POLÍTICAS PÚBLICAS LOCAIS PARA ADAPTAÇÃO ÀS MUDANÇAS CLIMÁTICAS (MC): DESAFIOS E OPORTUNIDADES AO TERRITÓRIO DO RECÔNCAVO, BRASIL

LOCAL PUBLIC POLICIES TO CLIMATE CHANGE (CC) ADAPTATION: CHALLENGES AND OPPORTUNITIES TO RECÔNCAVO TERRITORY, BRAZIL

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Resumo: Adaptar-se às mudanças climáticas é um desafio tanto no nível global quanto no nível local. O objetivo deste estudo foi avaliar os desafios e as oportunidades existentes no contexto de adaptação às mudanças climáticas para o Território de Identidade do Recôncavo. A metodologia contemplou pesquisa bibliográfica e análise da base de dados do IBGE para o levantamento de pontos fortes e fracos da região. Na sequência, uma matriz *SWOT* foi elaborada. Destacam-se como pontos fortes encontrados, a comunicação por meio de rádio e TV, e as iniciativas para prevenção contra problemas climáticos no setor agropecuário. Entretanto, como pontos fracos a serem superados, destacam-se a lacuna de base de dados municipais, além da baixa articulação entre as secretariais municipais no desenvolvimento das ações institucionais. Esses e outros aspectos são apontados na pesquisa, evidenciando insights para um melhor planejamento governamental para lidar com os impactos das mudanças climáticas no Recôncavo.
**Palavras-Chave:** Governos locais. Planejamento estratégico. Bahia.

Abstract: Adapting to climate change is a challenge in both global and local levels. The goal of this study was evaluating the existing challenges and opportunities in the climate adaptation context to the Recôncavo Identity Territory. The methodology adopted bibliographical research and data analysis of IBGE database. Afterward, a SWOT matrix was elaborated. The strong points found were communication by radio and TV, and the initiatives of prevention against climate problems in the livestock sector. However, among weak points to be overcome, lack of municipal database stands out and also low articulation among municipal departments in the development of institutional actions. These and other aspects are pointed out in this study, evidencing insights for a better governamental planning to deal with climate change impacts in Recôncavo Territory.
Key Words Local governments. Strategic planning. Bahia.

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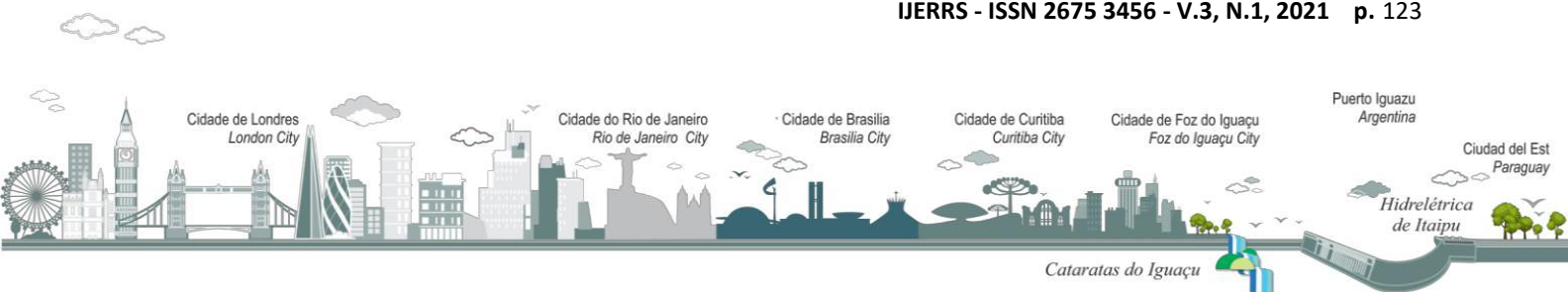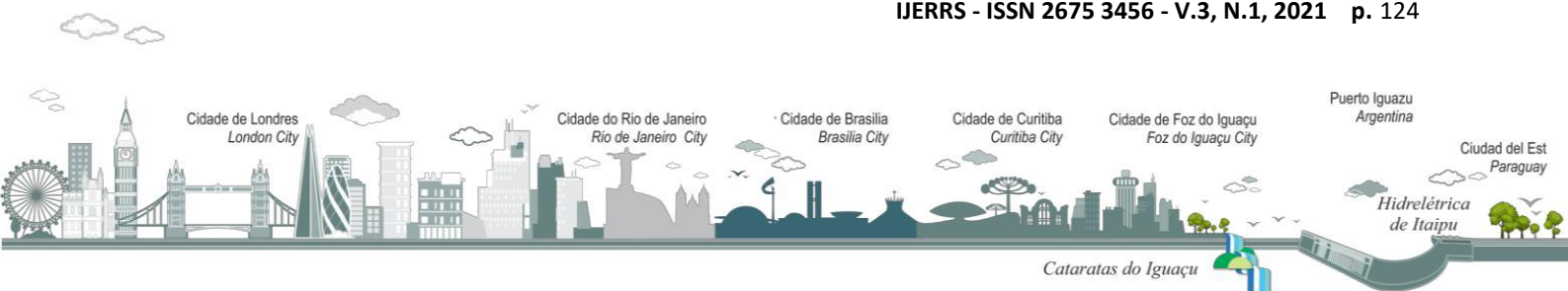
INTRODUCTION

In the international and national literature there are several pieces of research about Climate Change (CC), since their natural concept to policy dimensions (MINARI; CARMO, 2014; FUNTOWICZ, 2020). From reports of the Intergovernmental Panel on Climate Change (IPCC) to policy instruments, facing CC is moving from an intentional speech to action local planning. However, beyond that, cooperated actions to deal with it, budget availability, knowledge and politic desire to support changing initiatives also are necessary.

Other aspects – scientific, institutional and political – might influence on how a climate policy is designed or implemented. Potentials and existing subtle barriers might shape policy implementation (ABEL, 2019), as a result the recognition of it helps managers elaborate better strategies to reach effective climate adaptation. The goal of this study was evaluating the existing opportunities and challenges to Recôncavo Territory to face climate change impacts.

CONCEPTUAL FRAMEWORK

Climate change (CC) has occurred naturally throughout the long history of the planet and is a highly important factor to drive life maintenance. However, studies show that CC with current and future impacts are results of greenhouse gas (GHG) emission by industries, that is human activities, since the Industrial Revolution (YOUNG *et al.*, 2019; JURJONAS *et al.*, 2020) until now and with intensity that is higher than natural processes.

Among the expected impacts of CC are sea level rise, changing of frequency of climatic events, global warming and many others (CESANO *et al.*, 2012; ABDUL-RAZAK; KRUSE, 2017). Although extreme events - floods or droughts - are not caused by CC, the intensification of these, due to CC, might affect mainly vulnerable people in

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poor or risky conditions of urban and rural living, as consequences of the rise on their rate and the lack of existing infrastructure in these places (BROSKA; POGANIETZ; VÖGELE, 2020).

