THE ENVIRONMENTAL DIMENSION OF SLUM UPGRADING

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1. Introduction

A great share of the population who inhabit metropolitan regions live in slums and a significant part of this occupation takes place in areas that are environmentally sensible and protected by law. The development of slums originated, historically, in the Brazilian process of urbanization, absorbing local or regional characteristics. They are inherent to the process of development of unequal cities, that is, houses and urban infrastructure aren't equally distributed in the territory, remaining concentrated in areas where the land is expensive and higher income people live.

In the city of São Paulo, according to data from the 2016 Municipal Housing Plan, there are 445,112 households in slums and 385,080 in clandestine or irregular settlements. Out of this total, 684 settlements are occupied by 171,771 households, all of them located in Areas of Protection and Recovery of Water Sources (APRWS), in the Guarapiranga and Billings basins[3].

In 2016, in the Greater ABC region, 835 settlements of social interest[4] with 203,874 households were identified. Among them, 788 were classified as precarious settlements representing 190,194 households. In the Billings APRWS there are 267 Settlements with 61,983 domiciles, that is, 32% of the total of settlements of social interest. We also observed the presence of water courses in 398 settlements of social interest (CONSÓRCIO…, 2016).

These situations exemplify the socio-environmental and space inequality of the metropolis. The dimension and complexity of the problem require, for its confrontation, recognition of the socio-environmental conflicts and the adoption of an interdisciplina-

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3. Data calculated by Gilmara da Silva Gonçalves (Researcher of the Laboratory of Urban and Regional Studies and Projects / UFABC), along with GIS (Geographical Information System) based on the Slums and Allotments Database (2000-2010) from the Centro de Estudos da Metrópole, available at: http://www.fflch.usp.br/centrodametropole/1288, accessed in 03/22/2017.

4. Settlements of social interest are defined as areas inhabited by low income population, corresponding to urban and precarious areas added up.

ry approach to intervention projects, that is, the development of solutions that aim at environmental qualification and ensure the right to housing.

Considering that there's greater recognition of the importance of managing the environmental dimension in slum upgrading by the players involved in the projects, this paper aims at discussing the developments, limits and conflicts that take place in practice. Two issues stand out in this debate. The first one refers to the management of the environmental dimension in the projects and works for precarious settlements defined as slums and irregular allotments located in consolidated urban areas that are occupied by lower income population. The second, to the enforcement of the new regulatory frameworks that promote the regularization of the settlements located in environmentally protected urban areas.

Studies that assess some pioneering experiences of slum upgrading carried out in the Greater ABC Region are used as references for the analysis. The Greater ABC Region is located in the São Paulo Metropolitan Region. It comprises the cities of Santo André, São Bernardo do Campo, Diadema, São Caetano do Sul, Mauá, Ribeirão Pires and Rio Grande da Serra. It is home to 2,5 million inhabitants who are distributed in 865,145 households (IBGE, 2011), 25% of which are located in precarious settlements. In order to broaden the analysis, examples of experiences carried out in São Paulo are going to be included.

2. Reflections on the possibilities of conciliating the urban-environmental theoretical and practical spheres.

Environmental problems are inseparable from social, involving economic, cultural and political dimensions, reaching different scales of space production and reproduction.

Analysis developed in the field of political ecology, which are based in the social production of nature, contribute for the construction of an integrating and intersectoral approach. That is, humanity and nature transform each other mutually and in this sense, it is necessary to question the opposition between nature and culture (LIPIETZ, 2002, p.19). Erik Swyngedouw (2009, p. 102) addressees the inseparability of society and nature and discusses a concept of socionature that would be grouded in the idea that "[…] social relations operate by metabolizing the "natural" environment, through which both society and nature are transformed and new socio-natural forms are produced".

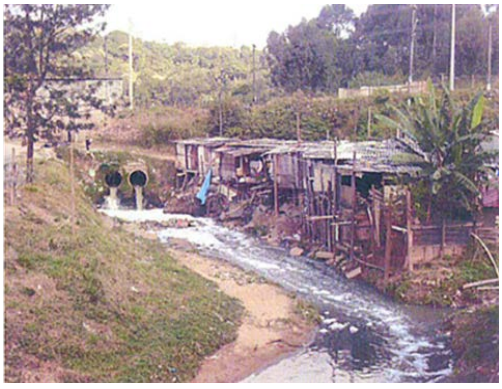
However, according to Swyngedouw and Heynen (2003) the recent literature on political ecology has given little attention to the urban as a process of socio-ecological change. Therefore, it's necessary to recognize its centrality in the discussions about the origins of many environmental problems. In the same way, the literature on technical aspects of urban environments fails when recognizing the close relationship between antinomies of the capitalist process of urbanization and social injustices. In any case, it's no longer possible to deny that "environmental" topics have been central for urban transformation and for changes in urban politics in the past century. This urban metabolism is made evident by the slum and its upgrading processes.

