
A TIME LIMIT FOR URBAN LAND REGULARIZATION IN PERMANENT PRESERVATION AREAS: THE LEGAL ECONOMIC AND BEHAVIORAL ANALYSIS AND ENVIROMENTAL PROTECTION

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ABSTRACT

This article sets the timeframe that limits the possibility of urban land regularization in areas of permanent preservation, forecasted by the New Forest Code, covering normative, economic and behavioral analyses of the relevant legal standards. First, the principles that influence the interpretation of environmental standards and the legislative development frame on the subject are outlined. After that, enlarging the approach with a focus on concrete effects expected from the application of the legislation, the economic analysis is used, working on the idea of incentives and the concepts of cheap talk and moral hazard. Finally, the behavioral analysis based on radical behaviorism provides the theoretical basis to link the different normative interpretations and how they influence the behavior of those who are affected, seeking for appropriate environmental protection. Thus, the combination of such theoretical references allows for understanding the legal milestone that best conciliates environmental protection, mitigating the risk of further degradation arising from the illegal occupation process, providing greater legal assurance to those who now occupy non-buildable areas.

Keywords: Urban land regularization; Permanent preservation areas; Legal milestone; Cheap talk; Radical behaviorism.

*UM LIMITE TEMPORAL PARA REGULARIZAÇÃO FUNDIÁRIA
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PROTEÇÃO AO MEIO AMBIENTE*

RESUMO

O artigo fixa o marco temporal adequado que deve limitar a possibilidade de regularização fundiária urbana em áreas de preservação permanente, prevista no Novo Código Florestal, percorrendo, para tanto, análises normativa, econômica e comportamental das normas jurídicas pertinentes. Assim, primeiramente, delineiam-se os princípios que influenciam a interpretação das normas ambientais e o quadro de evolução legislativa acerca do tema, buscando aplicar a tradicional abordagem sobre o tema. Após, ampliando-se a abordagem, com foco nos efeitos concretos esperados da aplicação da norma ou de determinada interpretação, utiliza-se a análise econômica, trabalhando-se a ideia de incentivos e dos conceitos de cheap talk e risco moral. Por fim, a análise comportamental, lastreada no behaviorismo, dá o substrato teórico para relacionar as diferentes interpretações normativas e como estas influenciam o comportamento das pessoas atingidas, buscando-se a adequada proteção ao meio ambiente. Desse modo, a combinação de tais referenciais teóricos possibilita vislumbrar qual o marco temporal que melhor concilia a proteção ao meio ambiente, mitigando risco de novas degradações oriundas do processo de ocupação irregular, com a concessão de maior segurança jurídica às pessoas que hoje ocupam áreas não edificáveis.

Palavras-chave: *Regularização fundiária urbana; Áreas de preservação permanente; Marco temporal legal; Cheap talk; Behaviorismo radical.*

INTRODUCTION

After the issue of the New Forest Code (Law n. 12.651/2012) and intense discussions in the Brazilian parliament, national legislators foresaw new public policies for the preservation of the environment and its compatibility with already developed anthropic activities, softening obligation to recover permanent preservation areas (APP) in rural and urban properties.

Articles 64 and 65 of Law n. 12.651/2012 introduced two instruments aimed at urban settlements: the regularization of social and specific interests, each one of them with its own characteristics. The legislator seeks, therefore, to provide a greater guarantee for thousands of people who occupy, reside and build their lives in, according to the law, non-buidable areas, but that, due to state omission and the dissemination of such practice among the population, contain a significant part of urban centers.

However, an important issue that has not been explicitly envisaged by the legislator is the time milestone for the application of these standards, which may increase or reduce the total number of eligible areas. A merely dogmatic analysis could point to the appropriate time milestone. However, the consequences of that construction would be totally unknown and that could completely suppress the purpose of the standard to make the regularization of urban areas compatible with maximum environment protection.

The article tries to analyze the effects of defining the legal milestone in order to limit the rule that permits urban land regularization, demonstrating what the most appropriate decision would be for the guiding principles of Environmental Law from the point of view of economic and behavioral analyses of the Law.

The methodology used is the theoretical review of legal concepts traditionally applied in the interpretation of standards. The conclusions are going to be reviewed from the perspective of economic and behavioral analyses, looking for grounding in the new branch theoretical concepts as well as empirical and experimental data from studies based on economic or behavioral approaches to help clarify the problem faced by this article outside a merely dogmatic legal approach.

On that purpose, a normative analysis is going to be carried out in section 1 of this article to point out the principles that rule environmental

Law and the legislative progress of the theme. In section 2, the legal possibilities of interpretation are going to be debated from the perspective of the economic analysis of the Law (deepening the concept of cheap talk) and in section 3, a behavioral analysis using a radical behaviorist approach is going to be carried out.