Although most about CC is known due to reports from IPCC, this theme involves several interconnected aspects, not only the scientific one, as illustrated in figure 1. From the simplest to the most robust ones, the actions and strategies to deal with CC contemplate both the mitigation and adaptation measures. The first one has the main goal of reduction and keeping stable levels of GHGs emission. Secondly, adaptation measures have the goal to prepare human and ecological systems to manage CC effects, reducing threats and seizing the opportunity (YOHE; TOL, 2002; YOUNG *et al.*, 2019).

Figure 1 – Climate change and their dimensions
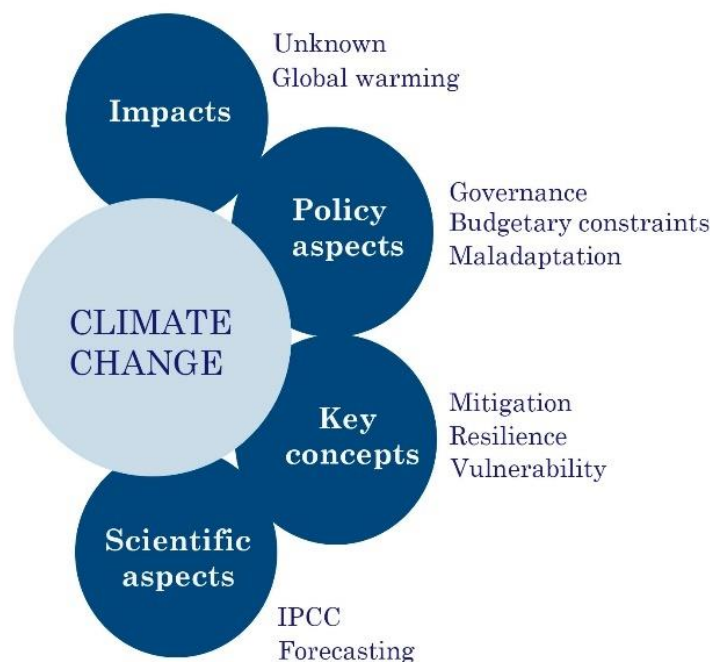
Source: authors' conception, 2021.
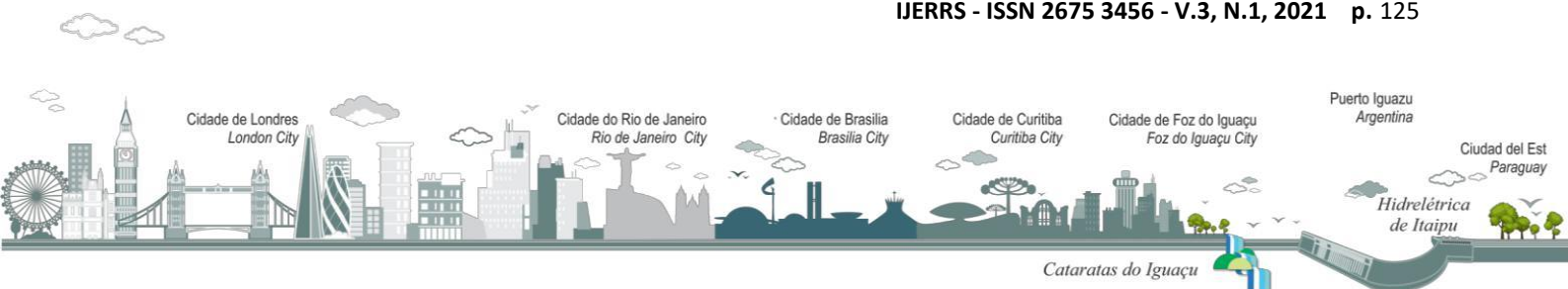
In 2009, National Climate Change Policy was implemented in Brazil by law 12,187 and had among its goals the compatibility of national development with climate system protection and the implementation of adaptation measures. In an adaptational approach, the Brazilian National Plan of Adaptation was established by the ministerial ordinance number 150 from 2016, and its coordination is under the responsibility of the Ministry of Environment but it also is a joint work plan with other federal ministries. It has 11 main sectoral and thematic axes, e.g. agriculture and cities (MMA, 2016). In addition, it is like a beacon to guide governmental actions in different government levels - federal, state and municipal, since considering the local priorities and competences.

Currently, among Brazilian states with adaptation plans Pernambuco, Bahia, and São Paulo stand out. In contrast, adaptation plans in Brazilian municipalities are scarce. In Bahia state, located in Brazilian northeastern region, its capital Salvador has finished adjusting to the final official plan in 2020. In 2007, for the purpose of policy planning, the concept of Identity Territory (IT) was elaborated and the state was divided into 27 IT unities (SEI, 2016; SANTOS; ALENCAR, 2017). This concept was better defined by law 12,050 from 2011, that established CC state policy and whose meaning takes into account the cohesion of socio-economic aspects.

METHODS

The study area was the Recôncavo IT (Figure 2), featured by tobacco culture and nautic activities in Paraguaçu river. With a territorial area of 5,221 km^2, this region has 19 municipalities[3] (SEI, 2016) and it was important in the historic fight of the Independence of Bahia. The main economic activities are livestock production and the sector of commerce and services (IBGE, 2018).

