Slum upgrading within the "Informal Settlements Urbanization - Growth Acceleration Program (PAC-UAP)". A Case Study of the ABC Region within the Metropolitan Region of São Paulo (Brazil)

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Abstract

Our investigation focuses on urban interventions in slums located in the ABC Region within the Metropolitan Region of São Paulo, financed by the "Informal Settlements Urbanization-Growth Acceleration Program" (PAC-UAP) implemented by the Federal Government since 2007. This Program allocates R$1.3 billion (Reals) for slum upgrading in 49 favelas located in the Region (the exchange rate on 06/08/2015 was RS 3.10 for one dollar). The ABC Region is historically renowned for having implemented pioneering programs in slum upgrading. Despite a considerable increase of federal investments, the upgrading effort has not produced quantitatively significant results. The persistent low rate of execution of contracted upgrading projects and final payments, observed at the national scale, is also evident in the ABC Region. The classification of settlement types and of the respective interventions provides an overall perspective of the program's implementation in the region, allowing thus, the identification of the program's reach and limitations. We conclude that improvement in project design with emphasis on a more systemic, overall and integrated approach to area upgrading is required to guide investments applicable over a long period of time. Furthermore, it is important to continue investing in slum upgrading, albeit some adjustments in the procedures could overcome some of the key challenges. This type of urban intervention is different from a green-land development approach and as such, an "overhaul" approach should be considered instead. Consequently, this may imply in fine-tuning the institutional framework for project implementation, monitoring and disbursement schemes.

Keywords: Favela, informal settlements, slum upgrading

1. Introduction

The implementation of the Informal Settlements Urbanization – Growth Acceleration Program (PAC-UAP) represents a milestone in Brazilian slum upgrading policy. For the first time in history the Brazilian Federal Government allocated significant resources for this type of urban intervention, in stark contrast to the municipally-led approach, dominant in the early part of the decade, characterized by limited federal government financial contributions (DENALDI, 2004).

Over the last decades, the State has been a passive observer in face of the incredibly high rates of slum expansion. Housing and urban policies where often dislocated from the demands of the slum population. Until the 1960s eviction/forced removal was the urban instrument of choice. From the 1970s onward, the State began to play a more significant role, admitting the need to upgrade favelas, through the implementation of "alternative programs" characterized by a limited scale of intervention, often dislocated from the structural housing policy approach, and, consequently, detached from the key institutional structures. PROMAR, released by the National Housing Bank (BNH) [1], was the first federal program of this type.

During the government of Itamar Franco (1992-1994) the "Habitar Brasil" Program was designed to channel budgetary resources to finance the production of housing units and slum upgrading. Within this Program, the needs of approximately 15 thousand families were met in 1993, whereas in 1994 the program attained the mark of 35 thousand families, in conjunction with the "Morar Pequenas Comunidades" Program (SOUZA, 1997).

During the Fernando Henrique Cardoso (FHC) government (1995-2002) a number of programs were created and allocated to meet the needs of the favela population. The "Habitar Brasil" Program was restructured into two sub-programs "Pró-Moradia" and "Pro´Saneamento" within the Social Action and Sewage Treatment Program (PASS). In 1999, during the second mandate of FHC, the federal government signed a loan agreement with the Interamerican Development Bank (BID) to finance the Habitar Brasil/BID Program, with the specific intent to improve housing conditions in slums, following the guidelines established in the preceding "Habitar Brasil" Program. None the less, the inadequate financial resources allocated to the program after

[1] The National Housing Bank (BNH) operated from 1964 to 1986.

the closure of the BNH and the inefficient regulatory framework implemented to guide de aforementioned investments, hampered scaling efforts of slum upgrading in Brazil[2].

From 2003 onwards, during the first government of Luiz Inácio Lula da Silva, the housing sector underwent institutional restructuring, restoring investments in the sector. During the 2003-2010 period investment in the housing sector inverted the sector's stagnation, experienced since the closure of the National Housing Bank in 1986. Within this new dynamism two key programs were implemented: the Informal Settlement Urbanization Program (PAC-UAP) in 2007, and in 2009, the Minha Casa Minha Vida Program (PMCMV) [3].

