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EFFECTS OF FINANCIAL SPATIAL GAPS ON LOCAL GOVERNMENT OFFICES IN HAITI. THE CASE OF THE MUNICIPAL BUDGETS OF 2017–2018

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ABSTRACT

For decade Haiti's development was thought to be the prerogative of the central authorities who conceived, in national logic, strategies for this purpose without necessarily considering the subnational specificities. This vision of the development of the territories emerged from a unique context and history that would therefore imply a unique development logic. By taking the case of studies the budgetary allocations to the Haitian communes for the fiscal years2017–2018, we want to demonstrate that the logic of allocating the financing of local authorities is neither neutral nor strategic. The purpose of this article is twofold. First, it is to model spatial disparities and structural instability in the national territory. Secondly, it is to study the differences in space and to explain the inclusiveness and complementary nature of the territorial development process.

Limited analysis of the communal allocations of budgetary appropriations reveals two major anomalies in the financing logic of these territories. The first anomaly considers the legitimization of territorial and socioeconomic disparities that comes from an unenlightened choice of leaders to design Haitian territory and the proximity relations between the localized actors. The second anomaly is found in the lack of vision or global consideration in the national strategy for territorial development. The Haitian State cannot therefore make a planned and strategic management of the territory because it is too dependent on the economic events.

Keywords: Territorial Development, Spatial Disparities, Proximities, Local Financing, Territorial Nesting

INTRODUCTION

The debate on local development places local actors and territorial specificities at the heart of the process of transforming the territories. This process, with the aim of improving the conditions and quality of life of the population, implies mobilizing resources for the provision of local public goods and services (Pecqueur and Vicente, 2000; Providence, 2015). Two non-exclusive dynamics can contribute to the mobilization of these resources. It is first the

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institutional densification which assumes the way in which local production is made to create wealth and finance common projects. Secondly, we find the voluntarist actions of transforming a territory by actors outside this territory (mobilization of technical, financial resources, etc.). This approach refers to other horizons such as international diplomacy where people seem to interact in planning for territorial development.

For a long time in Haiti, development was thought to be the prerogative of the central authorities who conceived, in national logic, strategies for this purpose without necessarily considering the subnational specificities. Despite the adoption of decentralization as a means of reinvigorating national levels, there are several reasons why spatial disparities are indicative of the lack of political will in collective development choices. If one admits (in speeches) the principle of local participation in the project of the territories, the experiences of the last thirty years prove that it is a hollow vow.

This vision of the development of the territories emerged from a unique context and history (with the Constitution of 1987) which would therefore imply a single development logic (Providence, 2015). Thus, local development is primarily the business of actors of all kinds, connected, mobilized to stimulate a creative synergy and bearing of development effect (Le Loup et al., 2003).

Purpose of the Study

This purpose of this longitudinal quantitative researchis to examine the funding process of the Haitian communal communities responsible for territorial development planning. This responsibility imposes the provision of public goods and services of proximity to local people who contribute through the mechanisms of the local finance laws to the financing of their territories. In the research on the underdevelopment of Haiti, this financial instrument has never been analyzed as a strategic tool for combating socio-economic and territorial disparities (Providence, 2015). There are then two principles: the principle of the financing of local authorities and that of their nesting which implies the competition of the territories. These principles invite to consider the level of intermediate aggregation of departments and communes which are taken in neighborhoods' relations both in relation to the transversal nature of certain common problems and by the specificities of each communal territory.

By taking the case of studies the allocations of budgetary appropriations to the Haitian communes for the fiscal years2017–2018, we want to demonstrate that the logic of allocating the financing of local authorities is neither neutral nor strategic. To do this, the aim is to mobilize tools of space Econometrics to model the two phenomena mentioned above, as is the case in many works: Cliff and Ord (1981), Upton and Fingleton (1985), Griffith (1988), Anselin (1988a), Anselin (1988b), Anselin and Griffith (1988), Haining (1990), Cressie (1993), Bailey and Gatrell (1995), Anselin and Bera (1998), Le Gallo (2000), Le Gallo et Ertur (2000), Fotheringham, Brendon et al. (2000). The objective of this article is twofold. On the one hand, the fact of working on geographical data concerning communal budgets and the financing of territories by the law of Finance of 2017–2018 allows us to model spatial disparities and structural instability in the territory National. Spatial statistics processed from the statistical

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analysis software R facilitate the Cartographic presentation of these disparities. On the other hand, the lack of independence in the allocation of appropriation makes it possible to conceive a model of spatial analysis (neighborhood relationship) in order not only to study the variations in space but above all to explain the inclusiveness and complementary to the territorial development process.

