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Implementing the SDG15: business climate index in the context of the forestry sector of Tocantins, Brazil

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Abstract

The forestry sector is one of the key sectors indicated in the SDGS, with a specific SDG Goal 15, and crucial for Brazil. This paper aims to contribute to the discussion of the role government needs to play in shaping the business environment to foster the achievement of the SDGs by investigating how can business climate indexes be used to shape public policy. In order to do that, the Forest Investment Attractiveness Index (FIAI) has been applied to the state of Tocantins, in Brazil, to further comprehend which areas of public policy intervention would be more relevant to support the development of a sustainable forestry sector. The results indicate that the sort of tool can only be used in a preliminary analyzes of the economic, political and institutional environment related to the forestry sector.

Keywords: *forest resource policy, forest investment, investment climate.*

1. Introduction

Forests play a crucial role in the SDGs agenda. The sustainable management of forestry resources is essential to combat climate change, protect biodiversity and safeguard the livelihoods of indigenous and rural populations from developing nations. The drastic loss of forests, estimated at 13 million hectares per year, is one of the most relevant environmental problems faced in the developing world. In this respect, forests have received special attention in the SGD agenda. The goal 15 named as “Sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss” encompasses the crucial related aspect of life on earth (UN, 2015).

For the forestry sector, the goals of the SDG 15 include not only aspects related to the restoration of degraded forests and increase afforestation and reforestation but also related to policy planning as part of an integrated approach that includes sustainable forest management and adequate policy instruments that comprise objectives for conservation, reforestation and finance (UN, 2015).

The role that needs to be played by the private sector is central. The firms have unique assets that are essentially required in the delivering of the SDGs, including agility, rapid diffusion and adoption of innovation, economic efficiency and a wide range of technical skills and resources that are not available to governments or the civil society. The private sector has been an active voice in the development of the SDGs, particularly indicating the necessity of including the economic dimension that is directly

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indicated in the SDG – 9 with the conceptual framework of the inclusive and sustainable industrial development.

The private sector operates in a complex environment that is broadly shaped by the combination of political, institutional, regulatory, economic, social and physical dimensions that can be collectively named as business climate or investment climate (HALL & JONES, 1998; SUBRAMANIAN *et al.*, 2005; DOLLAR *et al.*, 2005; FAN *et al.*, 2008; MENSAH, 2012). Investment climate indexes have been used as gauges for the private sector and recently have been indicated as relevant instruments for improving public policy (WORLD BANK, 2005).

Thus, this paper aims to contribute to the discussion of the role that can be played by government in shaping the business environment to foster the achievement of the SDGs. In order to do that, a sector specific analysis has been carried out to the forestry sector in the state of Tocantins making use of the Forest Investment Attractiveness Index (FIAI) to further comprehend which areas of public policy intervention would be more relevant to support the development of a sustainable forestry sector. Tocantins has been selected due to its relevance both in terms of environmental importance as it is part of the legal Amazon region and is one of the frontiers of deforestation in Brazil.

1.1. Investment climate

The investment climate can be defined as the nexus of policies, institutions, physical infrastructure, human resources and geographical features that influence the efficiency of the companies and industries operation. While the macroeconomic aspects present the aggregate economy trends, the microeconomics affect the market structure and competition, exposing the sectorial behavior (WORLD BANK, 2014).

To provide to the market information about investment climate and to help to identify the barriers to be overcome in order to facilitate business, an increasing number of indexes have been development by a wide range of public and private organizations. Among the tools in the public domain are the Ease of Doing Business, Global Competitiveness Index, World Competitiveness Yearbook, European Competitiveness (HUGGINS & DAVIES, 2006; SCHWAB & PORTER, 2007; IMD, 2008; CASTRÉN *et al.*, 2014).

The Ease of Doing Business, developed by the World Bank, is the best-known index and focuses on the business regulation complexity and the importance about property rights protection. Its methodology aggregates information on specific activities related to business, such as: business opening, obtaining licenses to operate, registering property, accessing credit, protecting investors, paying taxes, foreign trade, contract compliance and company closure. As a result, it has become an important tool for countries to adopt more sophisticated changes for improving their investment climate (WORLD BANK, 2014).