In addition to countering the historic housing deficit, the MCMV Program was implemented by the federal government as a strategy to deter the effects of the international real-estate/financial crisis, incrementing significantly the supply of both social and market-oriented housing. Approximately one million housing units were contracted within the first phase of the Program. After achieving this goal, the Program's second phase was released in 2011, estimating the contracting of 2.4 million housing units until 2014, out of which 1.6 million were to target the lowest-income families (MAGALHÃES, 2013). This program gained centrality and importance on the national development agenda, to a large extent overshadowing the national housing policy. The PAC-UAP targets slum upgrading and is developed through partnerships among state and municipal governments, which become the key agents of change. The Program funds urbanization projects (infrastructure, sewage treatment, drainage systems and geo-technical containment structures), community facilities, new housing units, housing upgrading, social services, and land tenure regularization. It is important to note that slum upgrading, within the Program can occur on both private and public lands, without distinction. Infrastructure may be built without necessarily holding legal status over the land tenure, however a land regularization plan must be presented. The regularization itself may occur after the completion of the intervention works.

Since 2007, R$33 billion Reals were contracted out for slum upgrading, out of which R$20.2 billion in PAC1 and R$12.9 billion in PAC2, representing a total of 3654 upgrading projects (BRASIL, 2014, p 154). Despite PAC-UAP's significant investments, evidence suggests that the program is losing relevance on the federal agenda. One of the Program's key challenges,

[2] According to the statement released by the federal government in 1999 the executed investment for the 1995-1999 period was R$ 773 million in Pró-Moradia, R$ 2.6 billion in Pró-Saneamento, R$ 695.1 million in Habitar Brasil and R$ 803 million in PASS. (BRASIL, 1999 *apud* DENALDI, 2003, p. 24).

[3] For further reading on the MCMV Program refer to Klink & Denaldi (2014)

which can be noted throughout the national territory, is the low rate of execution of contracted upgrading projects. The assessments carried out through a joint effort between the Ministry of Cities and the Ministry of Planning, Budgets and Management have shown that the expected results, in terms of number of completed projects or number of projects in progress, were not attained. According to the 11th Assessment of PAC2, until October of 2014, approximately R$33 billion Reals - R$20.8 billion under PAC1 and R$12.7 billion under PAC2 - were contracted out to implement 3113 and 413 projects respectively, servicing 575 thousand families (BRASIL, 2014, p.192). Furthermore, the Assessment from 2014 showed that only 12% of upgrading projects contracted in 2007/2008 were actually delivered and none of the projects contracted in 2011 have been completed. In addition, approximately 10% of projects contracted in 2011 did not begin the works.

Considering the increase of federal investments in slum upgrading projects, low rate of contract execution, and limited knowledge of the potentials and challenges in scaling up and improving the quality of urban interventions in the favelas, we believe that further research is required to improve the housing policy. As such the following sections will present some of the recent studies carried out with this purpose.

2. Slums in the ABC Region: problem scope and intervention

The ABC[4] is located in the Metropolitan Region of São Paulo and includes the municipalities of Santo André, Sao Bernardo do Campo, São Caetano do Sul, Diadema, Mauá, Rio Grande da Serra and Ribeirão Pires. According to the 2010 Census, conducted by the Brazilian Institute of Geography and Statistics (IBGE), 2.5 million inhabitants reside in the region, distributed in 865,145 households. Of these households, 115,270 are located in the so called "subnormal sectors" referring to informal settlements.

However, according to other sources of information, the numbers are quite different. The Social Housing Local Plans (PLHIS) developed in the region indicate the existence of 622 slum settlements, home to around 138,000 households.

[4] The ABC Region is located in the Metropolitan Region of São Paulo. According to IBGE (2010) the region had 2.5 million inhabitants, distributed in 856,145 households. Municipal surveys show that 1059 informal settlements exist in the region, accounting for 212 thousand households, that is, 24% of all households in the Region are found in informal settlements.