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[3] Cabaceiras do Paraguaçu (CBP), Cachoeira (CCH), Castro Alves (CAL), Conceição do Almeida (COA), Cruz das Almas (CDA), Dom Macedo Costa (DMC), Governador Mangabeira (GMA), Maragogipe (MGP), Muniz Ferreira (MZF), Muritiba (MTB), Nazaré das Farinhas (NZE), Salinas das Margaridas (SMA), Santo Amaro (SAM), Santo Antônio de Jesus (SAJ), São Félix (SFX), São Felipe (SFP), Sapeaçu (SPU), Saubara (SBA), Varzedo (VZD).
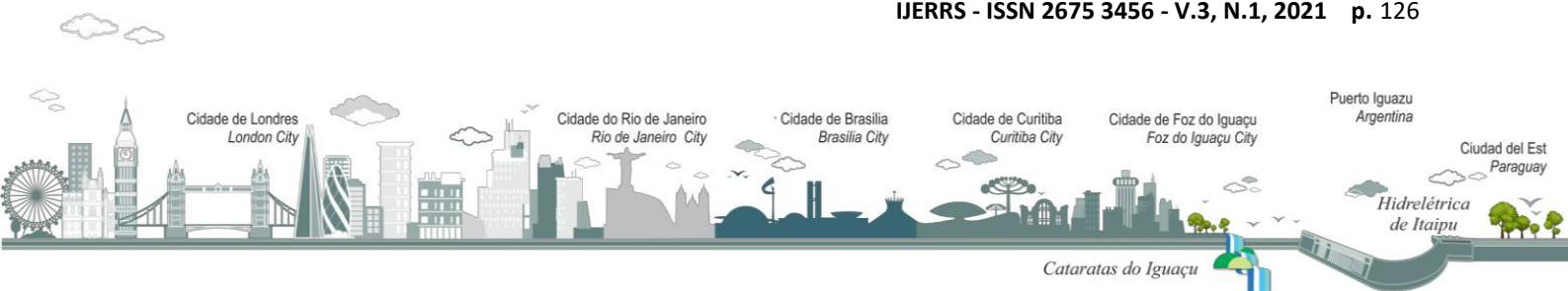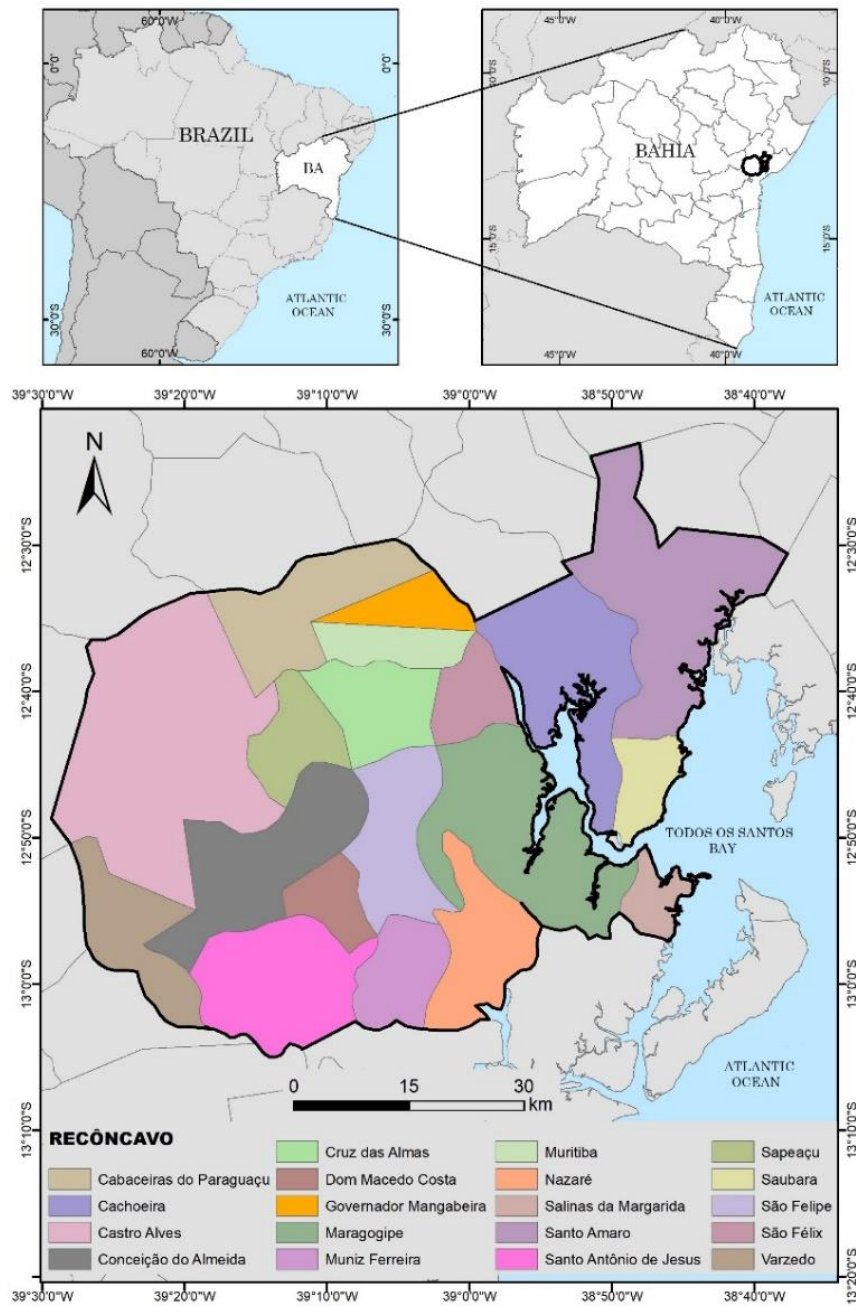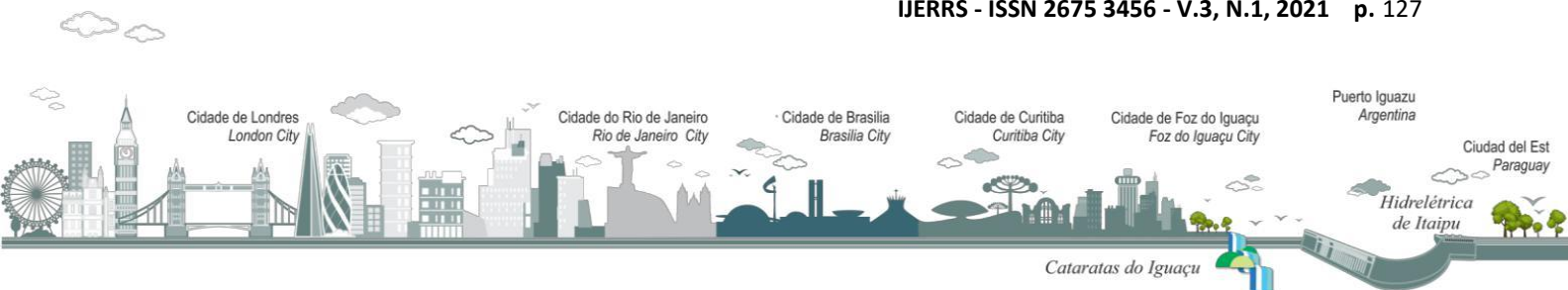
Figure 2 – Study area (*Datum* SIRGAS 2000)

Source: Adapted from Ferreira (2019). Elaborated by Daniele Vasconcelos, data source: IBGE (2010) and SEI (2017).

The methodology adopted bibliographical research and data analysis of the Brazilian Institute of Geography and Statistics (IBGE) database, collected from October to December 2018 based on several census. Strong and weak patterns considered from the nineteen existing municipalities in Recôncavo IT were organized in an excel spreadsheet. As a result, a SWOT matrix - strengths, weaknesses, opportunities and threats - was elaborated to better outsource existing challenges and opportunities to the IT facing CC.

After displaying all the elements of the matrix, the analysis was made based on interface of strengths and weaknesses with opportunities and threats. To each interface one value was used from one to three, to mensure how it impacts potentials or vulnerabilities of this region. After proper calculation, these values are converted to impact value and compared, providing important information for the elaboration of strategies to reach goals, in this case, deal with CC in the local context.

RESULTS AND DISCUSSION

In a general approach, data found about social economic aspects of Recôncavo IT - charts 1 and 2 – generically convey the published concept of IT in Bahia state, despite some exceptions into municipalities.