1.2. The Forest Investment Attractiveness Index

The Forest Investment Attractiveness Index (FIAI) measures the performance of a geographic location related to investment climate factors that affect the direct forest investments success. Its methodology includes the element relevant to the forest sector, both those related to forest production and to the forest-based industry. By using general macroeconomic and competitiveness indicators, it also provides information for the private sector and the public. Nowadays, it is the most relevant public domain tool to measure the forest investment climate in Latin America (CASTRÉN *et al.*, 2014).

The FIAI is divided in three sub-indexes: (i) SUPRA Sectoral index; (ii) INTER Sectoral index, and; (iii) INTRA Sectoral index, as shown in Figure 1.

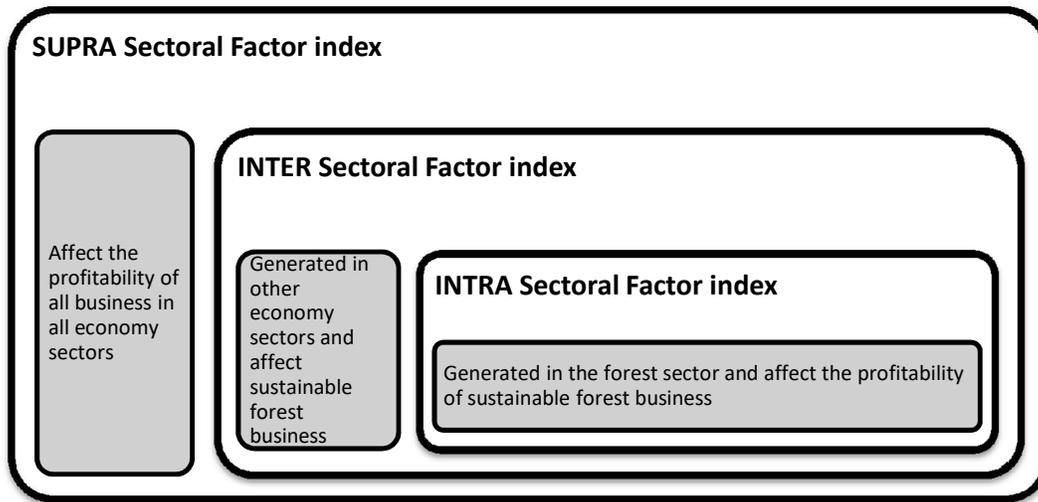


Fig. 1. Forest Investment Attractiveness Index's Theoretical Model. Source: Nascimento & Tomaselli (2007), adapted.

The general index uses the weighted average of SUPRA, INTER and INTRA Sectoral indexes, giving greater importance to the factors more related to the forest activity (NASCIMENTO & TOMASELLI, 2007; NASCIMENTO, 2012). The individual values of SUPRA, INTER and INTRA Sectoral sub-indexes are obtained by the average of the indicators corresponding to each index, as shown below.

$$FIAI = \left[\frac{1 \times (\bar{X}_{SUPRA \text{ Indicators}}) + 2 \times (\bar{X}_{INTER \text{ Indicators}}) + 4 \times (\bar{X}_{INTRA \text{ Indicators}})}{7} \right] \quad (1)$$

Because of the FIAI's indicators have quantitative information of different dimensions, the variables data were normalized. The SUPRA Sectoral values influence the performance of all economic activities and are divided into: (i) macroeconomic conditions: Gross Domestic Product growth, inflation, interest rate and exchange rate; (ii) tax burden and incentives, international trade, and; (iii) political stability and government transparency.

The INTER Sectoral factors refer to other economy sectors and include: (i) economic infrastructure: availability of transportation, communication and energy services at competitive prices; (ii) social infrastructure: availability of services related human development, such as health, education, basic sanitation and waste treatment, at quality and competitive prices; (iii) public services related to the company's activities; (iv) labor: labor legislation, productivity, wages, worker qualification; (v) financial resources access: financial and capital markets sophistication, credit availability at competitive terms, as well as other market instruments; (vi) rule of law existence: access to the judiciary, existence and feasibility of laws, existence of definition and law that establish and guarantee property rights, respect for contracts and justice speed; (vii) treatment of capital: barriers and restrictions on the movement of capital, into or out of the country; (viii) licenses and permits: bureaucratic procedures and legal requirements for the opening, operation and even closure of companies at a reasonable time, effort and cost.