Many slums in the area were partially urbanized or were built-up during previous periods, however, not always following a well-defined quality standard. In Diadema, 54% of slums are considered by the council as "urbanized", 39% received some form of improvement (partial urbanization) and only 7% did not receive any upgrading (DIADEMA, 2009). According to information available at the municipal level, 32% of settlements in Santo Andre are considered urbanized (SANTO ANDRÉ, 1996) whereas in São Bernardo do Campo that rate is 37% (SAO BERNARDO DO CAMPO, 2009).The majority of informal settlements is located in areas with environmental restrictions. Studies also show that there is a high percentage of households in geological risk areas[5].

It is interesting to note that the ABC was one of the first regions in Brazil to actively engage in slum upgrading. The city of Diadema was one of the first Brazilian cities to establish, in 1983, a comprehensive policy of slum upgrading and although interventions have not always reached an adequate level of quality, the municipality innovated to address the issue of slum upgrading in a manner that was in stark contrast with the dominant approach characterized by isolated interventions or in the figure of an “alternative” program. At the end of the 80s, the municipalities of São Bernardo do Campo and Santo André also started to implement their respective slum upgrading programs.

In São Bernardo do Campo, the first slum upgrading program was structured in 1989 during the first administration of Mayor Mauricio Soares. Slum upgrading in Santo Andre was initiated during the same period, albeit within a larger municipal housing policy. In the case of Diadema, the political and administrative continuity (with three consecutive mandates held by the same party, from 1983 to 1996), gave room to consolidate and enhance the slum upgrading policy. In contrast, both São Bernardo do Campo and Santo Andre’ interventions suffered interruptions and discontinuities due to the alternating political landscape.

Denaldi (2003) points out that the design of policies during this period was focused on guaranteeing the legal recognition of land tenure and ensuring "minimum social rights", such as access to sanitation. Interventions consisted of opening roads and alleys to perform sanitation and paving works. Wherever possible, a minimum land parcel (45X50 square meters) was adopted. The works were performed with only local resources, since state and federal funds,

[5] During surveys carried out in 2009 and 2013 within the informal settlements, six out of seven municipalities in the region had more than 24 thousand households in situation of geological risk, such as landslides, erosion of waterway margins and flooding. Out of this total, 9374 households were in areas of high or extremely high risk.

either did not exist or where insignificant for this type of intervention. Back then the production of new household units and dwelling rehabilitation was not the preferred modus operandi. In the 80s, most municipal actions were characterized by an "emergency" intervention mode, with the intent to improve, to some degree, infrastructure conditions. However, projects were often executed *in loco* and in most cases, the scale of interventions was limited to the territory occupied by the favela (Denaldi, 2003, p. 191).

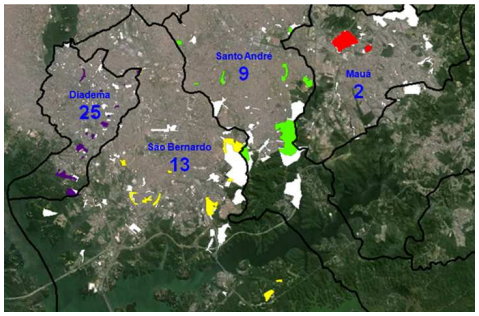
During the following period (1993-2006), interventions were enhanced. As a pre-requisite, the interventions required the preparation of an urbanization project to obtain resources and initiate action in more complex areas, which required removal of some households, and thus, the production of new housing units. This period coincided with the institutionalization of the slum upgrading policy at the federal level.

The improvement of the intervention approach is directly related with the importance given to the project design phase and with the integration of favelas with the “formal” city. This conceptual turn forced municipalities to envision that slum upgrading interventions required more than just building housing units, but rather improving the territorial integration between the community and the city by building within the favela or in its immediate surroundings a number of public facilities such as parks, community centers, sports centers, kindergartens and health clinics. During this period, the region became widely known through its innovative slum upgrading program called "Santo André Mais Igual", launched in 1997. The program’s core concept was based on establishing institutional linkages amongst various sectoral programs (such as education, health, culture etc.), bundling the delivery through an urbanization process, spatially overlapping with slum territories. It is worth mentioning that this program was acclaimed both nationally and internationally[6].