The conclusion is, in view of the normative framework and the principles assessed as well as the convergences pointed out by the economic and behavioral analyses, that the most appropriate time milestone (in which urban areas should already be consolidated) to allow for urban land regularization regarding permanent preservation areas would be the date when Law n. 12.651/2012 entered into force, that is, 05/28/2012, since effective inspection and punishment of new irregular constructions is implemented.

1 A NORMATIVE ANALYSIS

Before getting into an economic or behavioral analysis of standards, it is necessary to outline the current normative situation in order to understand and find a better solution for the issue.

1.1 Environmental Law Principles

Public policies that focus on the environment have some peculiarities in comparison to the others. Environmental preservation involves, first of all, diffuse rights, that is, rights that belong to the entire society and not to individuals or groups of individuals.

Moreover, a balanced and healthy environment is an essential condition for the survival and development of the human being. Therefore, it is a highly important matter because, without minimum environmental conditions for a decent life, all other individual and collective rights are going to collapse, Law itself and the idea of humanity are becoming useless.

In view of this fundamental issue, from the promulgation of the 1988 Constitution of the Federal Republic of Brazil (CRFB/88), a new normative order was launched and it significantly enlarged environmental protection to reflect the desire of the Brazilian and international societies.

Article 225 of CRFB/88 expressly stated that everyone has the right to a balanced environment, which is a common asset of the people

and essential to the quality of life of present and future generations, imposing the duty to protect it on the State and the collectivity. The new constitutional order laid the cornerstone of a new protective normative milestone framework for the environment, providing the state with the duty to defend it and granting it powers and efficient tools to do so.

A first logical consequence of the constitutionalization of the right to a balanced and healthy environment was to raise it to the condition of fundamental human right, turning it into a principle from which all other principles and rules that govern the patrimonial Environmental Law stem (ANTUNES, 2012, p. 20-23).

Likewise, some kind of intergenerational solidarity (true principle) was created. It is up to the present generations to preserve a balanced and healthy environment not only to insure the current quality of life, but also to allow for the healthy development of the generations that are still going to live in the country (MILARÉ, 2014, 261-262).

Present generations must act ethically and responsibly for the preservation of the environment and for sustainable development, being aware that future generations, although they do not have the capacity to influence present decisions, are those that will be affected in a larger scale by mistakes and successes (MACHADO, 2004, page 51).

However, this does not mean preventing the economic development of humanity. The most modern concept results in a principle of sustainable development in which economic development must be made compatible with environmental protection, allowing for the progress of humanity without jeopardizing its survival through depletion of natural resources (ANTUNES, 2012, p. 25).

In face of the need for sustainable economic development, two other principles are of great importance for the interpretation of environmental standards. The preventive and precautionary principles are essential for the perspective under which Environmental Law sees the facts to be understood, always aiming at maximum environmental protection together with sustainable development.

Before the priority of the position of sustainable development, which was reinforced by the 1992 Rio Declaration to the detriment of the purely preservationist current, it is the Environmental Law's responsibility to interact with economic agents, enabling development in conjunction with the least possible environmental impact.

In order to do so, one must try to foresee the risks of the economic

activity so they can be voided or, if not possible, at least mitigated. In this context, the preventive principle states that, before carrying out potentially polluting activities, all possible measures must be taken to delimit existing risks, as well as possible mitigating measures (MILARÉ, 2014, p. 265-266, FIORILLO, 2006, p. 39-41).

When the impacts of environmental damage are not irreversible, they take many years to be repaired, which is why all agents must be *cautius* in their actions, taking care of the quality of the environment. Modern Environmental Law does not accept coexistence with impulses and excesses. All activities must be carefully calculated, rationalizing economic activity in favor of environmental preservation.

In anticipating the risks of an activity through effective studies, the community and, above all, the State must adopt the most environmentally friendly measures, providing the necessary attention in the interpretation of standards and the implementation of public policies. This principle is not limited to the environmental permitting analysis.

It is easy to see that human activities, the simplest they may be, have an impact on the environment. It is the human being's nature to interact and change the environment in which he lives. It is a natural process that is impossible to avoid.

However, by rationalizing risks, one may conclude that a given activity, because of its high degree of damage, is going to be more harmful than beneficial to the collectivity. On the other hand, by forecasting mitigating measures, a project that is highly impacting may have good cost-benefit for the community.

The fact is that today's society is fully aware of the importance of a healthy and balanced environment for mankind's survival and, based on this anthropocentric view, it does not admit that major impacts on the environment are recklessly imposed to enrich capital holders.

The preventive principle requires foresighting risks of both an activity and issuing an environmental standard or even its interpretation, allowing for the sustainable development of society, reconciling the right to development and to a balanced environment.

The precautionary principle must be called upon for those situations when it is not possible to foresee risks inherent to the activity (MACHADO, 2004, p. 55-60). In face of the lack of knowledge regarding the effects of the potentially polluting activity, the right to defend and preserve the environment should prevail, since environmental damages are

difficult to repair and society cannot run the risk of environmental damages being done to the detriment of present and future generations.