The grounds of the debate about the environmental inaquality of slums as opposed to the other spaces of the city is a dispute for access to land in a context of capitalist urbanization, where the increasing real estate appreciation and concentration of private property are combined to a background of unequal production and access to infrastructures. The socioespacial segregation produced by the dynamics of the land market, which prevails over the rules of law, engenders environmental inequalities (ACSELRAD, 2009; MARICATO, 2010).

With regards to the management of urban-environmental conflicts, the perspective that does not disconnect nature changes from space production in capitalism, and is not limited to understanding the enviromental dimension as environmental protection independent from the context of social inaquality, is not hegemonic nor homogeneous among the public and private players involved in slum upgrading.

Luz (2013) analyzes the process of implementation of the Canivete Linear Park, as part of the "100 Parks Program". The project was promoted by the City of São Paulo during Gilbert Kassab's (2008-2012) time in office. It aimed at the environmental recovery of water courses, valley bottoms and areas of permanent preservation (APP) in floodplains susceptible to flooding, which put at risk the families who lived in riversides in precarious settlements. To build the park 527 families of the Jardim Damasceno slum were removed. A total of 343 received "compensation" (money for housing support) of R$ 5,000, 00 and 21 families of R$ 8,000, 00, sums that do not allow access to a formal and decent home. The study shows that the right to housing was not respected.

Figure 1- Canivete Linear Park before and after interventions



Precarious houses along the river before the construction of Canivete Linear Park. Source: Fabiana Luz (2013), Secretary of Housing of Sao Paulo. "Demandas Especiais", 2006.

Canivete Linear Park, Jardim Damasceno – São Paulo, 2011. Picture: Luciana Ferrara.

Society, government sectors and the judiciary reproduce the environmental discourse intending to promote or maintain the socio-spatial segregation and meet the interests of the real estate market over social interest. Compans (2007) describes that the City of Rio De Janeiro, during the 90's, loosened the municipal legislation to enable the

implementation of residential condominiums by the real estate market in urban sectors of the city that determined slums to be removed. The author affirms that the offensive against the inhabitants of slums had significant participation of the State Public Ministry through the Environment Prosecutor's Office, motivated by the accusations of a Newspaper.

In practice it's evident that the environmental protection narrative is materialized in a contradictory way when it comes to the implementation of slum upgrading programs. This is because such programs don't always ensure full right to housing or achieve the appropriate environmental and urban quality.

For Costa (2008) the difficulties and hindrances of an articulated urban and environmental action are also associated with the origin of environmental and urban planning, which were developed based on different rationales. While urban policies inherited a predominantly function-oriented modernist planning, which perceived nature based on its utilitarian and economic aspects; environmental policies were grounded in the symbolic dimension of nature and on the need of its conservation, since it considered urbanization as inherently destructive. These distinct logics were incorporated to their corresponding policies. Despite the "convergence of views" related with principles of social justice, participation and sustainability, the conflicts regarding urban-space production and the antagonic interests on the objective of policies were not eliminated (COSTA 2008, p.81).

In the field of urban policies, Acselrad (2010) considers the "environmentalization" encouraged by the international debate of the 90's as responsible for the movement of institutionalization and articulation of groups who took different positions and started to influence governments. There were those who criticized the model of economic development and defended people's rights, as well as those who believed in the ecologic modernization of Brazilian capitalism (ASCERALD, p.105). This makes evident that tensions remained present.

Travassos and Silva (2008, P. 28) point out two aspects that led urban and environmental policies not to produce positive concrete results: the distance between discourse and practice in real life, and the "[…] incapacity [of the public power] to create public policies that take into account not only the effect – environmental, social and urban degradation –, but also its causes – the forms of production of urban space".

In the sense of urban environmental justice and democratization of the city, upgrading slums considering the environmental dimension acquires, beyond the technical and interdisciplinary aspects, a political and social meaning. Although it's possible to identify an increasing environmental concern in slum upgrading, there are conflicts and tensions in the articulation of the urban and environmental agendas (MARTINS, 2006), which points at the need to continue this debate.

3. Environmental qualification in the upgrading processes of precarious settlements in light of government action

Slums, with or without intervention, were consolidated as permanent dwelling spaces. And the most common type of intervention started to be their upgrading, having as its main protagonist the City government. The 1980's marked the beginning of the

institutional development of slum upgrading policies, opposing the logic of eradication and displacement to distant places. In the 1990's, many cities that had slums started to develop upgrading and regularization programs as part of municipal housing policies (DENALDI, 2003).