Demographic and socioeconomic characterization

Gender, income and educational level. Overall, the estimated population is predominantly female (average = 51.4%), and the most part has an income equal to or less than 1 minimum wage (relative frequency = 80.2%). In educational terms it was observed that people aged 15 or more who did not know read and write, the relative frequency to brown (52.4%) and black (35.2%) categories stood out respectively. About social development and income concentration aspects, MHDI and Gini index varied into municipalities.
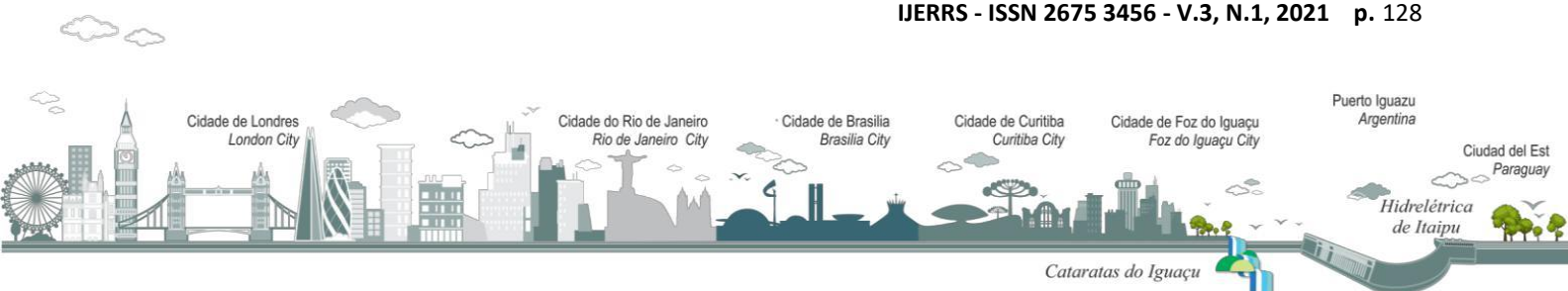
Chart 1: Demographic data from municipalities of Recôncavo IT

| Indicator		CBP	CCH	CAL	COA	CDA	DMC	GMA	MGP	MZF	MTB	NZE
Gender (%)	Male	49.3	48.3	48.3	48.7	47.2	49.0	47.9	50.3	50.3	47.5	48.5
	Female	50.7	51.8	51.7	51.3	52.8	51.0	52.1	49.8	49.7	52.5	51.5
Income (MW[4])	None until ¼	1,799	2,587	2,037	965	3,682	345	1,400	4,320	649	1,899	2,100
	> ¼ to 1	2,168	4,743	5,058	DNA	9,326	650	3,195	5,913	1,312	4,894	4,275
	> 1 to 2	264	1,187	638	541	2,400	123	562	1,242	209	937	970
	> 2 to 5	64	631	305	300	1,227	54	166	461	58	461	518
	> 5	22	142	83	DNA[5]	568	8	71	106	22	122	126
Educational level[6] (people)	NSIES	10,114	15,448	14,468	10,664	24,043	2,183	9,639	23,652	4,151	14,485	13,868
	ESIHS	1,627	3,895	2,962	1,702	7,845	503	2,905	5,153	794	4,426	3,589
	HSIHE	2,026	6,974	3,556	2,837	15,444	593	3,536	6,887	1,286	4,780	4,800
	HE	142	822	396	249	2,897	40	376	279	56	662	511
	DND	31	8	73	19	19	8	48	155	13	251	396
People age 15 or more not know read or write	Yellow	45	68	49	12	51	4	26	102	5	52	18
	White	306	272	439	239	546	115	100	1,080	192	384	399
	Indian	3	12	26	3	6	DNA	6	1	DNA	DNA	1
	Brown	1,774	1,598	2,484	1,607	2,793	351	1,335	4,017	728	1,862	2,220
	Black	1,029	1,914	1,293	981	1,931	154	1,045	2,111	353	1,381	1,151
Sanitation (%)	Adequate	4.0	44.5	53.6	19.3	16.6	6.5	5.7	37.7	19.4	12.7	49.7
	Inadequate	53.3	17.7	30.7	32.9	12.0	45.6	43.3	33.4	26.5	22.0	14.2
	Semi-adequate	42.7	37.8	15.8	47.8	71.5	47.9	51.0	28.9	54.1	65.4	36.1
Houses with piped water	Yes	2,818	7,937	6,081	DNA	15,570	1,063	3,566	9,973	1,858	6,672	6,707
	No	1,497	1,353	1,140	DNA	1,632	116	1,828	2,069	391	1,642	1,282
Fleet (unit)	Car	646	2,366	1,690	1,129	27,707	294	2,301	2,025	563	2,456	2,492
	Pickup truck	142	312	372	254	1,698	66	306	294	94	261	489
	Minibus	30	125	25	49	363	30	50	50	43	49	73
	Motorcycle	1,199	1,467	2,411	1,213	11,510	442	2,585	2,485	540	2,630	3,062
	Bus	66	85	65	39	110	10	45	59	10	39	44

Source: authors' conception based on several census IBGE database.

Sanitation and housing. A part of the population still lacks piped and quality water supply (relative frequency = 13.8%) for their basic needs and only 26.9%

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[4] MW: Minimum Wage. Obs. Income classes were added into a unique class to 'none until ¼ MW' and '2 to 5 MW'. DNA were not found to COA in the categories 'until '1/4 MW', 'from ¼ to 1 MW' and 'more than 5 MW'.

[5] DNA: Data not available.

[6] NSIES: No School to incomplete elementar School; ESIHS: Elementary School to incomplete Highschool; HSIHE: Highschool to incomplete high education; HE: High education; DND: Data not determined.
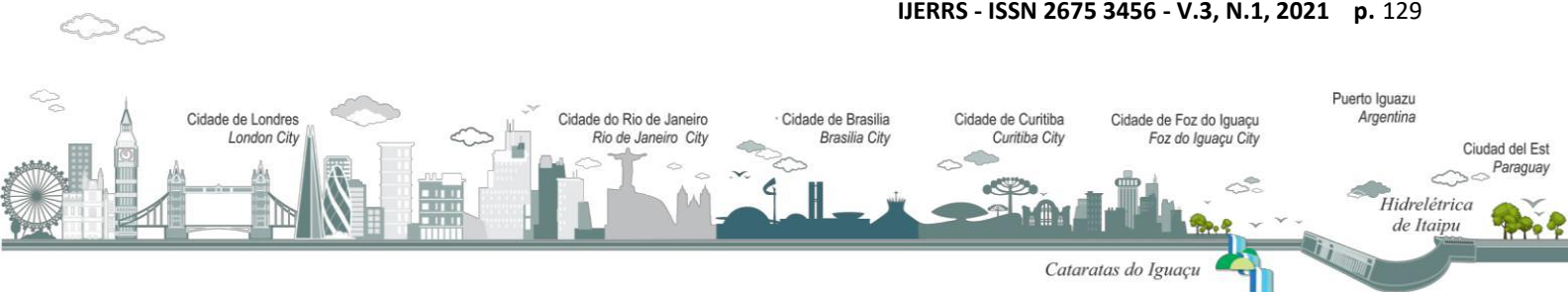
(average) of households have sewage service at an adequate level. In addition, marginalized and rural areas usually have precarious access to sewage treatment and garbage collection in comparison to urban areas, which would facilitate the spread of disease and pollution vectors on hydric resources, due to the existence of inadequate infrastructure.
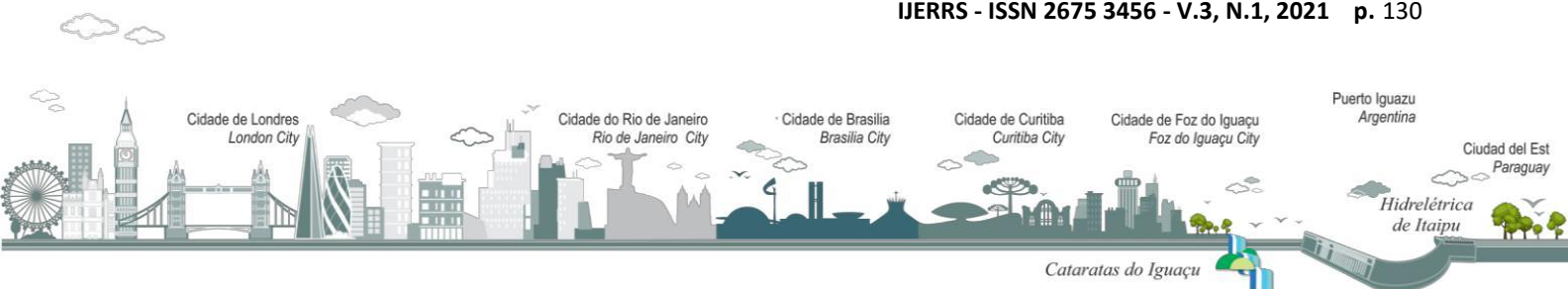
Chart 1: (Continuation)