With the implementation of the PAC-UAP Program in 2007 a new phase of slum upgrading was inaugurated. The substantial increase in federal funds for urbanization increased the intervention scale at the local level. Currently, 49 settlements within the ABC Region, accounting for approximately 49.000 families, have received some sort of intervention within the PAC- UAP Program.

[6] Major awards: “Public Management and Citizenry Prize” awarded bythe Getúlio Vargas and Ford Foundations, in 2000; selected as one of the 16 best practices in the world referenced by UN-Habitat during the *Istambul + 5 Conference in* 2001; Dubai International Award for Best Practices during Habitat Conference in 2002. Ver Denaldi (2012).

Figure 1 – Settlements that received information under the PAC-UAP Program in the ABC Region.



Source: IBGE, 2010; Moretti et al, 2014. Note: Blank polygons represent slums, according to IBGE census (2010), whereas the colored spots represent the slums with PAC- UAP intervention in each municipality.

The total investment of the PAC-UAP Program in the ABC Region is 1.3 billion Reals and was made possible through 36 financial contracts disbursed under the program, 25 within PAC1 and 11 within PAC2. This amount does not include the resources allocated for the production of housing units under the Minha Casa Minha Vida (MCMV) Program which funded the essential relocation and resettlement solutions. Of this amount, approximately R$874 million Reals, or 67% of the total, accounted for transfers from the federal government and R$430 million (33%) came from counterparts contributions, from both municipal and state governments[7]. Counterpart percentages differ greatly among municipalities, ranging from 5% in the case of Mauá, to 41% in the case of Sao Bernardo do Campo, which is almost equivalent to the transfer. Federal funds are transferred through transfer agreements and identified by means of a Term of Commitment (TC). The TC may channel resources for more than one settlement. Similarly, a single settlement may receive resources through two or more TCs. As such a TC can allocate resources to specific sector(s) of the settlement, problem(s) or project phase.

3. Characteristics of settlements and investments covered by PAC-UAP

Most of the region's informal settlements covered by PAC-UAP's investments have population densities between 500-1000 people per hectare (inhabitant/ha), however the densities vary significantly ranging from 89 inhabitants/ha to 1127 inhabitants/ha (both extremes of this spectrum are located in Diadema). The size of the settlements is also diversified (number of families considered in urbanization projects): two settlements are home to more than 5,000

[7] Through the PAC-UAP Program the federal government invested in the region approximately R$ 873 million whereas municipalities and the state government invested R$ 360 million and R$ 70 million respectively.

families, nine settlements have between 1001 and 5000 families and twenty-five settlement have less than 500 families.

Forty five percent of settlements in the region are located on rugged terrain and 17% have a significant presence of sharp relief, demanding geotechnical stabilization measures. Additionally, the study took into consideration the environmental liens levied on settlements in the ABC Region, with interventions under the PAC. Out of the 49 settlements, 16 were located in Environmentally Protected and Watershed Restoration Areas (APRM) belonging to the Billings Watershed. Twenty-five settlements (51%) of this group have liens related to the waterways Permanent Preservation Areas (APPs), whereas fourteen settlements (29%) have liens related to natural spring APPs.

Geodynamic risks were not identified on only nine settlements whereas the risk of landslides are most common, identified in 55% of all studied settlements. Risk of flooding (37% of settlements) and erosion of stream margins (39%) was also observed. It is important to note that a large number of settlements considered in the study reported a combination of more than one geodynamic risk.

Most of the settlements benefited by PAC-UAP have received some kind of slum upgrading intervention in the past. According to information collected from municipality sources, out of the 49 settlements that received PAC-UAP resources, 39 of them (80%) received interventions funded by other sources over the past three decades. Information on existing infrastructure before the PAC-UAP intervention confirms this finding. The municipalities reported that 92% of the settlements had partial or total coverage of water supply networks, before the intervention; 85% had sewage treatments[8] and 90% had drainage systems. More than half (53%) of interventions are complementary to other investments carried out in the area; another 43% are aimed at a complete slum upgrading intervention and only 4% are geared towards a specific sector of the settlement.