In the 80's, municipal action was characterized by "the emergencial" intervention aiming at promoting, to some extent, the improvement of infrastructure (opening alleys and carrying out sanitation networks), with projects almost always performed *in loco*, focusing on the limits of the area occupied by the slum in most cases, (DENALDI, 2003, P. 191). The policies conceived in this period were directed at legally recognizing land ownership and ensuring "minimum social rights", like access to sanitation.

The construction works were carried out with municipal resources, since funds granted by the State and Federal spheres were nonexistent. Actions like the construction of new houses and housing requalification were not developed. The environmental dimension was undermined. Overall, the interventions performed did not dialogue with strategies of environmental and urban improvements of a sector of the city.

To illustrate this matter, Denaldi (2003, p.97) approaches the role played by the City of Diadema in this period, where it was common to open the main road on top of a canalized stream and discharge the sewer in it. He mentions the example of the Nações slum, where many interventions did not consider the morphologic characteristics of the land. Lots and homes were consolidated on top of draining lines, which resulted in water impoudment and flooding of the area during rainy periods. For this reason, he concluded that many interventions carried out in the city during the 1980's exacerbated the environmental problems and consolidated inadequate housing conditions of and ground fragmentation.

In the following decades, the interventions started to be improved, with developments in the conception of policies and elaboration of slum upgrading projects. The projects for slums acquired greater value, norms for carrying out and hiring upgrading services were defined, which, to some extent, enabled improvements in the quality of the interventions. The set of actions involved in the urbanizations was extended. The perspective of integrating the slum to the city reinforced the recognition of a broader right to the city and led to the development of projects and management models that focused both on the slum and the city (DENALDI, 2003).

Although the discourse does not always coincide with practice, the environmental dimension started to be valued in slum upgrading programs. Evidence of this fact is the decision to fund and incorporate the 'environmental requalification' as a component of the projects, as well as the recommendation to consider the water basin as a unit when it comes to planning and managing interventions. Moreover, when choosing to give priority to areas where social, urban and environmental problems overlapped, the Public Power somehow started to recognize this typology of precarious settlements as a socio-environmental problem.

Programs with the objective of recovering water source areas that were environmentally protected were also launched. As of the 1990's, it was possible to carry out interventions due to international funding, granted specially by the Inter-American

Bank of Development and the World Bank. Some examples are worth mentioning: the program of Environmental Sanitation of the Guarapiranga basin in the city of São Paulo; the Novos Alagados Program (CITIES ALLIANCE, 2008) in Salvador, and the interventions carried out by the Prometropole program in the Beberibe basin in the metropolitan region of Recife.

In the federal sphere, slum upgrading was included in the agenda in the 1990's, with the Brazil Housing Program (Programa Habitar Brasil) prepared during Itamar Franco's (1991-1994) term in office and restructured durng Fernando Henrique Cardoso's (1995-1998) first term. During FHC's second term, in 1999, an agreement for developing the Brazil Housing Program [Programa Habitar Brasil/BID (HBB)] was signed with the Inter-American Development Bank. The topic of environmental recovery was included as one of the objectives of the second phase of the program (BRAZIL, 2008, p.17).

The publication 'Habitar Brazil BID' (2008) addressed this program highlighting the importance of interventions in Permanent Preservation Areas (PPAs) located in water bodies within urban areas and pointed out that the type of urbanization adopted relied upon many factors, like the level of consolidation of the settlement and its size; and role of the water body. It described that in some cases the funded interventions removed settlements from certain areas and replanted native vegetation. In other cases, leisure areas and public equipment were built or even the occupation was consolidated (BRASIL, 2008, p. 67).

In 2007, the federal Government launched the Growth Acceleration Program – Precarious Settlements Urbanization (Programa de Aceleração do Crescimento - Urbanização de Assentamentos Precários/ PAC-UAP) which led to an increase in the scale of slum intervention in Brazil. Among the objectives of the program there were initiatives to mitigate environmental damage and to decontaminate. That is, 'Environmental recovery' became a type of intervention to which investments were allocated and a criterion that was prioritized when selecting proposals (BRASIL, 2010, P. 32).

Despite the problems resulting from the works, there are accumulated experiences of slum upgrading processes with parameters that differ from the legally established ones. (BUENO, 2000, 2002; SAMORA, 2011). However, in relation to environmental parameters, the pursuit to conciliate upgrading with environmental gain is a more recent debate (FERRARA; MARTINS, 2014).