Indicator		SMA	SAM	SAJ	SFX	SFP	SPU	SBA	VZD
Gender (%)	Male	48.7	48.0	47.2	48.8	49.7	48.1	48.9	49.8
	Female	51.3	52.0	52.8	51.2	50.3	51.9	51.1	50.2
Income (MW)	None until ¼	1,239	4,174	4,017	967	1,907	1,413	1,120	854
	> ¼ to 1	1,945	9,545	15,687	2,165	3,427	2,711	1,964	1,427
	> 1 to 2	467	2,333	4,871	427	446	468	295	327
	> 2 to 5	131	787	2,083	115	122	132	119	95
	> 5	61	192	792	31	47	49	27	15
Educational level (people)	NSIES	6,542	28,053	40,491	7,063	11,846	9,179	5,733	5,723
	ESIHS	1,851	7,221	13,590	1,827	2,758	2,214	1,170	825
	HSIHE	2,215	12,344	20,119	2,835	2,609	2,186	1,848	1,065
	HE	492	1,417	3,106	287	207	203	110	108
	DND	40	212	322	168	30	247	17	11
People age 15 or more not know read or write	Yellow	21	122	50	31	36	14	39	14
	White	49	358	1,334	185	590	168	83	249
	Indian	10	6	10	12	1	DNA	3	DNA
	Brown	509	2,405	4,521	904	1,831	1,039	566	1,135
	Black	597	2,679	2,715	504	1,081	760	547	410
Sanitation (%)	Adequate	11.4	53.5	62.6	56.8	8.1	3.5	27.1	18.0
	Inadequate	1.7	11.8	11.4	25.4	43.6	39.0	2.8	25.9
	Semi-adequate	86.9	34.7	26.0	17.8	48.2	57.5	70.2	56.1
Houses with piped water	Yes	3,658	14,709	25,820	2,926	5,119	3,936	3,422	2,398
	No	184	2,322	1,630	778	830	837	103	321
Fleet (unit)	Car	579	3,836	18,379	1,134	1,524	1,541	443	493
	Pickup truck	105	595	3,567	131	493	247	84	112
	Minibus	13	140	269	28	52	72	33	16
	Motorcycle	296	3,843	15,953	579	2,707	1,996	494	953
	Bus	11	161	209	19	56	40	3	30

Source: authors' conception based on several census[7] IBGE database.

Urban mobility and health service. Public transport is limited. In terms of urban

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[7] Population census and social indicators (2010), Agriculture (2017), Extractivism (2017), Fleet of cars (2016), Poverty map (2003), General data about Brazilian municipalities (2017), Social Assistance (2013), Productive inclusion (2014), Environment (2002), Sanitation (2010) and Municipal Gross Domestic Product - GDP (2016).

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mobility in municipalities the great number of cars and motorcycles and a small fleet of public transport vehicles, such as buses and minibuses stand out. About health services, the number of establishments varies from 3 to 76 units, with a small number to emergency care. This is carried out predominantly by National Health Service (SUS), mainly in municipalities with less financial resources and structure.

Economic activities. Main economic activities are related to use of natural resources, like agriculture, livestock and fishing. Cassava and maize production - very sensitive to CC effects - are really strong in the economies of these municipalities. Lastly, the commerce and services sector plays a strong role in the local economy.

Chart 2: Social data from municipalities of Recôncavo IT

| Indicator		CBP	CCH	CAL	COA	CDA	DMC	GMA	MGP	MZF	MTB
Territorial Area (km^2)		222.1	399.9	713.8	284.8	139.1	94.8	106.8	438.2	104.5	86.3
Estimated Population (people)		18,698	33,861	26,209	17,332	62,871	4,050	20,679	44,555	7,399	29,387
MHDI[8]		0.581	0.647	0.613	0.606	0.699	0.632	0.643	0.621	0.617	0.660
Gini Index		0.36	0.46	0.43	0.41	0.44	0.36	0.37	0.45	0.41	0.40
Health service unit	Generic	12	26	15	15	32	3	12	13	3	18
	Emergency	0	1	2	1	3	0	1	1	0	3
BTS[9]		DNA	DNA	DNA	DNA	1,64	0	DNA	DNA	2,50	DNA

Chart 2: (Continuation)

Indicator		NZE	SMA	SAM	SAJ	SFX	SFP	SPU	SBA	VZD
Territorial Area (km^2)		278.6	151.5	489.3	261.7	103.2	222.4	131.2	166,4	221,4
Estimated Population (people)		28,451	15,463	59,512	100,605	14,717	21,609	17,387	11,978	8,895
MHDI		0.641	0.617	0.646	0.700	0.639	0,616	0,614	0,617	0,586
Gini Index		0.43	0.37	0.44	0.49	0.43	0,40	0,40	0,38	0,35
Health service unit	Generic	18	5	35	76	10	6	11	5	5
	Emergency	1	1	5	2	1	1	2	1	0
BTS		0	DNA	0	DNA	DNA	DNA	DNA	3,47	DNA

Source: authors' conception based on several census[10] IBGE and CGU database (2018).