Before that open question, the reasonable option is not to adopt potentially impacting measures or, at least, have a conservative attitude when interpreting legal standards and implementing public policies. That attitude should be maintained until the agent gathers enough evidence to outline the main risks of the activity to avoid unknown damages.

In contemporary society, the precautionary principle becomes even more important. Quick technological development creates several innovations and, as a consequence, new risks, some of which are still unpredictable. Already in 1992, the countries taking part in the UN Conference issued such an understanding, pursuant to Principle 15 of the Rio Declaration on Environment and Development.

It is important to notice that both the preventive and the precautionary principle were inserted in the National Environmental Policy, according to art. 4, VI of Law n. 6938/81, as a direct reflex of the constitutional standard in art. 225, caption, CRFB/ 88.

Thus, it is possible to talk about a real balance principle through which public policy makers must look for the solution that provides the society with the greater value when deciding to adopt a certain measure, without resulting in excessive encumbrances to the environment as a consequence (ANTUNES, 2005, p. 49).

Based on the principles outlined above, it is evident that the interpreter, when analyzing a legal standard that is going to outline a certain public policy, should act with balance, prudence and ethics not to compromise the quality of the environment.

When going deeper into this article, one should try to anticipate the concrete implications of the different interpretations, adopting the one that favors the recognition of social, housing and legal safety rights, as long as it allows for sustainable development and maximum possible environmental protection, considering the importance of protecting permanent preservation areas in the cities. That prevents not only damages to the environment, but also risks to health and the physical integrity of those in those areas (Nalini, 2012, p. 200-201).

1.2 Legal Possibilities for Setting the Time Milestone

When introducing arts. 64 and 65 into the Forest Code, Law n. 12.651/2012 allowed for the regularization of irregular occupations in urban areas. However, it failed to establish a time limit to mark off the buildings that would be eligible for regularization.

This omission can lead to different interpretations and it is necessary to recover the standards that ruled the subject before the legislative innovation referred to was issued. CONAMA Resolution n. 369/2006, despite its infralegal characteristics, offered in art. 2, II, c the alternative for sustainable land regularization of urban spaces located in permanent preservation areas, provided there was social interest.

Article 9 of the resolution mentioned above only allowed for the regularization of predominantly low-income areas or the ones located in the Special Zones of Social Interest already defined in the master plan or the municipal legislation, since they were provided with a minimum urban infrastructure and they were located in some of the existing APP types. However, that resolution only permitted the regularization of constructions consolidated by July 10, 2001 (article 9, item V).

Later, Law n. 11.977/2009 (My House My Life Law) provided legal provision that allowed for the regularization of urban APPs. Article 54, paragraph 1 of the law referred to permitted urban land regularization in areas of social interest (predominantly low income) since the areas were consolidated by December 31, 2007.

Finally, as already pointed out, Law n. 12.651/2012 offered the possibility for areas of social interest to be legalized, as well as specific interest ones (not considered as low income), expanding the types of areas that could be regularized. There were also no restrictions regarding the kind of APP that was being occupied. However, the current legislation failed to expressly establish a time milestone to limit its application, only referring to Law n. 11.977/2009 on the form of the land regularization project to be prepared (articles 64 and 65).

In view of such a normative framework, it is possible to notice that the first milestone defined by CONAMA Resolution n. 369/2006 (July 10, 2001) was revoked by Law n. 11.977/2009, which allowed for the regularization of areas consolidated by December 31, 2007. However, a supervening law (Law no. 12.651/2012) addressed the matter and such a normative milestone no longer expressly prevails. This is because,

as already pointed out, the new law was silent and must be correctly interpreted.

One of the interpretation possibilities is that, in view of the omission and remittance to Law n. 11.977/2009 to address issues related to the regularization project, the new law would have maintained the time milestone previously imposed (December 31, 2007) due to its subsidiary application. However, the interpretation of the standard wording leads to believe that the reference to the previous law only regarded requirements and form of the regularization project. The New Forest Code would have exhausted the material issue of regularization requirements and it was deliberately silent when not foreseeing that time milestone anymore.

Such an understanding can be corroborated by the fact that the legislator, when dealing with the regularization of rural areas, has expressly set a time limit for the consolidation of interventions to APPs pursuant to art. 3, IV, Law n. 12.651/2012. Moreover, in view of the maintenance of almost all the existing requirements at the time of Law n. 11.977/2009 (which only dealt with the areas of social interest), there would be no reason for the legislative issue of the same standard if there was no intention to extend it to a greater number of beneficiaries.

Thus, two additional time milestones could be considered: the date when the standard entered into force (05/28/2012) and an indefinite future date, due to the lack express normative forecast. When preparing a regularization project, the municipal authority shall list the consolidated areas on the date when the necessary studies were carried out.