There isn't a set of specific parameters to promote or verify the recognized and practiced environmental gains. But, it is possible to say that the improvement in environmental conditions is related to a set of actions: supply of integrated sanitation; recovery of water courses margins; increase in the percentage of common and free areas; density adequation and elimination of insalubrity; expansion of permeable areas; elimination and recovery of risk areas.

The knowledge accumulated through the experiences, as well as the developments related to designing the programs that financed the upgrading of precarious settlements led to improvements in the interventions. However, they didn't always achieve satisfactory quality. There are indications that, in practice, it is necessary to improve the quality of the

projects and ensure their fullfilment during the interventions to promote the adequate environmental and urban recovery of the settlements.

Research carried out by Moretti et al (2014) analyzed upgrading projects and works carried out in the Region of the Greater ABC and financed by the PAC-UAP by defining quantitative and qualitative descriptors. It concluded that access to the official supply of drinking water, sewage collection and electricity supply is a goal that was already being achieved by slum upgrading projects. However, the interconnection of the collected sewer to the main system of collection and treatment was still missing.

This study points out that the goal of expanding the percentage of areas of common use and with vegetation wasn't reached in most of the projects that established the creation of small permeable areas, designed for open spaces and leisure activies. In all the cases, there was no success in requalifying the households located in areas that could be consolidated or reducing the excessive density and insalubrity. The best indicators found referred to settlements with high percentages of families' removal and tissue replacement, as is the case of Jd. Santo André settlement, in the city of Santo André. In this case, the intervention became more similar to those that propose the construction of new undertakings.

The goal of eliminating situations marked by risk was reached in most of the cases through the removal of families and execution of works like: draining, geotechnical contention, re-sloping and revegetation. However, it was possible to verify that the geotechnical solutions of the project were generic, disconnected, and many times incoherent with the reality of the physical-urban environment. The topic of the recovery of water courses' margins and water source areas was addressed through different strategies.

These results are related to a series of aspects: limited institutional capacity of the cities; specific characteristics of the occupation of these territories; low quality of projects and works; and insufficient resources to fully implement intervention. These settlements had high degrees of complexity, due to their physical characteristics and type of occupation. Such situations require complex physical interventions and well elaborated projects (DENALDI et. al, 2016, p.111) whose works are fully performed.

Based on case studies, it was possible to verify that the projects weren't always based on integrated diagnosis. They were frequently incomplete and had an insufficient level of details. With some exceptions, it is still clear that when the upgrading is projected and/or performed in a fragmented way, it does not achieve the necessary quality. Furthermore, the disarticulation with specific projects compromises the urban and environmental solution. The authors highlight that the project is undermined by the execution of works, which do not always respect their definitions.

Treatment of water courses is an element that deserves special attention, because of its structuring role in slum upgrading. It is connected with infrastructure solutions and directly related to housing solutions and house removal, be it due to risk mitigation in areas that can't be consolidated or to the need to implement sanitation pipelines and networks.

It's worth mentioning that there are water courses in most of the precarious settlements located in metropolitan areas. In the case of the Greater ABC Region, out of the total of precarious settlements, about 49% have APP of the type stream margins. (CONSÓRCIO..., 2016, p.127).

Overall, since 2009, the legislation that regulates urban land of social interest[i] has been loosening the definition of the width and management of APPs of the type water course margins if there is a specific diagnosis demonstrating the current situation of the settlement and its degree of consolidation. Analyzing the stream beyond the area of the slum, downstream and upstream, must guide the decision on the type of intervention that can be performed in the water body, as well as the number of family removals, which, many times can be such a small number that it's not worth the movement.

The dimension and complexity of the problem indicate that it's impossible to adopt the removal of families who have built their homes in these areas as the only alternative. However, one recognizes that consolidating these settlements (or parts of them) taking into account only urban and social aspects in not a solution. In some cases, it is impossible to consolidate and regularize the settlements due their extreme precariousness and presence of risks that can't be remediated. Therefore, the APP has to be recovered and the families have to have their right to housing ensured in a different location. In other cases, it is possible to combine upgrading and consolidation of the occupation, with environmental qualification. However, to do so, it is necessary to make urban and environmental instruments compatible and develop special projective parameters.

Slow changes have been taking place in the way water courses are handled from a technical point of view. Instead of closed canalizations, opened ones start to be made, with the use of different materials. More recently, the recovery of stream margins has been associated with the construction of linear parks, restoring their margins and creating areas of collective use where there used to be houses. Interventions like these have to be combined with sanitation solutions (implementing sewage collecting trunks) and water treatment, as well as the maintenance of both services, which are aspects that influence the quality and possibilities of appropriation and use of such spaces.