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[8] MHDI: Municipal Human Development Index.
[9] BTS: Brazil Transparent Scale
[10] Territorial area (2018), Estimated Population (2018), MHDI (2010), Gini Index (2003), Health Service (2009), BTS (CGU, 2018).
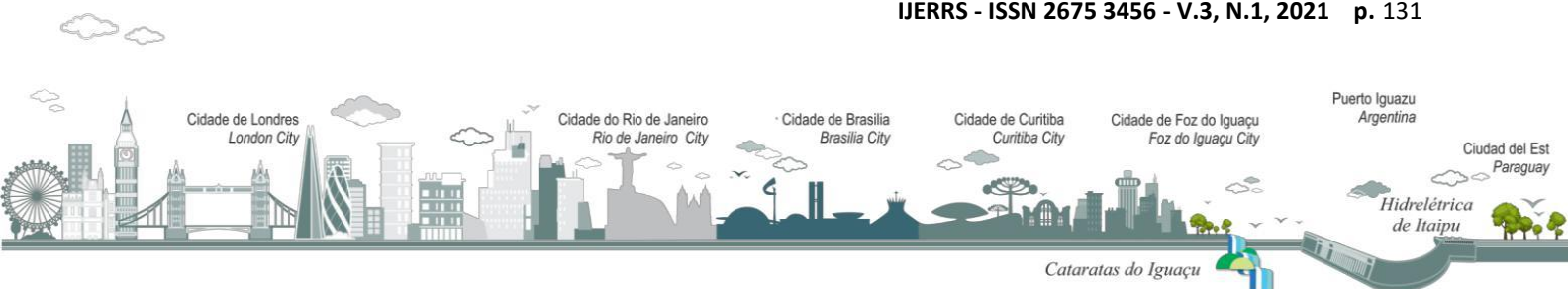
Accountability. Legal framework and climate instruments were not found in the database used. The most part of the municipalities were not included in Office of the Comptroller General (CGU), as a result, data about access to information requests and systems of transparency are limited, as shown in the Brazil Transparency Scale. In some municipalities' websites it was very difficult to find even cursory information about these data.

Based on all the information above, the urge to improve social and economic aspects toward the building of resilient cities is realized. That is, providing better services to attend primary public needs and develop economic alternatives for nature-based communities - specifically fishermen and familiar farmers. Moreover, specific measures to tackle CC need to be designed from now, not only in these sectors, in order to strengthen response readiness and the ability to adapt to these municipalities. Although an IBGE database was reported, some municipalities attended an indicator called 'Program of prevention against CC in livestock sector', for instance Cachoeira and Cruz das Almas cities, more details were not informed.

Challenges and opportunities to Recôncavo: SWOT analysis

Strengths versus Opportunities or Threats. The main considered opportunities (Chart 3) were training about climate change issues (TS = 10), partnerships and agreements (TS = 9). To avail them, the strengths are climate initiatives for livestock production and communication by radio or TV, both with TO = 9. On the other hand, the main threat recognized was extreme events (TS = 10). To better deal with it, the strengths are climate initiatives for livestock production (TT = 6), followed by productive inclusion actions and communication by radio and TV, both with TT = 5.

Weaknesses versus Opportunities or Threats. Similarly, the main considered opportunities were training about climate change issues and partnerships and agreements, both with TW = 9. However, the main weaknesses must be overcome to
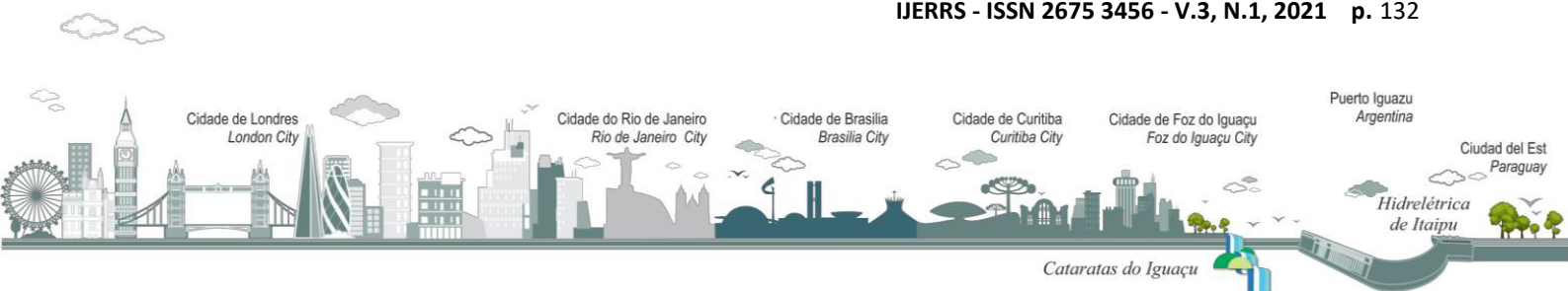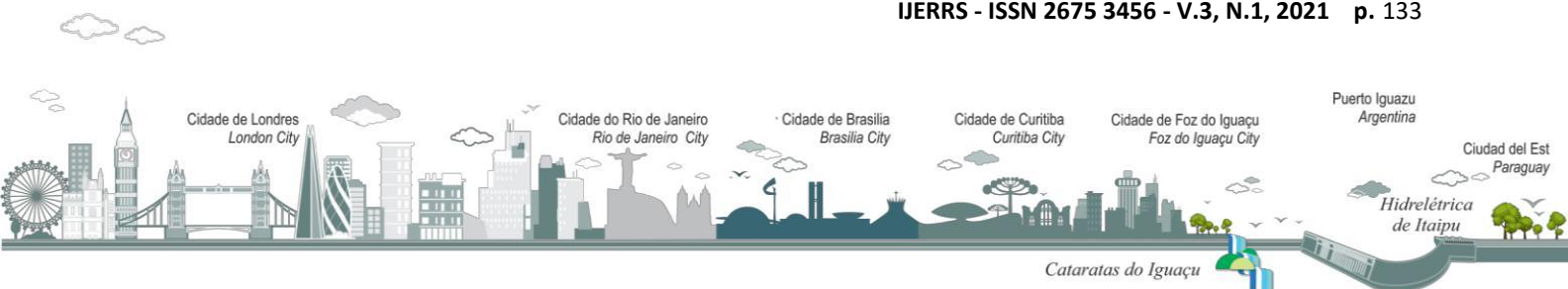
better avail these opportunities are the lack of municipal integrated database (TO = 11) and the articulation among municipal departments (TO = 10). Comparably, the great threats are extreme events (TW = 12) and budgetary constraints (TW = 11). Consequently, the weaknesses that need to be reduced or eliminated are the lack of municipal integrated database (TT = 9) and as well as inequalities of income and educational level, limited infrastructure, public services and articulation among municipal departments, both with TT = 8.

Chart 3: SWOT matrix[11]

Description	OPPORTUNITIES					THREATS				TI
1 – Little significant 2- Significant 3 – Very significant	External financing	Partnerships and agreements	Local climate forecasting	CC Training	TO	Budgetary constraints	Changing managers	Extreme events	TT	
STRENGTHS										
Productive inclusion actions	2	2	1	2	7	1	1	3	5	12
Climate initiatives for Livestock	2	3	2	2	9	2	1	3	6	15
Education level of the managers	1	2	2	3	8	1	1	1	3	11
Communication by radio or TV	2	2	2	3	9	1	1	3	5	14
TS	7	9	7	10	33	5	4	10	19	52
WEAKNESSES										
Inequalities of income and educational level	1	1	2	3	7	3	2	3	8	15
Limited infrastructure and public services	1	2	1	2	6	3	2	3	8	14
Lack of municipal integrated database	3	3	3	2	11	3	3	3	9	20
Articulation among municipal departments	3	3	2	2	10	2	3	3	8	18
TW	8	9	8	9	34	11	10	12	33	67
TGI	15	18	15	19	67	16	14	22	52	119

Source: authors' conception based on matrix model adapted from UNB (2011).