The INTRA Sectoral factors are specific to the forestry sector and include: (i) forest resource: existence, availability and forest productivity; (ii) market: the consumer market size for forest product, including domestic consumption associated with exports; (iii) support to forest business development: policies and measures taken by the public and private sectors in order to reduce costs or maximize the investors benefits; (iv) forest vocation lands: includes land cover which, due to its physical characteristics of soil, topography and rainfall, should be maintained with forest cover of another form of sustainable use in

order to avoid negative externalities related to the soil and water; (v) adverse actions: policies and measures taken by the public and private sectors.

2. Methods and Procedures

The Forest Investment Attractiveness Index have applied for Tocantins state. To measure the investment climate related to the SUPRA, INTER and INTRA Sectoral factors, 12 indicators were used, involving more than 60 variables, according to Table 1.

Table 1. Indicators list, by FIAI's indexes.

Sub-Index	Measure	Indicators
SUPRA	GDP Growth Rate	State GDP
SUPRA	Political stability and government transparency	Political Stability and Transparency of State Government
SUPRA	Tax burden on GDP	Impact of taxes on productive activities
INTER	State economic infrastructure	Transport, communication and energy infrastructure, and the cost of wood freight
INTER	State social infrastructure	Health infrastructure, education and income
INTER	State licenses and authorizations	Number of procedures, deadlines and costs for obtaining licenses and authorizations
INTER	State labor force	Productivity and qualification of labor in general and forestry, and the cost of forest labor
INTER	Access to credit	Credit conditions in general and to obtain guarantees, and oficial lines/private banking system with financing for the forestry sector
INTER	State legal security and law enforcement	Definition and protection of property, the rule of law and effectiveness of contracts
INTRA	State Forest Resource	Surplus and stock of wood from planted and natural forests
INTRA	State domestic market size	Domestic consumption of forest products and inputs
INTRA	Regulated Forest Vocation Lands	Areas corresponding to the Land of Forest Vocation that have regular land tenure

Initially the index was calculated to all states of Brazil and then the Index is used to comprehend the specific issues related to Tocantins, by ordering the priority areas that are indicated for the development of the forest sector in the state.

3. Results

In comparison to other states, Tocantins scored 26.38, which corresponds to the 12th position of business attractiveness for the forest sector in Brazil. The results of FIAI application are summarized in Table 2.

Table 2. Summary of FIAI result for Tocantins, Brazil.

FIAI Component	Current Score	Potential Score	Differential	Potential Growth	Current Contribution	Differential Contribution
GDP Growth Rate	43.54	100.00	56.46	130	2.07	2.69
Political stability and government transparency	53.78	100.00	46.22	86	2.56	2.20
Tax burden on GDP	37.42	100.00	62.58	167	1.78	2.98
SUPRA Sectoral Index	44.91	100.00	55.09	123	6.42	7.87
Economic infrastructure	40.07	100.00	59.93	150	1.91	2.85
Social infrastructure	39.80	100.00	60.20	151	1.90	2.87
Licenses and authorizations	37.50	100.00	62.50	167	1.79	2.98
Labor force	54.48	100.00	45.52	84	2.59	2.17
Access to credit	22.57	100.00	77.43	343	1.07	3.69
Legal security and law enforcement	49.39	100.00	50.61	102	2.35	2.41
INTER Sectoral Index	40.64	100.00	59.36	146	11.61	16.96

FIAI Component	Current Score	Potential Score	Differential	Potential Growth	Current Contribution	Differential Contribution
Forest Resource	10.00	28.75	18.75	188	1.90	3.57
Domestic Market	3.84	5.40	1.56	41	0.73	0.30
Forest vocation land	30.00	35.00	5.00	17	5.71	0.95
INTRA Sectoral Index	14.61	23.05	8.44	58	8.35	4.82
FIAI	26.38	56.03	29.65	112		

It is also observed that the indicators that make up the INTRA Sectoral index do not have identical values for Potential Score because situations in which the investment climate will have the highest quality are based on hypotheses that consider physical, economic and social limitations inherent in each state. In this sense, even hypothetically a state could maximize the Forest Resource indicator, it would not reach the maximum score of 100 points. In this way, Tocantins could reach a maximum score of 56.03, representing a performance 112% higher than the current situation.