These issues become even more complex when the settlement is located in Areas of Protection and Recovery of Water Sources (APRWS). Taking as example the Guarapiranga and Mananciais Programs, despite the invested resources, it's possible to verify that the upgrading works didn't help to improve the quality of the water of the dams. This is because the sewer collection networks were not completed and the sewage kept being discharged directly in the water bodies - problem that also derives from the incomplete character of the metropolitan sewer treatment system. Although the interventions prioritize environmental sanitation, which is central to public health, the model of intervention is based on sectorial actions that are little articulated, consolidating large numbers of houses in precarious conditions. It's also worth mentioning the lack of environmental criteria to select and prioritize the precarious settlements that integrated the Program from 1992 to 2016, ignoring the specificities of the region for water production (FERRARA, 2013).

4. Regulatory frameworks to promote 'Land Regularization of precarious settlements': developments and dilemmas

Before the approval of the new legal frameworks that will be addressed bellow, the 1965 Forest Code (Law n. 4,771/1965) and its complementary legislation were the main

references for a desirable standard of environmental protection. However, they were difficult to apply on the socio-environmental liabilities of Brazilian upgrading overall and, especially in precarious settlements. Developments regarding the production and review of regulatory landmarks of urban and environmental policies opened new paths.

The City Statute (Law n. 10,257/2001), main regulatory framework of urban policy, defined land regularization as a matter of right and provided Special Social Interest Zones (SSIZ) as the main instrument to promote upgrading and regularization. The Law of the Program My House My Life/MHML (Law n. 11,977/2009) addressed the Land Regulation of Precarious Settlements in its correct scope and established instruments to promote it, like the Urban Demarcation and the Ownership Legitimating, which enabled the City executive branch to perform regulating actions that used to be exclusive to the judiciary.

When located in environmentally protected areas like APPs and APRWS, Land Regulation of Precarious settlements had to comply with urban norms and environmental regulatory frameworks. As of the edition or review of the regulatory frameworks, a new approach started to be adopted, recognizing the socio-environmental aspect of the territories and irreversibility of the settlements occupied by lower income population. It also allowed land regulation of precarious settlements in environmentally protected areas when combined with initiatives of environmental improvement and recovery.

The "new Forest Code" (Law n. 12,651/2012) validated content of the Law of the MHML program, permitting land regulation of precarious settlements in APPs. It is worth pointing out that this content was already present in the CONAMA Resolution nº 369 of 2006, which addressed exceptional authorization to promote the regularization of precarious settlements like slums in water bodies APPs. However, this resolution had little practical effect (SANTOS 2007; 2012 and DENALDI; JODAS, 2014).

In the State sphere the management of water resources by water basins was introduced by Law nº 7,663 of 1991. In the state of São Paulo, Laws nº the 898/1975 and nº 1,172/1976 instituted Areas of Protection of Water Sources and disciplined the use of the ground; and Law nº 9,866 of 1997 established intervention areas aiming at protecting and recovering the protected basins, recognizing the environmental attributes and preexistence of urban occupations. This law provided the elaboration of the Plans of Environmental Development and Protection for the APRWS of the Metropolitan Region of São Paulo, allowed the execution of emergency works and recommended the draft of specific legislations for each sub-basin. For Alvim, Bruna and Kato (2008), the legislation enabled land use definition and occupation taking into account the socio-environmental and peculiar characteristics of each territory, with an interesting proposal of institutional arrangement.

After this legislation was published, three specific laws were drafted until the present day: the Specific Guarapiranga Law n. 12,233/2006, the Specific Billings Law n. 13,579/2009, the Specific Alto Juquery Law n. 15.790/2015, The Specific Alto Tietê Cabeceiras Law n. 15.913/2015 and The Specific Alto Cotia Law n. 16.568/2017.

The Specific Guarapiranga Law and the Specific Billings Law established a new instrument called Program of Recovery of Social Interest (PRSI). It was a plan of environmental regularization and recovery of a settlement delimited by the city as SSIZ,

which had to submit its license to the approval of the Cetesb - State of São Paulo Environmental Company.

However, reviews of the regulatory frameworks still haven't promoted significant results. The reasons for this can be the difficulties to apply the instruments, which are related to the little institutional ability of the cities; lack of transparency regarding the attributions and skills of all the stakeholders involved in licensing process; and resistance of environmental teams and departments, which interpret the law in a restrictive way.