The interventions were classified into six types as shown in **Table 1**. It is important to note that only 22% of all settlements experienced total substitution of households for new housing units and total removal of the population from the community.

[8] In some cases these networks are being revamped due to overlay with other programs or as part of a general improvement in service provision.

Table 1 – Type of intervention within the PAC-UAP Program in the ABC Region.

Type of Intervention	Number of settlements	%
Urbanization maintaining families in the same area (without resettling)	3	6%
Urbanization with Housing Units (HUs) built within the perimeter of the settlement	13	27%
Urbanization with Housing Units (Hus) built within the perimeter of the settlement with partial resettling of the population to other area	11	22%
Urbanization with resettling of the population to other area	11	22%
Total substitution of housing in the settlement with new HUs	7	14%
Total removal of the population and resettling of the population to other area	4	8%
TOTAL ABC	49	100%

Source: Moretti *et al* (2014)

When assessing the rate of exposure to geodynamic risk before and after the interventions we can observe that in São Bernardo, Mauá and Diadema the risk is reduced by 75% and by almost 80% in Santo André. It is estimated that with the completion of the works the risk will be reduced by 100%.

Table 2 – Housing Units by type of risk in ABC Municipalities, before and after PAC-UAP interventions.

Municipality	SA		SBC		Diadema		Mauá	
Number of Housing Units	Before	After	Before	After	Before	After	Before	After
Flooding	30	-	1.413	186	972	149	-	-
Landslide	1.900	481	983	426	611	192	1.218	304
Land Undermining	1.300	-	334	66	78	21	-	-
Other	1.185	420	121	67	-	24	-	-
Total HUs in risk	4.415	901	2.851	745	1.661	386	1.218	304

Source: Moretti *et al* (2014)

Besides to the funds raised under the modalities of the PAC-UAP, additional funds are allocated by the MCMV Program to cover the costs of removal solutions (relocation or resettlement). According to the information provided by municipalities, by December 2013, the construction of four housing projects was contracted in the ABC Region through the MCMV Program, linked to urbanization intervention under the PAC-UAP Program, totaling 1,652 HUs and approximately R$ 107 million in investment, according to the information provided by the municipalities.

However, the amount of new housing units contracted under the MCMV Program (by December 2013) was not sufficient to meet the number of families that needed to be removed and resettled as a result of interventions funded by PAC-UAP. Municipalities were negotiating new financing proposals under the MCMV to complete the urbanization process. According to municipal information, ten new housing projects are in the pipeline, enabling the construction of about 2500 new housing units.

Table 3: Estimated contracted resources for urbanization of settlements within the PAC-UAP Program[9]

MUNICIPALITY	PAC-UAP	PAC-UAP + contracted MCMV	PAC-UAP + estimated new contracts with MCMV*
Santo Andre	R$384,934,543.31	R$460,404,756.49	R$460,404,756.49
Sao Bernardo do Campo	R$684,740,634.21	R$716,659,226.37	R$763,123,226.37
Diadema	R$161,653,694.61	R$161,653,694.61	R$267,733,694.61
Maua	R$72,531,819.27	R$72,531,819.27	R$150,483,819.27
TOTAL	R$1,303,860,691.40	R$1,411,249,496.74	R$1,641,745,496.74

Source: Ministry of Cities and interviews with technicians from Municipal Governments

* The estimate investment of the MCMV Program was calculated based on the number of HUs necessary to complete urbanization, informed by the municipalities, multiplied by the value of the price ceiling (per HU) of the program in the São Paulo Metropolitan Region (R$ 96mil)

The total cost of investment per family within PAC-UAP's contracts does not represent the total (executed or forecast) cost of investment required to complete the urbanization interventions,

[9] Dollar exchange rate in 06/08/2015: RS 3.10

including building new housing for resettled families. As mentioned earlier, the resources are insufficient to complete all the urbanization works. In addition, most of these areas were partially urbanized or received some kind of improvement in the past. These improvements were implemented with state and/or municipal resources or through federal programs such as "Habitar Brazil/IDB."