By ordering the FIAI indicators that could have the largest potential to enhance the business environment for the forest sector of Tocantins, the following have been identified and the most relevant: Access to credit (3.69); Forest resource (3.57); Tax burden on GDP (2.98); Licenses and authorizations (2.98); Social infrastructure (2.87); Economic infrastructure (2.85); GDP growth rate (2.69); Legal security and law enforcement (2.41); Political stability and transparency (2.20); Labor force (2.17); Forest vocation lands (0.95); Domestic market (0.30).

Each of the FIAI indicators is discussed in the next section in terms of policy implications for the state.

3.1. Credit access

Credit lines for the forestry sector are insufficient to Tocantins because they are essentially focused on planting and forest management, excluding the rest of the activities, which depends on general credit lines that are not suitable. In addition, the credit supply is divided between productive and environmental activities, such as preservation and forest recovery, hindering each one from being approached with the appropriated interest rate and credit conditions, as well as competing for the same sources of financial resources (CASTANHEIRA NETO *et al.*, 2010). Banks have also displayed disinformation on sustainable practices limiting credit lines to loans with shorter payback times.

It is relevant to indicate that many potential firms from sectors such as industrial processing and retail do not meet the minimum requirements requested by banks, including the lack of land ownership documents and absence of legal environmental compliance with the newly established Rural Environmental Register (RER), of the Brazilian Forest Code (STCP, 2014).

About the hurdles mentioned, the state policy maker has an extremely limited influence, since the rules, purposes and conditions related to rural credit are established at the federal level. In addition, changes in the form of access to credit can only be made at the national or regional level, further reducing the public policies impacts in this area.

3.2. Forest resource

The Forest Resource indicator refers to the forest availability in terms of coverage area and productivity. Presently, the eucalyptus plantations occupy the largest area in Tocantins and have reached a high productivity, guaranteeing the state competitiveness in attracting investments in productive forests.

Therefore, the performance improvement of this indicator would not be related to productivity, but to the expansion of the planted area, which could be promoted by the increase in the supply of commercial species seedlings (STCO, 2013; STCP, 2014). In regards to native forests, though there is still a large native flora extent in Tocantins, the predominant configuration has limited potential for sustainable forest management aimed at timber production, reducing its contribution for the large-scale development of a timber industry in different regions of the state (STCP, 2013).

The state government could develop a policy to promote the local forest resource, with a focus on the forest plantation expansion by the increase in the supply of commercial species seedlings and converting altered areas, such as degraded pastures, to planted forests.

3.3. Tax burden

The high tax burden, as in other economy sectors, is pointed out as one of the greatest obstacles to forest investment in the whole country, not only in Tocantins.

The tax issue influences all sectors of an economy, and the policy maker should examine the tax, contribution and fees structure, as well as current legislation. It is also necessary to investigate the specific impacts of the tax burden on the forest sector and how restrictive they are for the implementation of new projects. That is, it is necessary to evaluate the treatment given to forest investments by the main types of taxes or charges that apply to the sector: taxes on revenue, on land or the specifics of the forest sector (IDB, 2009b).

In 2013, the Brazilian Forest Service (BFS) has mapped the tax burden on timber products and proposed discharge measures on these tributes: (i) ICMS, PIS/Pasep and COFINS; (ii) IPI, and; (iii) a legal concept adjustment about "Agroindustry". It should be emphasized that the proposed measures deal only with the reduction of taxes, not indicating changes in the tax structure related to the forestry sector.

According to BFS, the ICMS tax can be made by Federal Senate Resolution, through absolute majority, by Complementary Law or by agreement with the National Council of Finance Policy, which, despite requiring the consensus of all its members, can be sustained it due to the socio-environmental appeal inherent in this proposal.

About the changes on PIS/Pasep and COFINS, the management of these taxes is a Federal Government's responsibility, which requires that this kind of projects to be processed in the National Congress. The IPI, in turn, has a significant impact on the tax burden of timber products and its reduction depends exclusively on the Exercise Power, through the Presidential Decree publication. Finally, the legal concept adjustment about "Agroindustry" aims to cover companies under a forest concession regime, which would benefit from INSS's differentiated taxation policies. This measure is made possible by the publication of a Provisional Measure that amends the Law No 10,256/2001 (SFB, 2013).

