacional de Defesa Civil (SINDEC), e dá outras providências. Disponível em : <http://www.planalto.gov.br/ccivil_03/decreto/d0895.htm>. Acesso em 22 mai. 2017.

BRASIL, Ministério da Saúde. **Saúde da Família: Uma estratégia de organização dos serviços de saúde.** Brasília, 1996 a.

BRASIL. Ministério da Integração Nacional. Secretaria Nacional de Defesa Civil. **Manual para a decretação de situação de emergência ou estado de calamidade pública.** Brasília: Sedec, v. 1, 2007a.

_____. Ministério da Integração Nacional. Secretaria Nacional de Defesa Civil. **Manual para a decretação de situação de emergência ou estado de calamidade pública.** Brasília: Sedec, v. 2, 2007b.

_____. Ministério da Saúde. **Diretrizes nacionais para prevenção e controle de epidemias de dengue.** Secretaria de Vigilância em Saúde. Departamento de Vigilância Epidemiológica, p. 160, (Série A. Normas e Manuais Técnicos), Brasília. 2009.

_____. Ministério da Saúde (MS). **Política Nacional de Atenção Básica.** Brasília: MS; 2011.

BUENO, L. M. M. Cidades e mudanças climáticas no Brasil: planejamento de medidas ou estado de risco? **Sustentabilidade em Debate - Brasília**, v. 2, n. 1, p. 81-98, 2011.

CARDOSO, A. L. Risco urbano e moradia: a construção social do risco em uma favela do Rio de Janeiro, **Cadernos IPPUR**, Rio de Janeiro, Vol. 20, n.1, pp.27-48, 2006.

CARVALHO, J. M. **Cidadania no Brasil: o longo caminho.** Rio de Janeiro: Civilização Brasileira, 2002.

CASTRO, L. A. **Glossário de Defesa Civil: estudos de riscos e medicina de desastres.** 2.ed. Brasília: Ministério do Planejamento e Orçamento/Departamento de Defesa Civil, 1998.

DATASUS. **Departamento de Informática do SUS.** Página online datasus.saude.gov.br/ visitada em 15/10/2017.

El País (14 de fevereiro de 2016) **Brasil destina 60% das suas Forças Armadas na luta contra um mosquito.** Disponível em: <http://brasil.elpais.com/brasil/2016/02/13/politica/1455383958_196275.html> Acesso em: 14 março 2017.

FONSECA, A. de F.C.; PRADO FILHO, J. F. do. Um importante episódio na história da gestão dos recursos hídricos no Brasil: O controle da coroa portuguesa sobre o uso da água nas minas de ouro coloniais. **Revista Brasileira de Recursos Hídricos**, v. 11, n. 3, p. 5-14, 2006.

FREITAS, C. M. D. et al. Natural disasters and health: an analysis of the situation in Brazil. **Ciência & Saúde Coletiva**, v. 19, n. 9, p. 3645-3656, 2014.

FURTADO, C. Os desafios da nova geração. **Revista de Economia Política**, vol. 24, nº 4 (96), outubro-dezembro/2004.

G1 (12 de fevereiro de 2016). **Nuvem tóxica atinge quatro cidades no litoral de SP - vazamento continua.** <http://g1.globo.com/sp/santos-regiao/noticia/2016/01/nuvem-toxica-atinge-quatro-cidades-no-litoral-de-sp-vazamento-continua.html> Acesso em: 14 março 2017.

G1 (12 de fevereiro de 2016). **Forças Armadas terão 71 mil militares no combate ao Aedes aegypti no RJ**. Disponível em: <<http://g1.globo.com/rio-de-janeiro/noticia/2016/02/forcas-armadas-terao-71-mil-militares-no-combate-ao-aedes-aegypti-no-rj.html>> Acesso em: 14 março 2017.

G1 (27 de janeiro de 2016) Governo anuncia ação de 220 mil militares para combater Aedes aegypti. Disponível em: <<http://g1.globo.com/bemestar/noticia/2016/01/governo-anuncia-acao-dos-militares-no-combate-ao-aedes-aegypti.html>> Acesso em: 14 março 2017.

GONÇALVES, J. C. Impactos e medidas econômicas relacionados com desastres. **Com-Ciência** (UNICAMP), v. 117, p. 1-3, 2010.

HORTA M. A. P et al. Os efeitos do crescimento urbano sobre a dengue. **Rev. Bras. Promoc. Saúde**, Fortaleza, v. 26, n. 4, p. 539-547, out./dez., 2013.