The average investment in the region per family under PAC-UAP contracts is R$27.000, ranging from R$9000/family in Maua to R$44000/family in São Bernardo do Campo[10]. When the analysis is done by settlement rather than by municipality, the observed variation is ever greater - from R$4,000 to R$90,000[11]. However some caution is required when interpreting this data.

In some cases, this value is underestimated due to the fact that the total PAC-UAP investment is often calculated for interventions in only a part of the area, whereas the number of households is based on the total number of families in the settlement. This is the case with the Nova Conquista settlement in Diadema, which has the lowest investment amount per household (R$4000): the settlements has 2300 families, but the intervention area financed by PAC-UAP contracts corresponding only to a sector known as "Setor Krones". The remainder of the settlement was urbanized earlier with funds from other sources. A similar case can be seen in the Sacadura Cabral community in Santo André, which shows an investment of approximately R$4600/family. The actual intervention under PAC-UAP resources corresponds to a fairly small area, considering that the slum has been urbanized in the 2000s with municipal, federal and European Union resources. In the case of the highest investment cost per housing unit (R$90,000) the presence of a pipeline requires the removal of a large portion of the population raising the costs of intervention.

These per family investment values rise when the equation includes contracted and planned resources under the MCMV Program. Considering the feasibility of funding construction of necessary housing units, the average investment per family in the region rises to R$ 33,658, varying by municipality from R$18,265/family in Mauá, to R$ 48,865/family in São Bernardo do Campo.

[10] The value refers to the total investment under the PAC-UAP Terms of Commitment for the ABC Region, divided by the total number of residents living in settlements services by the program. Sources provided by the Municipalities and by the Housing and Urban Development Company (CDHU).

[11] Approximate values.

Table 4: Average investment per family by financing source (contracted and forecast).[12]

MUNICIPALITY	PAC-UAP TOTAL [1]	PAC-UAP + MCMV contracted	PAC-UAP + MCMV (forecast)
Santo Andre	R$ 25,833	R$ 30,898	R$30,898
Sao Bernardo do Campo	R$ 43,846	R$ 45,890	R$48,865
Diadema	R$ 16,133	R$ 16,133	R$26,720
Maua	R$ 8,805	R$ 8,805	R$18,265
Region	R$26,732	R$28,933	R$33,658

4. Final Remarks

In this article we presented the general characteristics of slum upgrading interventions in the ABC Region (both in progress and forecasted values) financed with PAC-UAP contracts. A number of conclusions can be drawn from the analysis. The first one is that, overall, the scale of intervention has expanded significantly- 42.6% of households in informal settlements (if data is based on the subnormal housing sector reference provided by IBGE - 2010), or 35.5% (if municipal information from the PHIS is used), are located in settlements that receive some type of intervention under the PAC-UAP Program[13]. Despite the fact that urbanization of most of these settlements has been initiated in previous years and that the allocated investments often are still insufficient to conclude the urbanization and integration of the settlement with the "formal" city, the current program is unquestionably a far-reaching intervention in terms of number of settlement beneficiaries. It is noteworthy that slum upgrading interventions in the ABC Region began in the 80s, resulting in more than 30 years of slum upgrading practices[14] (regardless of the alternating political scenario) before PAC was released in 2007, however, all these initiatives were able to reach only approximately 37000 households, that is 17.5% of total households. Therefore, interventions under PAC will have a significant impact on the region.

[12] Dollar exchange rate on 06/08/2015: RS 3.10

[13] According to IBGE (2010) the ABC Region has approximately 115 thousand households in slums (subnormal sectors). According to municipal records registered in the PLHIS, this number is 211 thousand households, out of which 138 thousand are in irregular and precarious" settlements, whereas 73 thousand are in "irregular" ones.