Among the possible interpretations, the principle analysis above indicates that the one that best protects the environment while ensuring quality of life improvement for as many citizens as possible (especially in areas of social interest) is the one to be adopted. However, a purely normative analysis can hide some pitfalls and this is why, before understanding what the best normative interpretation is, an economic and a behavioral analysis of the standard is going to be made.

2 ECONOMIC ANALYSIS OF THE STANDARD

One of the costs of the urban land regularization public policy in permanent preservation areas, which is not that easy to identify as a financial cost, is to endorse a previous illegal behavior. That can erode the state's reputation as an inspection agent in charge of constraining behaviors

against the law.

From the perspective of art. 225, paragraph 3 of CRFB/88 and arts. 38, 39, 48 and 70 of Law n. 9605/98, the suppression of vegetation in permanent preservation areas is a civil, administrative and criminal offense. Therefore, the State has the obligation to supervise, avoid and punish such conduct by demanding the recovery of degraded areas (also dismantling buildings), imposing administrative fines, arresting constructions, banning commercial activities carried out in such areas, criminally prosecuting and applying the appropriate criminal penalties.

However, in view of state omission for decades, none of these measures were adopted to restrain irregular occupation of APPs. Together with the lack of a solid housing policy, it resulted in a massive occupation of non-buildable areas. In face of the existing situation, which is totally against the law, it is currently impossible to adopt the punishment measures previously suitable (because of demographic explosion in the environmentally protected areas). The State understood that the only applicable public policy would be the regularization of those areas.

Nevertheless, by failing to punish illegal conducts and, on the contrary, offering benefits to persons who have committed legal offenses, the state may signal to citizens that an incentive is going to be given to invasion and construction in other areas that bear a construction ban such as APPs. It is clear that such an incentive is not desired by the state, once it results in a cyclical movement in which regularization leads to a new wave of invasions and, consequently, to a new and necessary stage of land regularization, with all the costs inherent to it.

People have a behavioral bias to overvalue short-term benefits and postpone long-term benefits. Thus, they only think about a place for the new home (in face of the social difficulty of obtaining a regular property) and forget that in the long term, the systematic occupation of permanent preservation areas is going to result in the deterioration of the environment, compromising sustainable development and the very quality of life of present and future generations. This phenomenon is called the hyperbolic discount rate (WINKLER, 2005; KARP, 2004; REVESZ; LIVERMORE, 2008).

On several occasions has the legislator imposed a time milestone prior to the validity of the standard to limit the possibility of regularization. This is because the adoption of a future milestone would create an incentive for people to occupy new areas once they anticipated that regularization

would later be possible.

An economic analysis sees Men as rational beings (Theory of Rational Choice) that perform a cost-benefit analysis over their choices (COOTER; ULEN, 2010, 35-45). Thus, the possibility of occupying an area that is currently non-buildable, but that has a legal possibility for future regularization, would clearly unbalance the weigher in favor of the benefits of legal transgression, especially because people characteristically have hyperbolic discount rates and exaggeratedly value short-term benefits, disregarding the real value of high costs only felt in the long term (TABAK, 2015, p.330).

Therefore, the adoption of a future time milestone, which would be extremely damaging to the environment, should be ruled out once it would result in a race for building in permanent preservation areas whenever legalization is a possibility. The normative milestone must be at least simultaneous to the law, making it clear that any construction taking place after the law will be duly demolished and the responsible person, punished.

2.1 The *Cheap Talk* Concept and the Importance of Restraining New Occupations

The adoption of an effective time milestone is not enough to prevent people from taking new non-buildable areas once there is going to be hope that one day their situation is regularized by the state. Endorsing a past illegal act may have people think that similar behaviors are going to be relieved by the state in the near future. Thus, they can ignore the legal provision (stating that new occupations are no longer going to be tolerated) and bet on a possible future regularization of new areas based on a new time milestone.

Such an interpretation is based on real facts. As seen in the previous section, at least two time milestones have already been ignored by the legislator, who consecutively predicted new land regularizations ruled by more encompassing time limits.

Failing to effectively punish an offense and promising severe punishment for future similar acts is considered cheap talk. Cheap talk is a kind of conversation with non-binding promises and little development possibilities in what regards the relevant subjects. That is, it comes very close to empty promises, to the manifestation of intentions with no

condition of checking whether they are actually going to be carried out (SALLY, 2005, p. 250-252). By experimenting models that measure the influence of cheap talk, Sally (2005) concludes that making vague, non-binding promises has little influence on people's decision-making.

In order to test the efficiency of quick and non-binding verbal agreements in rational decision making, Bracht and Feltovich (2009, p. 1036-1038) created an experiment that was applied to groups of volunteers as a kind of game¹ known as *trust game*.