IBGE – Instituto Brasileiro de Geografia e Estatística. **Página Inicial** <https://www.ibge.gov.br/> visitada em 15/01/2017.

JACOBI, P. R.; GIATTI, L. L. A ambivalência do desenvolvimento e a busca de novas vias para a sustentabilidade. **Ambient. soc.**, São Paulo, v. 18, n. 3, set., 2015.

JACOBI, P. Moradores e meio ambiente na cidade de São Paulo. **São Paulo: Centro de Estudos de Cultura Contemporânea**, Cadernos CEDEC, nº 43, 1995.

LITORAL SUSTENTÁVEL. **Resumo Executivo - Dinâmicas Regionais**. Disponível em: <<http://litoralsustentavel.org.br/wp-content/uploads/2013/09/Resumo-Executivo-Regional-Litoral-Sustentavel.pdf>>. Acesso em 31 jan. 2017.

LONDE, L. DE R. et al. Impactos de desastres socioambientais em saúde pública: estudos dos casos dos Estados de Santa Catarina em 2008 e Pernambuco em 2010. **Rev. bras. estud. popul.**, São Paulo, v. 32 n. 3, p. 537-562, dez. 2015.

MARCHEZINI, V. Dos desastres da natureza à natureza dos desastres. In: VALENCIO, N. F. L. da; et al. (Orgs.). **Sociologia dos Desastres: construção, interfaces e perspectivas no Brasil**. 1 ed. São Carlos/SP: RiMa, 2009, v.1, p. 48-57.

MARCHEZINI, V. Redução de vulnerabilidade a desastres: dimensões políticas, científicas e socioeconômicas. **WATERLAT-GOBACIT NETWORK WORKING PAPERS**, v. 2, p. 82-102, 2015.

MARCHEZINI, V. et al (Eds.). **Reduction of vulnerability to disasters: from knowledge to action**. São Carlos: RiMa Editora, 2017. 624 p. il. ISBN – 978-85-7656.050.0

MASKREY, A. (Eds.). **Los desastres no son naturales**, Red de Estudios Sociales en Prevención de Desastres en América Latina, Panamá, 1993.

MENDONÇA, F. de A.; SOUZA, A. V.; DUTRA, D. de A. Saúde pública, urbanização e dengue no Brasil. **Soc. nat.**, Uberlândia, v. 21, n. 3, p. 257-269, 2009.

MOURA, É. F. **Percepção de risco em área de população vulnerável a desastres naturais do município de Guarujá - SP**. Dissertação (Mestrado), Universidade Estadual de

Campinas, Instituto de Geociências. 2011, 88 f.

MURTHA, N. A.; CASTRO, J. E.; HELLER, L. Uma Perspectiva Histórica das Primeiras Políticas Públicas de Saneamento e de Recursos Hídricos no Brasil. **Ambiente & Sociedade**, v.18, n.3, p, 193-210, 2015.

OBSERVATÓRIO LITORAL SUSTENTÁVEL. Caderno Temático 3. **Gestão sustentável de resíduos sólidos urbanos – alternativas de tratamento dos resíduos orgânicos**. <<http://polis.org.br/publicacoes/gestao-sustentavel-dos-residuos-solidos-urbanos-alternativa-de-tratamento-dos-residuos-organicos/>> Acesso em 27/01/17.

O'KEEFE, P.; WESTGATE K.; WISNER, B. Taking the 'Naturalness' Out of 'Natural' Disasters. **Nature** 260(5552):566-567, 1976.

OPAS - Organização Pan-Americana da Saúde. **Protección de las nuevas instalaciones de salud frente a desastres naturales**: guía para la promoción de la mitigación de desastres. Washington, D.C.: Opas/Banco Mundial, 2003.

PEREIRA, C. A. R.; BARATA, M. M. de L. Organização dos serviços urbanos de saúde frente à mudança do clima e ao risco de desastres na América Latina. **Saúde Debate**, v. 38, n. 102, p. 624-634, set. 2014.

PORTAL BRASIL (29 de janeiro de 2016). **Papel das Forças Armadas no combate ao Aedes aegypti é destacado por Dilma**. Disponível em: <<http://www.brasil.gov.br/governo/2016/01/dilma-considera-forcas-armadas-essenciais-no-combate-ao-aedes-aegypti>> Acesso em: 14 março 2017.

PORTELLA, S. et al. Da “ponte sobre águas turbulentas” à reinvenção do “homem lento”: reflexões sobre assimetrias de saber e desastres. **Ciência & Trópico**, vol. 40, n 1. Recife: Fundação Joaquim Nabuco, 2016.