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[11] TO: Total Opportunities, TT: Total Threats, TI: Total of Impacts, TS: Total Strengths, TW: Total Weaknesses, TGI: Total of General Impacts (TS + TW).

Cidade de Londres *London City* Cidade do Rio de Janeiro *Rio de Janeiro City* Cidade de Brasília *Brasília City* Cidade de Curitiba *Curitiba City* Cidade de Foz do Iguaçu *Foz do Iguaçu City* Puerto Iguazu *Argentina* Ciudad del Est *Paraguay* Hidrelétrica *de Itaipu* Cataratas do Iguaçu

The analysis of the matrix SWOT points out that the development of training actions to share information and discussing main aspects related to CC (TGI = 19), besides the establishment of partnerships and agreements (TGI = 18) are the most relevant opportunities in this case. However, in order to reach goals related to climate adaptation in the study area it is necessary to improve climate both climate initiatives focusing on the Livestock sector (TI = 15), very important in this region and also the communication by radio or TV (TI = 14).

Although in current days it is very common the use of social media to share information and be connected with global news, the municipalities of the Recôncavo traditionally keep the use of radio and TV to communicate. As for the existing precarious infrastructure of telecommunication or for being more affordable to different public, regardless of their educational level, these means of communication can contribute towards the prevention and sharing of warnings and news related to the occurrence of extreme events and actions to prepare local communities to be ready for risky and disastrous situations, mainly in the absence of proper early warning systems.

Likewise, the promotion of actions to empower family farming to find out other alternatives for income generation contribute to reducing the social vulnerability regarding the dependence on natural resources, subject to environmental changes and their effects. Both initiatives incorporate the idea of using endogenous solutions to avail local elements and experiences to solve problems.

According to this matrix, the biggest threat to climate adaptation to Recôncavo is the extreme events (TGI = 22) followed by budgetary constraints (TGI = 16) and the biggest weaknesses that contribute to this are the lack of municipal integrated database (TI = 20) and articulation among municipal departments (TI = 18). As a result, these points are considered relevant challenges not only to support the decision-making process in the CC context but also to promote social participation and transparency in the monitoring of implemented measures to deal with this lately theme.
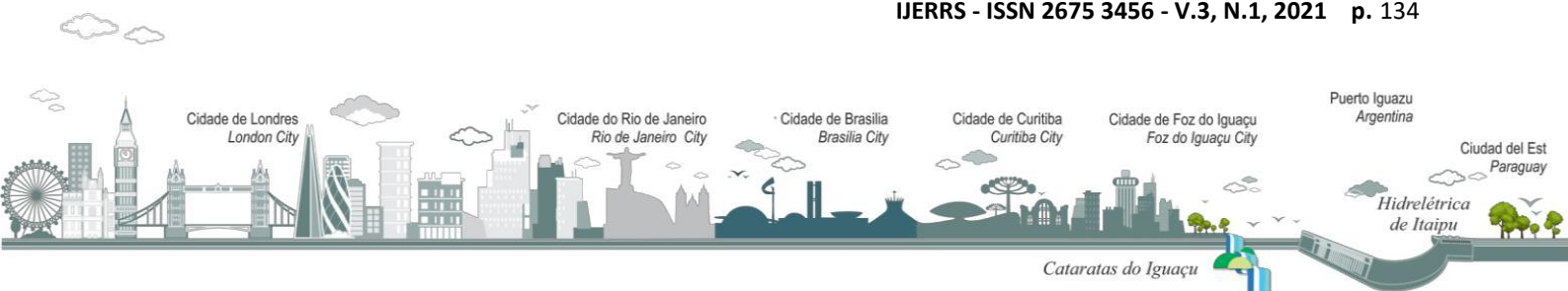
In addition, the promotion of more integrated actions among several municipal departments help in the reaching of municipal strategic actions more effectively, mainly under budgetary constraints.

Based on all information above mentioned, some measures are necessary to address the existing gaps and must be incorporated into local policies to deal with CC, reducing the existing weaknesses, developing strategies that might potentialize the existing strengths, such as the formation of municipal updated and integrated database to support decisions, besides partnerships in municipal, state and federal level.

Other measures might help Recôncavo IT to deal with CC are: incorporating CC issues on local planning; implementing the use of strategic planning tools like SWOT matrix to enlighten priorities and previous diagnoses, mainly when there are many problems asking for attention in the public agenda and the budget is limited; deploying actions to develop climate urban and resilience, providing better public services, especially concerning health care, transport infrastructure and sanitation. Lastly, improving socioeconomic conditions mainly to the most vulnerable people and sectors like family farming might avoid climate injustice with marginalized groups and areas.

CONCLUSION

The CC effects will reach society in different manners, and each one will face it differently. To better deal with it, definition of clear strategies and an detailed diagnosis of the existing barriers and potentials to tackle CC are important to guide the local decision-makers. This work points out the main opportunities and challenges found in the study area. Some limitations are mainly regarding the availability of municipal update data, basically affordable according to the IBGE database. At last, future works focused on how the climate approach has been included in other state and municipal planning in the mid-term and long term, might contribute to valuable insights to managers from Recôncavo IT. However, efforts and actions are need.
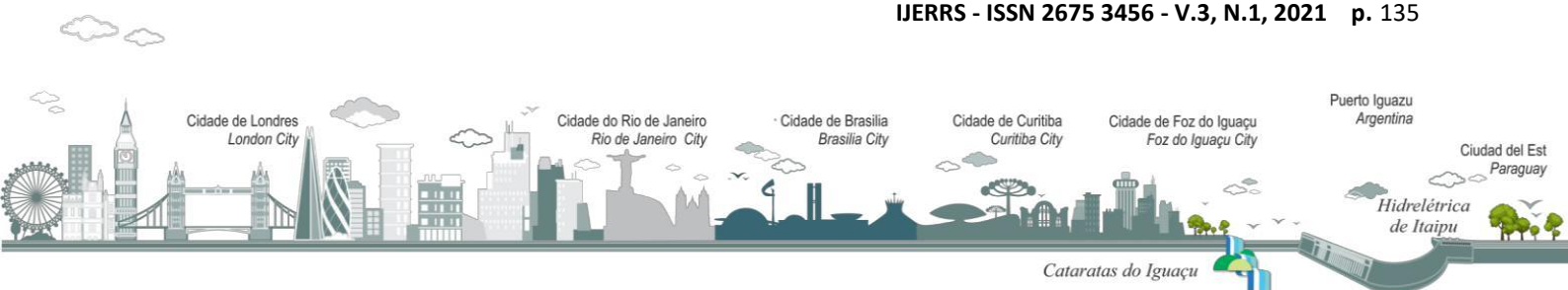
REFERENCES

ABDUL-RAZAK, Majeed; KRUSE, Sylvia. The adaptive capacity of smallholder farmers to climate change in the Northern Region of Ghana. **Climate Risk Management**, 17, p.104-122. jun. 2017.