Such a game is an example of a social dilemma in which an individual's decision-making ends up by affecting the interests of the group. In order to test what may actually affect decision making in such games, the authors created a scheme in which groups of volunteers first use a basic version of the trust game. Then, they introduced a model in which the investor could observe the previous behaviors of the allocator; a model in which the allocator could have quick, non-binding conversations to try to gain investor confidence; and a model combining observation and verbal agreements. For all modalities, the expected move was the non-investment of resources.

The conclusion was that things such as cheap talk have not considerably influenced participant's behavior, but the possibility of observing the other player's attitudes significantly influenced the behaviors adopted (BRACHT; FELTOVICH, 2009, p. 1042-1043).

In another experiment (IRLENBUSCH, 2004, p. 299-303), the concept of cheap talk was tested through small non-binding contracts to check whether people actually complied with them even though they were not binding. On that purpose, the game known as *theoretical benchmark* was used. The conclusion was that, although non-binding, the contracts influenced the behavior of the participants (as many would have felt bound by the word given). It is important to notice that participants' rounds and acts were observed by both. As shown in the previously mentioned study, observing behavior influences decision making more than cheap talk. Thus, the fact that a player has observed the behavior of the other player may have been the predominant factor for compliance with the non-binding contracts entered into, and not the committed word.

¹ The Theory of Games analyzes a decision-making process from the point of view of a game in which one must analyze the players, the strategies of each one of them and the gains or returns of each player for each strategy. Thus, by identifying such elements and assuming that Men are rational beings, it would be possible to outline the behavior that is going to achieve the balance point of the game, and a performance profile can be drawn in the making of future decisions. (COOTER and ULLEN, 2010)

Finally, Galbiati and Vertova (2014, p. 48-50) analyzed how law affects behavior, and concluded, after conducting an experiment in a *public good game* [in which obligations without incentives (punishments or awards), non-binding obligations, incentives with no obligations, very little obligations with incentive and considerable obligations with incentive were tested], that the presence of a single obligation or an incentive without an obligation has much less impact on people's behavior than obligations linked to incentives, although these have little probability of being implemented in the concrete case. Thus, in order to effectively influence behavior, it would be necessary not only to forecast an obligation, but also to provide it with an effective incentive for compliance (which could be a punishment or a reward).

By analyzing all these considerations about cheap talk and observing the influence of standards on social behavior, one concludes that a legal promise of punishment alone is not enough to prevent citizens from occupying new, environmentally protected areas. They have to feel that the state is indeed monitoring them and they have to believe they are going to be punished otherwise they are going to regard the law as an empty promise with no *de facto* effect on their attitudes.

There is a problem regarding agencies in which the State (principal) wants to control the conduct of agents and the so-called moral hazard is present. Aware of the lack of effective monitoring (since effective and permanent monitoring would be extremely costly), the agent (in this case, the citizen) tends to make no efforts and, therefore, the principal has to look for mechanisms to create incentives (effective punishment of illicit behavior, for example) for citizens to strive to fulfill the agreed purpose, which is, in this case, compliance with laws (POSNER, 2000, p. 8-12).

Likewise, in case of the occupation of APPs, the State cannot monitor all irregular constructions and, in order to dissuade such illicit behavior, it has to implement the penalties provided for by law whenever irregular constructions are noticed so that people stop relying on the possibility of further regularizations and give up erecting buildings in non-buildable areas.

Therefore, the letter of the law itself, although it legally binds the acts of the Public Power and private individuals, may in practice sound like cheap talk. The mere existence of a possible punishment is not enough to exclude unlawful behavior. People must believe that the state is able to discover illegalities and apply the necessary penalties, even if

the probability of this happening is low. The significant likelihood of a punishment (resulting from the firm performance of enforcement agencies and the judicial system), by enforcing the legal obligation not to occupy permanent preservation areas, is the only way to actually influence citizens, avoiding the continuity of the urban occupation process regarding APPs.

For all these reasons, the conclusion is that endorsing a previous wrongdoing, as in the case of land regularization, has a high reputational cost for the State. People come to believe that similar illegal acts, despite being punished by the law, are going to be forgiven once more by the State, generating a positive reinforcement of new acts against the law.

The only way to reverse this, given the high reputational cost of wrongdoing endorsement, is to implement a robust inspection behavior and to punish new cases similar to those previously forgiven, making people fear punishment and creating an unfavorable environment for the proliferation of acts against the legal order.

3 A BEHAVIORAL ANALYSIS

Despite the validity of the economic analysis conclusions, the rational choice theory is not always feasible since the human being is influenced in several ways and not always adopts the behavior expected by a purely rational economic analysis.

Thus, it is necessary to check the previous hypothesis by carrying out an analysis based on a scientific philosophy about human behavior that does not assume such absolute rationality in order to provide due theoretical background and confirm the validity of the conclusions in the previous section, using this article as a theoretical paradigm of radical behaviorism.