PREFEITURA DE SANTOS. **Mutirão com reforço da Defesa Civil vistoria 1.433 imóveis no Areia Branca**. Atualizado em: 11 fev. 2017. Disponível em: <<http://www.santos.sp.gov.br/node/895992>>. Acesso em 15 fev. 2017.

QUARANTELLI, E. L. **What is a Disaster?** Perspectives on the question. Routledge: London, 1998

REDE BRASIL ATUAL (29 de janeiro de 2016) **Governo federal mobiliza servidores e Forças Armadas contra Aedes aegypti**. Disponível em: <<http://www.redebrasilatual.com.br/saude/2016/01/governo-federal-mobiliza-servidores-no-combate-ao-mosquito-aedes-aegypti-6738.html>> Acesso em: 14 março 2017.

RIBEIRO, W. da C. RISCOS E VULNERABILIDADE URBANA NO BRASIL. Scripta Nova **REVISTA ELECTRÓNICA DE GEOGRAFÍA Y CIENCIAS SOCIALES**. Universidad de Barcelona. ISSN: 1138-9788. Vol. XIV, n.331 (65), 2010.

ROSA-FILHO, A.; CORTEZ, A.T.C. A problemática socioambiental da ocupação urbana em áreas de risco de deslizamento da “Suíça Brasileira”. **Revista Brasileira de Geografia Física**, 03 (2010), 33-40. Disponível em . Acesso em: 10 set. 2013

SAITO, S. **Estudo analítico da suscetibilidade a escorregamentos e quedas de blocos no maciço central de Florianópolis - SC**. 2004. 133 f. Dissertação (Mestrado de Geografia). Departamento de Geociências da Universidade Federal de Santa Catarina, Florianópolis-SC, 2004, 133p.

SANTOS, A.B. et al. A catástrofe de 1967. In: CAMPOS, Jurandyr Ferraz de. **Santo Antônio de Caraguatatuba: Memórias e Tradições de um Povo**. Caraguatatuba: FUNDACC, 2000. p. 373-386.

SÃO PAULO. **Serra do Mar e mosaicos da Mata Atlântica: uma Experiência de Recuperação Socioambiental**. 1ª edição. São Paulo: KPMO Cultura e Arte, 2014. .136 p. Disponível em: <http://arquivos.ambiente.sp.gov.br/serradomar/2016/12/AF_P_MIOLO_Livro-Serra-do-Mar-2.pdf>. Acesso em: 17 mai. 2017.

SEADE (IPVS) Fundação Seade. Índice paulista de vulnerabilidade social. São Paulo; 2005. Dados disponíveis em www.seade.gov.br/. Página visitada em 15/01/2017.

STARFIELD, B. **Atenção Primária: equilíbrio entre necessidades de saúde, serviços e tecnologia**. Brasília: Ministério da Saúde; 2002.

TEIXEIRA, L. R. **Megaprojetos no litoral norte paulista: o papel dos grandes empreendimentos de infraestrutura na transformação regional**. Tese (Doutorado em Ambiente e Sociedade) - Instituto de Filosofia e Ciências Humanas da Universidade Estadual de Campinas, Campinas, 2013.

THE GUARDIAN. **New fountains and bottle-refill points to tackle London's plastic waste**. <https://www.theguardian.com/environment/2018/jan/23/new-fountains-and-bottle-refill-points-to-tackle-londons-plastic-waste>. Página visitada em 17/04/2018.

UNISDR - International Strategy for Disaster Reduction. **Global assessment report on disaster risk reduction**. Geneva, Switzerland: ISDR, 2011. Disponível em: <<http://www.unisdr.org/we/inform/publications/19846>>. Acesso em: 11 nov. 2015.

UNISDR. **Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters**. United Nations: Geneva, 2005.

VALENCIO, N. F. L. da S. Vivência de um desastre: uma análise sociológica das dimensões políticas e psicossociais envolvidas no colapso de barragens. In: VALENCIO, N. F. L. da; et al. (Orgs.). **Sociologia dos Desastres: construção, interfaces e perspectivas no Brasil**. São Carlos: RiMa, 2009, v. 1, p. 160-175.

VALENCIO, N. F. L. da S.; SIENA, M.; MARCHEZINI, V. **Abandonados nos desastres: uma análise sociológica de dimensões objetivas e simbólicas de afetação de grupos sociais desabrigados e desalojados**. Brasília: 1ª edição, Conselho Federal de Psicologia, 2011.

VALENCIO, N. F. L. da S. **Para além do “dia do desastre” – o caso brasileiro**. Curitiba: Editora Appris, 2012.