Research Questions and Hypotheses

The following questions attempts to determine if there is a change one variable in this longitudinal study of financial spatial gaps of local government offices in Haiti. Within this study we will consider the case of the municipal budgets of 2017–2018. The longitudinal is known or contained a measurable effect on another variable or set of variables within that same area. Hypothesis is a formal statement that presents the expected relationship between an independent and dependent variable (Creswell, 2002/2013). Hypotheses are single tentative guesses, good hunches—assumed for use in devising theory or planning experiments intended to be given a direct experimental test when possible (Rogers, 1966 as cited by Guillaume, 2019).

Question 1 and Hypothesis 1

Q1- Are they any differences on financial spatial gaps on local government offices in Haiti?

- H1 —There are differenceson financial spatial gaps on local government offices in Haiti.
- Ho—there are no differences on financial spatial gaps on local government offices in Haiti.

Question 2 and Hypothesis 2

Q2- Is there a significance difference inthe financing logic of the territories toconsider the interdependencies in terms of territorial nesting and result in territorial intelligence?

- H1—There is a significance difference in the financing logic of the territories to consider the interdependencies in terms of territorial nesting and result in territorial intelligence?
- Ho—there is nota significance difference in the financing logic of the territories to consider the interdependencies in terms of territorial nesting and result in territorial intelligence?

Theoretical framework

The theory that guides this research is"Principal-Agent Model and Budget Theory" **(p**ublic budgeting), byKhan, and Bartley Hildreth (2002), as a field of study, has grown tremendously in recent years both in form and substance. With such growth comes a need to have a coherent theory or body of theories that allows one to understand the field, its essential core that guides its development, and its scope for dealing with real-world problems. Wildavsky

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(1961) reminds us, budgeting is more than allocating the scarce resources between X and Y activities; it is about meeting the conflicting needs of a society by bringing about compromises in the political marketplace through incremental adjustment(s) in budget allocation. (Hyde, 1992.)Budgeting, according to Hyde, is partly political, partly economic, partly accounting, and partly administrative. As a political document, it allocates the scarce resources of a society among multiple, conflicting and competing interests. As an economic and fiscal document, it serves as the primary instrument for evaluating a jurisdiction's redistribution of income, stimulating its economic growth and development, promoting full employment, combating inflation, and maintaining economic stability. As an accounting document, it provides a ceiling on government spending and makes it legally binding for it to live within the allocated funds. Finally, as a managerial and administrative document, it specifies the ways and means by which public services are provided, and it establishes criteria by which they are monitored, measured, and evaluated. These seemingly divergent roles, that public budgeting plays further reinforce the general perception. As to why it is so difficult to have a single theory that can tie all these elements into a coherent theme.Khan and Hildreth (2002) introduced the principal-agent model and budget theory.

REVIEW OF LITERATURE

The case of the municipal budgets of 2017–2018 andthe data that is used come from the databases of the directorate of local finance, the Ministry of the Interior and territorial authorities (DFL/MICT) and the Haitian Institute of Statistics and Informatics (IHSI). Spatial analysis techniques will be mobilized to carry out the verification of our two hypotheses. This article is divided into three sections. The first section lays down the theoretical fundamentals of the territorial approach to development by focusing on public funding and local dynamics of intermediate aggregation. These two considerations invite reasoned political choices to allocate resources in order to develop territorial intelligence. The second section presents the spatial statistical analysis of the study data with the aim of demonstrating spatial socio-economic disparities through the phenomenon of heterogeneity in the budgetary financing of the territories. The last section discusses spatial interdependencies and its intensities, through the neighborhood relationship, in the analysis of the budget allocation for a territorialism development in Haiti. It is a question of explaining the phenomenon of spatialautocorrelations which affects the logic of financing territories and invites to develop a new territorial intelligence. Finally, in the conclusion of the work, the avenues for improving the strategy of public financing of the territory will be identified to allow a better questioning of the reality. The fundamentals of the territorial approach to development are a view to establishing a territorial intelligence. The concept of proximity in the provision of public goods and services to local actors is needed in the various works on the territorial approach to development (Pecqueur, 1989; Pecqueur and Vicente, 2000). It refers not only to moral values, beliefs, representations but also to the mode of coordination as well as the modalities of coordination. The proximity comes from the sharing of the same common point of view by the localized actors. It is a question of representations of a

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given situation with the effect of coordination between the localized actors (Providence, 2015) and whose foundation is none other than a "mutual field of influences" (Le Breton, 2004).