Therefore, it can be concluded that the Tax burden on GDP indicator cannot be changed by the Tocantins government, nor is it an aspect that differentiates the Brazilian states and, consequently, constitutes a source of competitive advantage.

3.4. Licenses and authorizations

Licenses and authorizations correspond to a type of command and control instrument used by environmental agencies to allow the installation and operation of projects and economic activities that cause environmental impacts (MARGULIS, 1996). The Brazilian forest policy is fundamentally focused on the use of this instrument type, with an immediate impact on Brazilian states (CASTANHEIRA NETO *et al.*, 2010).

For licenses and authorizations to work satisfactorily, the licensing agent must frequently monitor the

licensed agents to impose penalties on violators, which gives this instrument type high administrative and transaction cost (TEIXEIRA, 2003). Given that the resources earmarked for inspection compete with sectors where social returns are extremely high, such as health and education, there are problems in the forest policy execution, reflecting the State's institutional incapacity to properly manage the licensing processes (MARGULIS, 1996). Consequently, in Brazil, the average term for obtaining an environmental license for the realization of a forest-based industrial project is 120 days. According to D'Ávila (2015), even with the Rural Environmental Register, this reality should not be changed significantly.

In this way, the FIAI result for "Licenses and Authorizations" indicator points to the need to improve state regulation, aiming to reduce transaction costs, fees and licenses (CASTANHEIRA NETO *et al.*, 2014). However, the methodology for calculating the indicator uses as proxy data about the company opening in the state Business Boards and the state institutional capacity to implement public policies, which tends not to adequately reflect the context of bureaucracy in environmental agencies. Thus, for the results to reflect the reality of forestry companies, the FIAI should be modified from structural calculation methodology by adding indicators that also reflect the bureaucracy faced by forest companies.

3.5. Social infrastructure

Social infrastructure corresponds to the human development degree in Tocantins. In this respect, it was verified that the Human Development Index for this state went from 0.369 to 0.699, between 1991 and 2010, corresponding to a growth of 89%. Despite being considered a high development, the HDI of Tocantins is still lower than the average of Brazil (STCP, 2013).

The cities with a better infrastructure and income, like Palmas, Araguaína and Gurupi, have the highest rates, while several cities in the Bico do Papagaio and Jalapão regions have a significantly lower HDI rate (STCP, 2013). In this sense, the policy maker could work on improvements in education, health and basic sanitation, especially for the northern region of Tocantins.

3.6. Economic infrastructure

There are two features linked to economic infrastructure considered relevant to forest investment in Tocantins. The first aspect concerns to transportation, especially in the operationalization of water transport in an efficient way and able to meet the demands of the forestry sector. For this, some constructions are necessary, mainly dam locks, that prevent the waterways use as one of the main transportation modes in the state.

The second aspect is related to electric power supply, which has a strong impact on the relationship between processed wood products and other materials through the tariff value charged (HOEFLICH *et al.*, 2007). In this regard, the FIAI shows that Tocantins has the eighth largest electricity cost among Brazilian states. Therefore, the policy in the state should focus on increasing the water transport participation in the flow of forestry production and the reduction of costs in the electric power supply in the state.

3.7. GDP growth rate

The GDP rate presents a general framework very close to the economic activity of a given country or locality, besides being a measure of the products and services produced values. As a result, a high GDP growth almost always reflects a dynamic economy and a favorable environment for investments, including forestry, with increasing levels of consumption, production and business opportunities (IDB, 2009a). According to the FIAI results, Tocantins was in 12th place in terms of GDP growth rate.

For improving this indicator performance, the policy maker must gather information on the economic

performance of Tocantins and, above all, forest GDP, which corresponds to the total produced by the forest production chain. It is also important to analyze which the economy subsectors have the greatest impact on forest GDP and what the forest sector participation in the state GDP (IDB, 2009b). However, the FIAI does not present information that could assist the policy maker in measuring Forest GDP or differentiating sectors of the economy that could assist in forest development.