VALLIM, S., VIEIRA, A. M. L., OSIANO, V. L. L. R. **A Estratégia Saúde da Família – Qualis – Em 101 Municípios do Estado de São Paulo**. São Paulo (Estado). Secretaria da

Saúde. Coordenadoria de Planejamento de Saúde, p.189-205, 2006.

VEYRET, Y. **Os Riscos: o homem como agressor e vítima do meio ambiente**. São Paulo: Contexto, 2007.

VIEIRA E. T.; SANTOS, M. J. Desenvolvimento econômico regional – uma revisão histórica e teórica. **G&DR – Revista Brasileira de Gestão e Desenvolvimento Regional**. v. 8, n. 2, p. 344-369, mai-ago/2012, Taubaté, SP, Brasil.

WILHITE, D. A. The enigma of drought. In: WILHITE, D. A. **Drought assessment, management, and planning: Theory and case studies**. Springer US. p. 3-15, 1993.

WISNER, B.; GAILLARD, J.C. An introduction to neglected disasters. **JAMBA: Journal of Disaster Risk Studies**, Vol. 2, No.3, pp. 151-158, 2009.

WISNER, B. et al. **At Risk: natural hazards, people's vulnerability and disasters** Second edition 2003 .

Submitted on: 10/05/2017

Accepted on: 07/06/2018

<http://dx.doi.org/10.1590/1809-4422asoc0102r2vu18L1AO>

2018;21:e01022

Feature Topics

VULNERABILITY, HEALTH AND DISASTERS IN SÃO PAULO COAST (BRAZIL): CHALLENGES FOR A SUSTAINABLE DEVELOPMENT

Resumo: Grande parte da população mundial vive em cidades, com estimativas crescentes para os próximos anos. Muitas estão em áreas de maior vulnerabilidade, como o litoral. O crescimento demográfico demanda a expansão dos serviços públicos, gerando a necessidade de mais infraestrutura local. O crescimento econômico, confundido cotidianamente com desenvolvimento, pode aumentar os riscos de epidemias e de desastres, quando há ocupação de áreas de risco e desigualdade no fornecimento de serviços básicos como coleta de lixo e sistema de esgotamento sanitário. Este trabalho, no escopo da evolução conjunta do setor de saúde e do desenvolvimento sustentável como estratégias para redução da vulnerabilidade, faz um recorte metodológico para o litoral do estado de São Paulo, com análises das conexões com dados de desastres socioambientais. Os municípios do estudo apresentam uma boa estrutura de monitoramento de riscos de desastres por diferentes órgãos, porém estas iniciativas atualmente são insuficientes para a promoção do desenvolvimento sustentável.

Palavras-chave: vulnerabilidade socioambiental, gestão urbana, crescimento econômico, defesa civil, dengue

Abstract: A large part of the world's population lives in cities, with growing estimates for the coming years. Many agglomerations are in areas of greater vulnerability, such as the coast. Demographic growth demands a larger area, with expansion of public services and more local infrastructure. Economic growth, usually confused with development, can increase the risks of epidemics and disasters, when people start to live in risk areas and there is inequality in the provision of basic services. This work, within the scope of the joint evolution of the health sector and sustainable development as strategies to reduce vulnerability, makes a methodological cut for the coast of the state of São Paulo - Brazil, with analyzes of the connections with socio-environmental disasters data. The municipalities in this study present a good structure for monitoring the risk of disasters, but it is not enough to promote a sustainable development.

Keyword: Socio-environmental vulnerability, urban management, economic growth, civil defense, dengue fever.

Resumen: Gran parte de la población mundial vive en ciudades y hay estimaciones de aumento para los próximos años. Muchos de los asentamientos más grandes se encuentran en

las zonas más vulnerables, como la costa. El crecimiento de la población urbana requiere la expansión de los servicios públicos y más infraestructura local. El crecimiento económico, que se puede confundirse con el desarrollo, puede aumentar el riesgo de epidemias y desastres, cuando hay ocupación de zonas de riesgo y la desigualdad en la prestación de servicios básicos. Este trabajo, en el ámbito del desarrollo conjunto del sector de la salud y el desarrollo sostenible como estrategias para reducir la vulnerabilidad, hace una aproximación metodológica a la costa de Sao Paulo - Brasil. Los municipios del estudio tienen una buena estructura para mapear riesgos. Sin embargo, el mismo no es cierto para la promoción de un desarrollo sostenible.

Palabra clave- vulnerabilidad, gestión urbana, crecimiento económico, protección civil, dengue