However, proximity seeks to explain the interactions of the actors between them, but also between the actors and their territory. First, the interactions between the actors and their territory implied the geographical proximity that respects single distance logic. This reflects both the principles of concentrating of Central Government services and the principles of decentralization that involve local actors in the management of their territory through local administrations. Secondly, the interactions between the actors underline the "organized closeness" which includes two logics. A logic of similarity (the community of beliefs and knowledge) that is accentuated by the ability of the actors to coordinate from a set of shared and approved rules (Kirat and Lung, 1995) and a sense of belonging (a shared framework of rules, routines and behaviors) of demonstrating the ability of an organization to interact with its members (Torre and Rallet, 2005). The notion of proximity is thus part of a dynamic of interaction between the actors and their territories and between the territories.

In fact, the territorial approach to development places localized actors and territorial specificities at the Center of local planning. It starts from the system of coordination between the actors involved in the development of their territory and necessarily refers to the political dimension of these interactions of proximity. This political dimension implies a regulation of collective action which involves the set of hierarchical powers in order to resolve certain socio-economic and territorial conflicts (Amable and Palombarini, 2005; Providence, 2015). All in all, these are the real issues of structural and social coordination, based on the common interests of the local actors.

In fact, the political construction of proximity stems from the way in which actors invent stability rules that can transform local initiatives by federating them in Network Dynamics for the production and consumption of goods and services. The territory itself becomes a competitive product and fulfills the role of welcoming human, material and financial flows. Thus, this implies the stability and reproduction of a system for the implementation of the well-regulated territories (Providence, 2015). All in all, the notion of proximity (geographical and organized), from the point of view of a "social system," can be desired or suffered (Searle, 2005). The desired closeness often gives rise to a collective agreement on the projects and their financing, while the proximity suffered reflects the conflict between the actors located on the nature of the socio-economic links and the choices for the project of their territory.

This policy of implementing the territories must be based on a climate of trust between the various actors to achieve a territorial intelligence. The latter is the combination of political intelligence based on the desired proximity and economic intelligence that refers to the mode of financing of the territories. This approach to proximity relations, with its political dimension, appears to be an institutional fact. The proximity thus exceeds the notion of "low distance," because the actors are both interacting (geographical proximity) and coordinate cognitively and politically (organizational proximity) in a logic of collective action (Providence, 2015). It is a matter of overcoming a simple economic intelligence based on the understanding of the

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challenges associated with the provision of local public goods and services which implies strategic and territorialism planning of the process of national development.

Any national development strategy should be based on a clean territorial intelligence involving the harmonious construction of the "different territorial levels." It relies, among other things, on a renovation of the State by means of adapted industrial and sector policies and a conscious development of the territory. A change in the strategy for the development of the territories is, of course, in the realization of the changes in the rules of the world geopolitical and geo-economic games. Thus, the action of the State, in the new global configuration and for the most fragile countries, appears indispensable to create networks of localized actors capable of coping with productive and commercial challenges (Providence, 2015).

Territorial intelligence is interested in territorial prosperity (job creation and social cohesion). It seeks to encourage local dynamics and strategically manage the diversity of different territorial levels through the creation of networks (Pautrat and Delbecque, 2009). This invites to make the territories visible (especially through public funding) while organizing economic vigilance to facilitate their growth and protect from employment. Territorial intelligence invites the creation of the synergy of the public authorities through strategic partnerships: public/private, public/territorial associations and public/diaspora. It is a question of the traditional modalities of public intervention in a competitive environment.