3.8. Legal security and law enforcement

The guarantee of legal security and law enforcement in a given geographical unit is a factor that attracts investments, especially in the forest sector (IDB, 2009a). In this sense, one of the themes related to legal security, but not fully captured by the indicator, corresponds to the acquisition of land by companies with foreign capital and the absence of a solid regulation on the subject, which significantly impedes the new projects implementation of forest plantation.

The public authority, in this regard, cannot establish specific policies that improve the Tocantins performance in relation to this indicator, and is restricted to only a few specific actions. Therefore, it can be concluded that "Legal Security and Law Enforcement" indicator cannot be directly fomented by the policy maker. Thus, policy should focus on a clearer establishment of property rights, mainly foreign-owned companies.

3.9. Political stability and transparency

In relation to political stability and transparency, the FIAI methodology used as proxy the arithmetic average of the indicators about the state institutions that are part of the Brazilian states integrity system, elaborated by Speck and Ferreira (2012). These indicators are related to transparency in the different phases of budget execution, bidding modalities, internal control, among other points. In this regard, the FIAI pointed to Tocantins with the 8th best integrity system among the Brazilian states. As the indicators analyzed are all linked to the state and district levels, the FIAI becomes an information tool that can assist public policy makers in Tocantins in an objective way.

3.10. Labor

The variable with the greatest weight in the "Labor" indicator result is the cost of the forest labor force. In this regard, Tocantins presented the 1th lowest forest worker remuneration among all Brazilian states, constituting one of the most outstanding characteristic of the agricultural frontier areas.

Therefore, the aspect related to the labor that must be worked in Tocantins is the worker qualification. To assist in this task, there are different institutions related to the forestry research and human resources training that, together with the large private forestry companies which are settling in the region, can collaborate with the labor force qualification in Tocantins. Among them are: SENAR/TO, SENAI/TO, universities, like UFT, which has a Forestry bachelor course and the Agricultural College of Natividade (STCP, 2013).

The labor productivity question, which in the last decade, has not accompanied the real increase in wages, which in turn has more than doubled in Brazil. In this regard, the result of the intermediate indicator about labor productivity for Tocantins was in 18th place in relation to the other states. Thus, it can be concluded that "Labor" indicator can be worked by the forest authority in Tocantins, focusing on qualification and labor productivity increase.

3.11. Forest Vocation Lands

Tocantins has a high potential for the forest plantation establishment, represented by the wide availability of lands with forest aptitude, especially for eucalyptus, teak and rubber trees (STCP, 2013; STCP, 2014). However, the FIAI result linked to land tenure pointed to a situation distinct from the literature for the state. While data from INCRA (2013) indicate that a significant majority of land in the state is titled (93.14%), other authors indicate a percentage of real estate certified at around 30% by 2014.

This is probably due to an inconsistency of the data provided by the National Institute of Colonization and Agrarian Reform (INCRA in Portuguese), which considers as titled property those that can be registered in the Registry of Real Estate. According to the INCRA technicians, there is the possibility of polygon overlapping of the properties registered in the state registries. In fact, the way rural properties are registered in the registry offices is a recurring problem throughout the country, leading to land disputes in court.

To soften this land tenure issue, Tocantins can establish a land regularization program for real estate on state land. In addition, the RER can evidence the polygonal overlaps the rural properties and thereby create a more favorable environment for the resolution of land ownership. Therefore, it can be concluded that "Forest Land Vocation" indicator can be worked by the forest authority in Tocantins.

4. Conclusions

The FIAI results indicate that Tocantins occupies an intermediate position in relation to the rest of Brazil, as well as high productivity potential and low production costs, mainly related to the price of land and the labor force. They also show that policy makers should prioritize access to credit; forest resource; tax burden; licenses and authorizations; social infrastructure; economic infrastructure; GDP growth rate; legal security and law enforcement; political stability and transparency; labor; forest land, and; domestic market.

It is worth noting that the states have limited power to modify the rules of access to credit or tax burden, since they are homogeneous for several states in the region. However, FIAI indicates the possibility of fostering the state market by modifying issues related to state licenses and authorizations, transparency and legal security, and social infrastructure. However, additional complementary analysis is necessary so that the results can be used to reflect the real possibilities that the state has in establishing public policies that make its forest sector more competitive and sustainable.

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