In practice, permitting land regulation of precarious settlements in APPs, as indicated in the "new Forest Code" (Law 12,651/2012), is not duly accepted, even in cases where the environmental diagnosis proves that it could be allowed. Lopes (2015), analyzing the situation of the Greater ABC Region, points out that Cetesb interprets that the intervention or suppression of native vegetation in APPs would only be possible in cases of public use, and that it does not apply for cases of social interest like land regularization. Cetesb also tends to apply the norm in a more restrictive way, not including the alternatives created by the recent legal situation. According to the author, federal law 11,977/2009 is not applied. CONAMA resolutions are used instead and they define more restrictive limits for regularization in the APPs. The lack of consensus between licensing agencies and city governments regarding interventions in APPs is an obstacle to promote the environmental regularization and recovery of settlements.

This restrictive interpretation was already practiced when the CONAMA Resolution n. 369 of 2006 was edited, according to a study conducted by Denaldi and Jodas (2014). They analyzed land regularization of the Jd. Cristiane settlement, located in the City of Santo André, along the margins of the Taioca stream. The process of regularization started in 2006 when it was defined as SSIZ. The environmental licensing process began in 2005 to fulfill the demands of the National Bank for Economic and Social Development (BNDES), which financed part of the planned works, like: construction of the sewer collecting trunk; open air canalization of the Taioca stream; opening of Taioca marginal road; implementation of public infrastructure networks and services; construction of 350 new housing units; elimination of risky situations.

The environmental permission for canalizing the stream and building the road was issued in less than 6 months and the authorization for the upgrading, which began in May 2007, hadn't been issued by the end of 2012. As this was the condition to get the fund, the urbanization construction works in the area were paralyzed, the sewer collecting trunk was being built at a very slow pace, therefore, the sewage of the settlement and neighborhood kept being discharged in the stream and houses remained precarious.

The Specific Billings Law came into effect in 2009, but there was little progress in land regularization of settlements located in APRWSs. The Regional Housing Diagnostic of the Greater ABC (2016) revealed that the cities of the region had started the environmental licensing with Cetesb of only 42 out of 243 slums located in the Billings basin and, until June 2016, no licensing of the PRSI had been completed.

With regards to the environmental licensing procedures ongoing along with Cetesb, until July 2016, the cities had been granted the following licenses: 3 settlements in Diadema got License of Installation (which enables the beginning of construction works);

2 settlements in Mauá got License of Installation; Santo André got a Previous License (the first license issued by the environmental agency to allow the project to be further developed); in São Bernardo, 19 settlements got a Previous License and 7 a License of Installation. The city of São Bernardo do Campo concluded, in December 2016, only one process of land regularization as part of the PRSI, of the consolidated plot of land called Vila Guarani, but the procedure had began in 2012.

These are time-consuming processes. In the case of São Bernardo do Campo, the processes of regularization of settlements where no construction works were needed took from 20 to 31 months and the City only obtained the Previous License (PL), which is the first stage of the environmental licensing. In processes that included infrastructure works, this time ranged from 24 to 60 months. In the case of Diadema, and using as reference two situations where it was necessary to perform infrastructure works, the License of Installation (LI), which allows the constructions to begin, was issued after 48 months.

After the approval of the Billings Specific Law in 2009, Cetesb published, in 2011, a Manual of procedures of the PRSI, which made the acquisition of licenses an even more complex process. The complexity and slowness of the licensing processes mobilized the cities of the Region, which articulated with each other creating the Greater ABC Intermunicipal Consortium. According to Lopes (2015), in 2011, the Consortium presented its Metropolitan Agenda to the State Government, indicating as a priority the revision of the procedures to acquire environmental licensing in precarious settlements located in the Billings APRWS. The topic was chosen as a priority because the licensing deadlines were putting at risk the federal funds raised - especially those done through the PAC-UAP - to perform upgrading projects of precarious settlements in the region.

With regards to the PRSI licensing, the demands were restricted to the requirements of the Billings Specific Law. One of the obstacles pointed out by the cities was Cetesb's demand to prove the public domain of the plot of land subject to the PRSI. This demonstrates lack of knowledge of the nature of the problem and articles provided for in Federal legislation regarding regularization of private areas.

After the articulation of the cities, a Working Group in partnership with Cetesb was created. It resulted in Resolution nº. 25 of 2013, which established licensing procedures for the PRSI. As the requests for licensing progressed other issues emerged, demanding further review. This was because of the diversity of situations of precariousness and consolidation of settlements located in the APRWSs. It wasn't always necessary to perform complex construction works and in some cases it was just necessary to regularize the land. Those issues were included in Resolution nº. 21 of 2017.