[14] The source of this information is derived from the PLHIS, created by the Municipalities of São Bernardo do Campo (2010), Santo André (2006; 2011), Mauá (2011) and Diadema (2009). The data may be underestimated.

Secondly, even before the completion of the works, the interventions have already achieved significant results in reducing environmental risks and increasing the environmental quality within the settlements, especially those related to drainage and recovery of the waterway margins.

However, as mentioned earlier, only 12% of urbanization works selected in 2007/2008 were completed. Even more worrisome is the situation when we consider that the works selected in 2011 were still in the implementation phase. What are the causes for this poor performance?

To answer this question appropriately we must take into consideration a wider perspective of the data presented above. Essentially, the physical characteristics of the settlements in the ABC Region correspond to a level of complexity observed throughout the metropolitan region. Most settlements are located in areas with environmental liens, with rugged territories and advanced geodynamic risk. The fact is that the settlements are often consolidated, with high density and with sectors that have been urbanized inadequately in the past. This feature indicates the complexity of the physical intervention and social work. As such, the intervention process needs to start with integrated assessments, obtainment of environmental authorization or licensing and count with the execution of complex sanitation, drainage and geotechnical works. This often involves intervening in the surrounding area at the watershed scale. In addition, it almost always requires the removal of a significant percentage of the residing population.

Not surprisingly, an urban intervention within these conditions is more complex than the intervention that takes place in an empty area (green land development). Even if the municipality were to have a complete and detailed project - which has not been observed in the field – its implementation in the short term would be hampered, given that physical and social complexity involved.

The project design is not always based on integrated assessments. The design is unfinished and often lacks the necessary details[15]. This increases the level of unpredictability existing in such projects causing numerous changes and revisions (both quantitative and budgetary) during the execution of the work, often leading to a temporary standstill. Several authors[16] point out that since the 90s the slum upgrading projects have decreased in quality. Back then intervention

[15] This argument is based on the second phase of the research "Urbanization of Informal Settlements in the ABC Region within the PAC Program".

[16] See: Bueno (2000); Denaldi (2003); Moretti et al (2009).

guidelines were formulated which considered the need for integrating the settlement with the "formal" city. In addition, specific standards were set to guide the execution of works. Needless to say, the field of project design and slum upgrading can be still considered incipient from a technical and/or knowledge perspective.

Another aspect to consider is that these areas are constantly in transformation, that is, are permanently transformed by the action of its residents or by the physical environment. When we consider that it is not uncommon for a project to start its intervention only two or three years after its approval, the dynamism in the area is a factor that needs to be considered. Often, the time gap between project approval and implementation is a result of the environmental licensing process required by the Caixa Econômica Federal (CEF) to release the funds. These licensing, evaluation, contracting and bidding procedures are time consuming. Often settlement occupation conditions and characteristics of the site change during this period. Even with a good quality project revisions and additions are required. Unfortunately, the project logic, financing scheme and control of the works still follows a model that is more in tune with green site development than with slum upgrading. As such, a timely debate should be stimulated on new practices emerging in designing, budgeting and financing the urbanization works in informal settlements, considering the settlements' specificity and complexity.

In addition to the "intervention complexity – project quality – territorial transformation," challenge-tripod, the rigidity of hiring and measurement of slum upgrading works is also pointed out by technicians and municipal managers[17] as a major obstacle. The rigidity of the hiring process is not compatible with the character of the project, territory and complexity of slum interventions.

Another issue that needs to be further explored relates to the nature of the intervention, development costs and PAC-UAP design. Our analysis of the interdependent relationship between new housing proposals under MCMV and PAC-UAP frameworks points us in that direction. Municipalities have reported submitting proposals for additional resources under the MCMV Program to complete the urbanization of 22% settlements assessed in this study, referring to the need for at least another 2500 housing units, accounting for approximately R$ 230 million. In some cases, (ex: Jardim Oratório in Mauá) resources are required to both build

[17] Information obtained from workshop carried out on the 1st of September of 2013, at UFABC – Santo Andre Campus – during presentation and debate of preliminary findinds on the PAC-UAP projects in the ABC Region. Representatives of municipal government, Caixa Economica Fedeal (financial institution) and the Housing and Urban Development Company participated in workshop.

new housing units and to solve the more complex geodynamic risk and infrastructure interventions, within the settlements' centers and on hilltops.