3.1 Brief Considerations on Radical Behaviorism

Radical behaviorism is a philosophy about the science of human behavior that tries to attribute a scientific character to the analysis of the reasons for people's behavior, avoiding subjective answers that cannot be measured from a scientific logic (SKINNER, 2002, p. 14-23, BAUM, 2005, p. 3-35) and based on the experimental model of the natural sciences and strongly on Darwin's Natural Selection Theory².

² There is, therefore, the notion that the environment imposes a selection process between behaviors,

The explanation of human behavior for radical behaviorism goes through some relevant factors such as the environment to which the individual is subjected, his genetic characteristics, the history of contingencies to which he was submitted and the current contingencies (SKINNER, 2003, 43-58; BAUM, 2005, 61-87). When analyzing a particular person's specific behavior, it is possible to notice that it was coined by a history of reinforcements and punishments suffered throughout the person's life, the current context (with the contingencies at the moment of the behavior) and the individual's motivational state (deprivation or satiation) also being important.

An operating behavior is acquired through a reinforcement system consisting in a learning process that results from a relationship between stimuli and a certain activity, a correlation that affects similar future behaviors, causing the individual to seek or avoid the stimuli that he experienced in the past when adopting a certain conduct (SKINNER 2003, p. 64-101).

In order to better understand the reinforcement system that conditions human behavior, one must analyze the concepts of primary and conditioned reinforcement. The primary reinforcement causes a direct stimulus linked to the phylogenetic characteristics of the individual such as food, water, sex, etc. The conditioned ones are those that are properly assimilated by the individual in a process of conditioning in which the latter begins to connect such a stimulus to obtaining a primary reinforcement. There are also the so-called generalized reinforcers. These are reinforcers that are able to be paired with several other reinforcers, indirectly reaching more than one primary reinforcer, money being the most illustrative example.³

A person's behavior can be analyzed by means of the following structure: if every time a certain individual repeats a behavior, a reinforcing or aversive stimulus is presented, this will cause him to adopt the behavior more or less frequently. After a history of the same reinforcements, the behavior is conditioned because the individual is going to behave in a certain way in order to receive or avoid a discriminative stimulus.

A behavior can be conditioned (operating conditioning) by surviving the behaviors that, in the end, better adapt to the controlling environment, which is intrinsically related to the survival of the species itself.

³ Skinner (2003, p.85) defines generalized reinforcers as follows: "A conditioned reinforcer is generalized when paired with more than one primary reinforcer. The generalized reinforcer is useful because the momentary condition of the individual is not important to him."

reinforcements or by punishment. Reinforcements are divided into positive and negative. In positive reinforcements, a behavior is stimulated by the presentation of reinforcement that increases recurrence likelihood. In the negative reinforcement, a behavior is reinforced by withdrawing an aversive stimulus, also making it also more probable, since the conditioned conduct will be associated with the fact that the individual is no longer exposed to the factor that hurts him.

Punishment, on the contrary, reduces the probability of a particular behavior to take place, since an aversive stimulus is presented or a reinforcing stimulus is removed every time a certain behavior happens, which is why the individual avoids it. On the other hand, the probability of a reactive behavior, called escape, is increased. It is, therefore, negatively reinforced, as explained in the previous paragraph (SKINNER, 2003, p. 206).

Existing controls in society can be analyzed under a radical behaviorist bias since individuals or organizations are able to change important variables that influence human behavior and to change factors relevant to the individual's behavior such as motivation, the environment and existing contingencies. Control exerted by organizations is particularly relevant because, although the behavior belongs, in fact, to each member of the group, the reinforcing consequences generated by the group are superior to the sum of the reinforcing consequences of each individual since the members of the group reinforce themselves and potentialize the stimuli that influence their behavior within this social unit. (SKINNER, 2003, p.341).

Implementing an intricate system of reinforcements and punishments can be extremely helpful in gaining control of certain acts. In reinforcements (positive or negative), if a particular behavior is to become more frequent, the individual may be submitted to a reinforcing stimulus or to the withdrawal of an aversive stimulus whenever he adopts the desired behavior. Punishment is also an effective control method, but with the effect of making certain undesired behavior less frequent. The intercurrent of an aversive stimulus or the withdrawal of a reinforcing stimulus in the face of the adoption of the behavior to be restrained makes it less frequent.

Thus, punishment is a method undeniably capable of controlling human behavior, but it can generate emotional byproducts that can be harmful to the individual such as anxiety, agitation and even physical problems and emotional illnesses. That is the reason why excessive

punishment shall be avoided and awarding punishments shall be preferred in certain cases (SKINNER, 2003, p. 198-211).

3.2 The Law Under a Behaviorist Point of View

In contemporary states, government control is ruled by laws, which have the important role of specifying the behaviors to be controlled, as well as the consequence of adopting such behaviors, usually a punishment (SKINNER, 2003, p. 371). However, the law not only controls the individual, but also stabilizes the system imposed by the controlling agent (in this case, the democratic State) since it begins to objectively draw the limits of government control performance.