However, there is still much to discuss about the PRSI and environmental licensing procedures. Ramalho (2013, p.165) points out that the slowness and low efficiency of environmental licensing, in the case of precarious settlements stems from "the detachment between the situation for which it was conceived, that is, to evaluate potentially polluting undertakings beforehand, and the reality of precarious settlements, where environmental degradation is already in place". For the author, it would be necessary to apply specific rules focused on the environmental and urban adequacy of precarious and irregular settlements.

When studying the environmental licensing of the Alvarenga Peixoto settlement in Sao Bernardo do Campo, the author identified several negative impacts resulting from it. Although the long time for approval was not the only factor that generated delays, it was decisive in this case. This generated social impacts in the lives of the people who would benefit from the works because there was a mismatch between the upgrading works and construction of homes to enable the removal and resettlement of the families. The housing units built in the Três Marias Housing Estate had been completed and the upgrading works and removal actions couldn't be initiated because the licensing process had not been finished. The situation of environmental degradation was postponed and the granted resources were not optimized.

Figure 2 – PAC Alvarenga project before and after interventions

Status of the stream and houses before the upgrading in the Alvarenga PAC (Growth Acceleration Program). Source: Secretary of Housing, São Bernardo do Campo.

Upgrading of Sítio Bom Jesus, one of the intervention areas of Alvarenga PAC, São Bernardo do Campo, 2015. Picture: Luciana Ferrara.

Moreover, the procedure proved to be limited to increase the environmental quality of the interventions. The projects presented in 2007 had to wait six years for the completion of the licensing processes and were approved exactly how they have been designed.

It is worth highlighting that given the diversity of regional and national situations, it is not about consolidating or regularizing any and all types of occupations and indiscriminately flexibilizing approval procedures. It's about applying the legislation, when the integrated diagnosis verifies that consolidation is feasible, aiming at solving the problem and not reproducing processes of precarious occupation.

Conclusion

Today, there are millions of people living in precarious settlements located in environmentally protected areas in metropolitan regions. This reality expresses the socio-environmental inequality. The dimension and complexity of the problem show that it

is not possible to impose the total removal of families as the only alternative, using the environmental issue as a reason. It is necessary to seek alternatives to combine, when possible, the upgrading and consolidation of occupations with environmental and urban qualification.

The policies that regulate the upgrading of precarious settlements have been improved, but challenges to increase the quality of the interventions and to promote 'sustainable land regularization' still remain. It is also necessary to improve the quality of diagnosis, projects and works; develop special projective parameters, design integrated infrastructure, public space and housing solutions, according to each context, expanding urbanization beyond the fabric of the slum.

Infrastructure solutions, particularly sewage collection and treatment networks, as well as water bodies' drainage and treatment solutions, show the difficulties of interconnecting and expanding these networks beyond the local scale, as they depend on the operation of systems that extrapolate the micro basin where the settlements are located reaching the metropolitan scale. To address this problem, municipal and state public agents have to articulate to give priority to the environmental sanitation of precarious settlements. The long-term sewage treatment plans elaborated by Sabesp, which are frequently postponed, have to be carried out in order to break the cycle of pollution of urban waters.

Another challenge is conciliating upgrading and the Right to Housing, with environmental gains. Over the past decades settlements in Water Source areas were consolidated, became denser and, many times, vertical. Actions like density adequacy and recovery of protected areas like APPs, overall, require a high percentage of removal and resettling, which is an initiative of great social impact and relies upon land availability and subsidized funds for building new houses. In general, and taking as reference the experiences conducted in the Greater ABC Region in the past decade, there has been an improvement in the indicators, that is, the percentage of removals increased and new solutions for partial replacement of the urban fabric started to be proposed. But this alternative is difficult to implement and, depending on the solution proposed, can increase the conditions of socio-economic vulnerability of the families. Social work is another key component of the processes of upgrading and removal.

It is also challenging to apply the legal and institutional frameworks related to urban and environmental policies, particularly those directed at land regularization. The environmental licensing procedures for informal settlements in APPs and APRWSs, for example, are extremely time-consuming and difficult to complete, negatively impacting the progress of projects and, therefore, the possibility of constructing solutions that generate environmental gain, according to each context.

In the case of the State of São Paulo, the new legislation for water sources hasn't triggered a new approach to the problem. The upgrading of precarious settlements in environmentally protected areas is seen with resistance by the environmental licensing agencies. The fact that the environmental qualification parameters of precarious settlements are not consolidated, widely diffused and debated contributes to the impasse. In practice, the environmental licensing agencies are in charge of indicating environmental

gains or improvements. However, it's questionable to consider the environmental licensing as the suitable instrument to address the environmental qualification of slums, based on the logic of compliance to legal requirements and pre-established environmental parameters. In addition, the severity with which environmental laws are applied in slum upgrading is higher compared to the rest of the city, where many times the authorities don't verify the environmental quality gains or even intended protection of the APPs. The upgrading experiences of precarious settlements carried out in the past decade indicate that the impasse remains. An hypothesis yet to be proven is the fact that developments related to the improvement of the legal and institutional frameworks of urban and environmental planning, as well as to the conceptual reflection have not yet triggered, significantly, a new praxis. As mentioned earlier, the "convergence of perspectives", does not eliminate the conflicts. They actually aggravate them when it comes to the operation of policies and programs.