We conclude that a large portion of these settlements was urbanized in the past with serious consequences, and that the current allocated and contracted amounts, although significant in size, will not be enough to complete the urban intervention process. This may aggravate the slow pace of contract implementation. To perform a number of infrastructure services (such as opening roads, building sewers, recovering streams, and securing geotechnical risk area) housing units need to be provided to enable the removal of the population (when necessary). Therefore, the lack of integrated design and funding of all project components will compromise the execution of the contracted works.

Finally, the logic of the project and volume of financing requested to the Ministry of Cities as well as the financing limits set for each program component can hinder or prevent the completion of the urbanization intervention. The study observed that municipalities often try to fit the costs of intervention within a "specific fund", but that amount is insufficient to complete the project. An example of this dynamic was noted in Jardim Oratório[18]. In cases where funds are not available (especially for housing production) the municipality performs only the interventions that are possible without partially or totally resettling the population. This "on-the-spot account" compromises the quality of the intervention. This practice is an effect of incomplete projects and poor design, or in other words, is directly related to the limited administrative capacity of the municipality, with regards to funding rules and limits set by the program.

Urbanization costs per household and investment limits per program item may also hinder the implementation of appropriate solutions and further slow-down the execution of urbanization works, especially in cases of interventions performed in the first phase of the program. Physical characteristics and occupation of settlements are very different, and in many cases the intervention is complex and can cost more than the transfer limit per unit established by the program. Often the municipality sets up an "on-the-spot account" and does not contract the execution of all necessary services and works. The operational guidance No. 01/2011 of the Ministry of Cities, established on the 22nd of February, 2011, excludes pricing caps for items that have high variation such as geotechnical risk interventions, which means that investment

[18] The Jardin Oratório favela is located in the Municipality of Mauá, has an area of 1,129,350m2 and holds approximately 7.5 thousand families.

limits are not established for such items, in addition to enable the request for additional resources to build new housing units under the MCMV Program. However, evidence suggests that the limits set by the program are not enough to perform the intervention as a whole. To "meet the costs", the municipality increases its counterpart or excludes services under its responsibility. Often the project is compromised because the city cannot meet the counterpart or because the exclusion of services undermines the delivery of other project components.

This discussion refers to another that relates cost per family of urbanization in metropolitan areas. This study showed that there is a wide range of investment cost per family and per project. Of course the nature of the intervention, urbanization stage, quality and design partly justify this variation. However, preliminary results indicate that the complex development costs of slums located in metropolitan regions are above the limits set by the program. It is noteworthy that, in the 80s and 90s, the urbanization of slums was the cheaper option in comparison with the production of new housing. This assumption should be reassessed in light of recent changes related to the consolidation and intensification of settlements, increased removal percentage to facilitate urbanization and environmental recovery of the settlement, intervention strategies that require the incorporation of various components in addition to the complex execution of works that go beyond the boundaries of the favela.

We conclude that, to understand the low rates of implementation of slum upgrading works in the ABC Region and in Brazil in general, one must assess the nature of these interventions, institutional constraints of local governments and of the financing institution (Caixa Economica Federal - CEF), as well as identify the obstacles posed by the contracting and project management model and regulations, set forth by the federal government (Ministry of Cities and CEF).

The information produced in this study is insufficient to weave conclusions about the low level of implementation of works, but does pinpoint some factors that may explain the program’s limited performance. Further studies are required to test the hypotheses set in this study.

Nevertheless, the low rate of execution should not justify the extinction or reduction of the program’s importance, a trend that unfortunately has been noted compare to the MCMV Program (mainly concerned with green-site development) in detriment to the allocation of (fewer) resources for slum upgrading. The improvement of these issues is pivotal within the

context of Brazilian metropolitan regions, especially when we consider the unprecedented positive results recently achieved by the federal program.

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