In the face of the Skinnerian behaviorist philosophy, Law can be viewed as a system of social contingencies with the purpose of punishing or rewarding certain human behaviors in order to decrease or increase their incidence in society, making behaviors allowing for social interaction more frequent and those that make social coexistence impossible, less likely (AGUIAR, 2013 245-250).

Aguiar (2014, 2015), incorporating the concept of functionally specialized social systems⁴, analyzes Law as one of the most important specialized systems in contemporary society. He says that a social system takes place when the behavior of the individual reinforces or punishes another individual, resulting in a network of intertwined behaviors. The law must act through specialized state agencies, imposing reinforcement or punishment contingencies in order to make behaviors that benefit the development of society more frequent (AGUIAR, 2014, 2015).

Law is governed by rules, which have the role of defining contingencies (which may be reinforcing or punitive) arising from a certain conduct adopted by a citizen in a certain context and suffering the consequences set forth by Law. The legal rules are the way for the government, through specialized control agencies (courts, supervisory bodies and functions essential to justice, for example), to control the behavior of citizens, seeking (at least in theory) for the benefit of the entire society.

On the other hand, an individual is only following the rules if

⁴ AGUIAR (2014, p. 261) goes on: "A functionally specialized social system emerges when the relatively stable patterns of reciprocal behavioral influence between particular organizations and the individuals that make up their target audience specialize in fulfilling an important function for the survival and reproduction of the social group as a whole, in a given space-time context."

they help him or not achieve a certain reinforcement or avoid a certain punishment, and the government is only maintaining the behavior of wording a certain rule if the controllers reinforce such behavior⁵, that is, if they obey it or not. The standard itself shall not have a controlling effect, and it must be really implemented and adjusted to the regulation of the desired behaviors (AGUIAR, 2015, p. 12-14).

Law enforcement depends, therefore, on a complex and intricate network of interlocked behaviors. It is responsible for the materialization of the contingencies abstractly imposed by the Law, implementing them and actually controlling the behaviors that take place in society, reinforcing or punishing the behaviors to which it was directed (AGUIAR, 2015, pp. 7-8).

The control coming from the standard goes through several behaviors in the network that is responsible for applying contingencies, from inspection or receipt of a certain infraction notice by an agency, to the development of a judicial or administrative process, the delivery of the decision by the competent body that imposes a certain punishment and the relevant acts for execution, through police agencies, pledge systems, compliance with orders by public agencies and other enforcement agencies. Thus, it is a complex network, formed by individuals inserted into organizations whose behaviors influence and are influenced by each other, responsible for the application of contingencies provided for by law and designed to govern the behaviors desired by society.

3.3 Expected Behavior in the Face of Time Milestones Set Forth

The law considered in an abstract way is only able to control citizens if they have, throughout their lives, submitted themselves to a history of reinforcements and punishments before the fulfillment or noncompliance of a certain standard. Thus, the simple legal provision of punishment due to undue construction in permanent preservation areas is useless to avoid mass occupation, as the current situation of urban areas can evidence.

On the contrary, the Brazilian reality shows that the occupation

⁵ Aguiar explains (2015, p.12): “The instructor who transmits rules that are no longer demanded by the potential receivers are probably stopping to transmit them and exchanging them for more accepted ones. In turn, the rule-maker is, directly or indirectly, a social control agent, that is, someone whose behavior of wording new rules, or creating new and more effective statements of rules in the sense of both its transmission and its application, is reinforced either by the addressees or by other individuals for whom a change in the repertoire of those rules recipients is reinforcing.”

of permanent preservation areas was reinforced over time. Firstly, it is important to emphasize that, due to state omission in inspecting the areas, the construction of houses in the APPs has an extremely reinforcing effect, since the individual owns a property where poor families live and that has an economic value, even in an informal market of ownership.

There is clearly an escape behavior, especially among the poorest who, without having financial conditions to buy or rent real estate in regular areas, occupy non-buildable areas (usually undervalued or lacking effective owner supervision) to build their homes, a fact that is negatively reinforced by the end of the aversive stimulus of the high price of previously paid rents or even the end of an abandonment situation.

Faced with such a situation, if the legal order fails to impose effective punishments for irregular buildings or to reinforce the conduct of preserving permanent preservation areas, there is a high probability that people build in those areas, damaging the environment. It is necessary that the incentive imposed by the government is superior to the incentive inherent to human occupation.

However, what has happened in recent years is a succession of state events that reinforced illegal occupations. The different legislations that made land regularization possible and extended time milestones for the consolidation of constructions subject to regularization, created a reinforcing effect on those who were illegal occupants.

Therefore, by making legal a previously illegal act, illegal behavior was positively reinforced by the State, conditioning citizen's behavior to believe that other similar illegal acts can also be forgiven by government agencies.