The perspective of political ecology provides elements to interrogate slums and slum upgrading interventions within the economic and political framework, including the complex relationships involved in the process, going beyond the restrictive approach to technical and normative issues. That is, it is necessary to consider that there's a structure of relationships involved in the production of the unequal space and appropriation of the "natural" space in general, and in the space of the slum. Unveiling these issues can contribute to a better conduction of socio-environmental conflicts, encouraging the construction of a conciliating cross-sectoral approach that gives priority to social justice. Without the later it will not be possible to develop a new approach to the urban environment.

Note

i Federal Law n. 11,977/09 established the procedures to regulate land of social interest defining the need to perform a project of land regularization to demonstrate the improvement in the environmental quality resulting from the intervention. This law was repealed by Federal law n. 13,465/17 that maintained the demand regarding this content.

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Original Article

THE ENVIRONMENTAL DIMENSION OF SLUM UPGRADING

***Abstract*:** In metropolitan areas, a significant share of precarious settlements is located in environmentally protected areas. They have high levels of complexity and socio-environmental inequality compared with other areas of the overall territory. For this reason, any intervention in areas with such characteristics has to be managed by integrating social, urban and environmental dimensions. With regards to the evolution of slum upgrading policies and developments in the legal and institutional frameworks that regulate urban and environmental policies, the challenge to articulate these dimensions in order to guarantee both the right to housing and promote environmental recovery still remains. This paper is based on the theoretical panorama that problematizes the social production of space and divided approach to society and nature. It discusses the developments, limits and conflicts that emerge in the practice of slum upgrading. Two issues stand out: the management of the environmental dimension in upgrading projects and works; and the enforcement of the new regulatory frameworks to promote the regularization of these settlements.

***Key words*:** Slum upgrading; environmental requalification; precarious settlements; environmental recovery.

***Resumo*:** Parcela significativa dos assentamentos precários nas regiões metropolitanas localiza-se em áreas ambientalmente protegidas e apresenta alto grau de complexidade e desigualdade socioambiental em relação a outras porções do território. Por isso, qualquer que seja a intervenção em regiões com essas características, o tratamento deve demandar a integração das dimensões social, urbana e ambiental. A despeito da evolução da política de urbanização de favelas e dos avanços relacionados ao arcabouço jurídico e institucional das políticas urbanas e ambiental, permanece ainda o desafio de articular essas dimensões de forma a observar o direito à moradia e promover recuperação ambiental. A presente análise baseia-se em quadro teórico que problematiza a produção social do espaço e a visão cindida entre sociedade e natureza. Discutem-se os avanços, limites e conflitos que se estabelecem na prática da urbanização de favelas. Duas questões ganham destaque: o tratamento da dimensão ambiental nos projetos e obras e a aplicação dos novos marcos regulatórios para promover a regularização fundiária desses assentamentos.

***Palavras-chave*:** urbanização de favelas; requalificação ambiental; assentamentos precários; recuperação ambiental.

***Resumen*:** Una parte significativa de los asentamientos precarios en regiones metropolitanas se ubica en áreas de protección medioambiental y presenta un alto grado de complejidad y

desigualdad socio ambiental respeto a otras partes del territorio. De esta manera, cualquier que sea la intervención en regiones con estas características, demanda un tratamiento integral en sus dimensiones social, urbana y medioambiental. A pesar de la evolución de la política de urbanización de favelas y los avances en el aparato jurídico e institucional de las políticas urbana y medioambiental, el reto sigue siendo el de articular esas dimensiones de forma a observar el derecho a la vivienda y promover la recuperación medioambiental. Este análisis se embaza en un cuadro teórico que problematiza la producción social del espacio y la visión desconectada entre sociedad y naturaleza. Se discuten los avances, límites y conflictos que se establecen en la urbanización de favelas. Se destacan dos cuestiones: el tratamiento de la dimensión medioambiental en los proyectos y obras; y la aplicación de nuevos marcos reguladores para promover la regularización del suelo en estos asentamientos.

***Palabras-clave*:** urbanización de favelas; rehabilitación medioambiental; asentamientos precarios; recuperación ambiental.