ABEL, Dennis. The diffusion of climate policies among German municipalities. **Journal of Public Policy**, p.1-26, jul. 2019.

BROSKA, Lisa Hanna; POGANIETZ, Witold-Roger; VÖGELE, Stefan. Extreme events defined: a conceptual discussion applying a complex systems approach. **Futures**, 115, 102490, 2020.

CESANO, Daniele *et al.* Mudanças climáticas no semiárido da Bahia e estratégias de adaptação da coalizão Adapta Sertão para a agricultura familiar. **Inclusão Social**, Brasília, v. 6, n. 1, p. 88-104, dez. 2012.

CGU, Controladoria Geral da União. 2018. **Escala Brasil Transparente 360°**. Disponível em: https://relatorios.cgu.gov.br/Visualizador.aspx?id_relatorio=23. Acesso em: 20 fev. 2018.

IBGE, Instituto Brasileiro de Geografia e Estatística. 2018. **Dados sobre municípios e estado da Bahia**. Base de dados, diversos censos. Disponível em: https://www.ibge.gov.br/cidades-e-estados/ba/.html? Acesso em: 10 nov. 2018.

IBGE, Instituto Brasileiro de Geografia e Estatística. 2010. **Mapas municipais estatísticos do Censo 2010**. Base de dados. Disponível em: ftp://geoftp.ibge.gov.br/mapas_estatisticos/censo_2010/mapa_municipal_estatistico/. Acesso em: 29 jan. 2019.

FERREIRA, Luana Sena. **Adaptação às mudanças climáticas**: contribuições para o processo de formulação de políticas públicas e desenvolvimento de estratégias adaptativas ao Recôncavo baiano. 2019. 92 f. Dissertação (Mestrado) – Programa de Pós-Graduação em Gestão de Políticas Públicas e Segurança Social, Centro de Ciências Agrárias, Ambientais e Biológicas, Universidade Federal do Recôncavo da Bahia, Cruz das Almas, 2019. Disponível em: https://www.ufrb.edu.br/mpgestaoppss/dissertacoes/category/17-2019. Acesso em: 28 dez. 2020.

FUNTOWICZ, Silvio. From risk calculations to narratives of danger. **Climate Risk Management**, 27, 200212, 2020.

JURJONAS, Matthew *et al.* Uncovering climate (in)justice with and adaptive capacity assessment: a multiple case study in rural coastal North Carolina. **Land Use Policy**, 94, 104547, 2020.
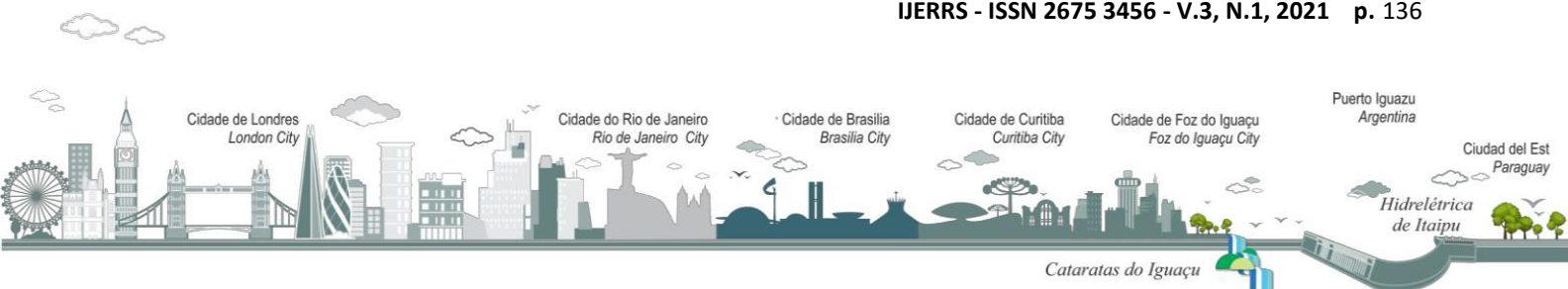
MMA, Ministério do Meio Ambiente. **Plano Nacional de Adaptação à Mudança do Clima**. Brasília: Ministério do Meio Ambiente, 2016. 2v. Disponível em: http://www.mma.gov.br/clima/adaptacao/plano-nacional-de-adaptacao#monitoramento-do-pna. Acesso em: 09 de fev. 2019.

MINARI, Nathália Bassoli; CARMO, Aline Borges. Vulnerabilidade às mudanças climáticas e o caso dos pescadores artesanais de Pontal do Paraná: entre o desconhecimento da questão climática a falta de políticas públicas adaptativas. **Revista Gestão & Políticas Púbicas**, São Paulo, v. 4, n. 1, p. 176-190, 2014.

SANTOS, Murilo Pinto Silva; ALENCAR, Cristina Maria Macêdo de. Educação formal e política territorial no Recôncavo da Bahia: conflitos da relação campo-cidade. In: CONGRESSO INTERNACIONAL FOMERCO, 16, 2017, Salvador. **Anais do Fórum Universitário Mercosul**. Salvador: Fomerco, 2017, v. 1, p. 1-15. Disponível em: http://www.congresso2017.fomerco.com.br/resources/anais/8/1507934835_ARQUIVO_MuriloSantos&CristinaAlencar-EducacaoFormalePoliticaTerritorialnoReconcavodaBahia.pdf. Acesso em: 21 fev. 2019.

SEI, Superintendência de Estudos Econômicos e Sociais da Bahia. 2017. **Banco de Dados**. Disponível em: https//www.sei.ba.gov.br/images/inf_geoambientais/cartogramas/zip/REG-BAHIA-TI_2017_06_14SHP.zip. Acesso em: 30 jan. 2019.

SEI, Superintendência de Estudos Econômicos e Sociais da Bahia. 2016. **Perfil dos Territórios de Identidade da Bahia**. Volume 2. Territórios Piemonte do Paraguaçu, Recôncavo etc. Disponível em: https://www.sei.ba.gov.br/index.php?option=com_content&view=article&id=2000&Itemid=284. Acesso em 05 nov. 2018.

UNB, Universidade de Brasília. **Versão preliminar**: Bases do Planejamento Estratégico: 2011 a 2015. Brasília: Decanato de Planejamento, Orçamento e Avaliação Institucional, 2011. Disponível em: http://dpo.unb.br/images/phocadownload/documentosdegestao/planodesenvinstitucional/Bases_2011-2015_preliminar.pdf. Acesso em: 01 mar. 2021.

YOHE, Gary; TOL, Richard S. J. Indicators for social and economic coping capacity: moving toward a working definition of adaptive capacity. **Global Environmental Change**, 12, p. 25- 40, 2002.

YOUNG, Andrea Ferraz. *et al*. The role of nature-based solutions in disaster risk reduction: The decision maker's perspectives on urban resilience in São Paulo state. **International Journal of Disaster Risk Reduction**. 39, 101219, 2019.