It is important to understand that individuals are conditioned not only by the incentive they are submitted to, but also by living the experiences applied to others. Thus, a boy who witnesses the pain his friend suffered when breaking his arm after falling from a tree, does not have to break his own arm for his tree-climbing behavior to become less likely (SKINNER, 2003).

Likewise, a person learned that someone else has built a property in an APP and, instead of having the construction demolished or of being fined, had his situation regularized. The person is going to regard the construction in these environmentally protected areas as highly reinforcing. That increases the likelihood that such conduct is performed. The standard perceived by the citizen is not the ban to construct in APPs, but rather a

standard that, initially, does not allow the construction, but, in the near future, makes it legitimate. This fact is probably going to increase the frequency of the behavior of building buildings in permanent preservation areas.

Thus, a behavioral theory of Law ratifies the concepts of cheap talk and moral hazard derived from the economic analysis, showing that endorsing an illegal behavior implies a reputational cost to the State, which is no longer credible to the population, who starts disrespecting the law. Therefore, before discussing what time milestone best protects the environment, it is important that the State actually starts to punish the occupation of urban APPs, so that the law really matters in the application of aversive contingencies to citizens who disrespected that rule.

Before such a course correction, any abstract legislative discussion is useless since citizens are always regarding the standard as “a law that did not work”, still infringing it and expecting (ultimately fulfilled) their situation to be regularized. On that purpose, it is necessary to correct the failures found in several nodes⁶ of the interlocked behavior network responsible for imposing legal penalties in the face of such constructions.

In order to comply with the law and impose the penalties provided for therein, it is necessary that the environmental inspection agencies effectively monitor permanent urban preservation areas, assessing infractions and communicating the fact to the Public Prosecutor’s Office, which must require environmental agencies to inspect the areas and also seek, through the extrajudicial and judicial means available, the application of the relevant penalties, including the demolition of undue construction. The judiciary branch needs to act faster and to effectively enforce the penalties provided for by law, in order not to break the link of this network, while still ensuring the faithful execution of its decisions.

There is the reciprocal influence of behaviors at each node, and if there is a failure in the operation of one of the parts of the network, that causes an aversive stimulation to the others, who are no longer adopting the behaviors necessary for the application of legal contingencies, since their behaviors are not going to be reinforced by the other parts of the network. The idea of an interdependent and necessary structure for effective enforcement of the law is paramount in understanding the reasons for the failures to date and what corrections should be made to ensure effective

⁶ Node (AGUIAR, 2015) is the point in the network where two individuals or, as addressed in this article, two organizations (naturally consisting of individuals that behave) meet and mutually interrelate and influence their behaviors.

compliance with environmental legislation, the only way to avoid new and common place damage to the environment.

Based on the assumption (albeit unrealistic, in view of the frequent omission of the Brazilian State in this matter) that appropriate measures to avoid new construction are going to be adopted as of the issuance of the New Forest Code, it is necessary to set forth a time milestone that is at least simultaneous to the validity of the new law.

This is because the possibility of a future regularization legal milestone would imply stimulation to reinforce the behavior towards new irregular buildings, since there would be a clear possibility that the building erected after the law is regularized. That would generate a race for the occupation of APPs, resulting in huge damages to the environment.

Thus, in view of the need to protect the environment and after the necessary corrections are made for the effective inspection of the remaining permanent preservation areas, the adoption of a time milestone concomitant with the validity of the law or before it is the most appropriate measure under the behavioral point of view.

CONCLUSION

Looking at the convergence of the economic and behavioral analysis of standards corresponding to the urban land regularization brought by the New Forest Code, the conclusion is that the adoption of a time milestone subsequent to the issuance of Law n. 12.651/2012 is incompatible with environmental protection and unable to avoid a wave of new irregular occupations looking for future regularization.

However, as stated above, setting a suitable time milestone is only achieving the desired effect if the State, through all responsible agencies, effectively restrains the new illegal occupations, under the penalty that the urban APPs deterioration process continues, given the long endorsement history regarding illegal acts.

Based on these findings and in face of the necessary interpretation of the standards that followed, it is possible to understand that the time milestone best serving the purposes desired by the New Forest Code is the date of its validity, that is, 28/May/2012. Once Law n. 12651/2012 is supervening and having failed to foresee an express time milestone for the consolidation of constructions, contrary to the previous normative practice, the legislator clearly intended to reach the largest possible number

of irregular constructions.

This is certainly a good thing, since it is leading to an improvement in living, environmental (in view of the need for compensatory measures and basic sanitation) and legal assurance conditions for as many citizens as possible, without that resulting in an incentive to new occupations, since, of course, the state system definitely bans new occupations that arose after 28/May/2012.

Finally, it is necessary to consider that the milestone does not apply to isolated property, but to consolidated urban areas, so that regularization can, for example, touch land that is still empty but which is embedded in highly anthropogenic areas. The construction in such areas after May 28, 2012 is allowed, since the regularization project for the entire area, which necessarily must have been consolidated by that date, is concluded.

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