In the case of Haiti, territorial intelligence wants to associate the Haitian State with its local partners (territorial authorities) for better financing of the process of development of the territorial levels. It wishes to allow a positive impact on the supervision of the State and the financial framework of the territorial levels (creation and facilitation of networks). The main challenge for poor countries like Haiti is to create this dynamic of proximity between the actors and their territory, so as to initiate collective actions. In this sense, the State should play a catalytic role in the local development process by fostering proximity linkages and establishing the basic principles of territorial competitiveness. "The aim is to bring together and cooperate in a territory of the companies in the same sector, public services, universities and research centers" (Pautrat and Delbecque, 2009:25).

The development of a territorial intelligence poses the problem of spatial planning, but especially that concerning forms of financing of public goods and services. She is interested in the construction of operational networks whose privileged mode of operation is transverse and horizontal. Territorial competitiveness operates through cooperative networks that exceed the simple logic or competence of enterprises (Providence, 2015). Thus, the creation of competitiveness poles is a strategic choice of proximity policy that places territorial intelligence at the Center of any territorial financing logic.

In Haiti, the principles of decentralization require the intervention of all local elected representatives in the planning of the economic development of their territories. Thus, each territorial level could "display their identity and value their potential from projects carried by local actors themselves" (Chauchefoin, 2001:6). Local authorities would seek to define,

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alongside the central state, regulatory instruments that could accompany investment initiatives within the framework of territorial intelligence. Unfortunately, they are not yet able to create strong links between all the localized actors (both public and private) in order to enable them to increase the intensity of their relationship.

Territorial intelligence also means developing a form of "territorial governance" capable of reconciling the organizational logic of the localized actors with the geographical stakes of local planning. It is necessary to be able to create proximity interdependencies under the arbitration of local authorities. That being said, the development of territorial public policies (at the departmental level) requires questioning the organizational choices of funding for the territories. In addition to the need for public decision makers to provide and maintain public goods and services, it is essential to facilitate the sharing of information for the consideration of local socio-economic initiatives (Providence, 2015). Local public policy-makers can facilitate the establishment of this "territorial governance" which will aim to "better anticipate the evolution of the territory through a finer intelligence of economic contexts and business strategies" (Chauchefoin, 2001:9).

In summary, two major complementary approaches are in fact possible when we want to deepen the relations of proximity in the planning of territorial development. A first approach by "territorial competitiveness" and a second by the "networking of localized actors." As a result, the territory must be conceived as a dynamic political and socio-economic space, exceeding a simple territorial or institutional decoupage (Cinconiegue and Pecqueur, 1992). The territory is in this case a historically constituted building, based on relations between the localized actors and on which the public policies are available in localized public actions. The merit of this territorial approach to development is to consider proximity as a positive factor of development by bringing it back to the notion of "territory" (Pecqueur and Vicente, 2000; Providence, 2015).

METHODOLOGY

The aim of this quantitative study is to examine the effects of financial spatial gaps on local government offices in Haitiat the approach of development territorial of Perroux. According to growth poles theory the propulsive pole is a business unit (a company, industry) or a set of these units and these units are the main force of the economic development as they generate growth through the impact of strong input-output linkages (Perroux, 1955). The main author of growth poles theory, created in the 1950s, was François Perroux (1903–1987). The key and the most important theoretical foundation of the whole concept was Perroux's argument which explains the procedure of economic growth in the following way: It is a blunt and indisputable fact that growth is not uniform in different places but growth has different degrees of intensity in different points, or poles, and then it spreads via channels and its final result for the state economy is different in different regions.All other industries, which lack the strong character, are called propelled. To summarize, in this theory the economic development of a region depends on the intensity of the propulsive industries on the propelled.

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This study will use an autocorrelation and a variant of a random utility model that takes a probability distribution over preference relations as its primitive data. We are using a linear programming approach to partial identification and show how to obtain bounds on probabilities of any ordering relation. The autocorrelation for an observation budget and an observation at a prior time step will be comprised of both the direct correlation and indirect correlations. These indirect correlations are a linear function of the correlation of the observation, with observations at intervening time steps within this research.This study on the financing of the communal territories by the law of local finance 2017–2018 builds on the notion of proximity to emphasize the local and global character of the national development process. It seeks to demonstrate this by the logic of spatial distribution of appropriations that can reveal the opposition of agglomeration forces and dispersion in this logic of financing of the Haitian State. Thus, it is a question of understanding two phenomena that appear in this logic of financing the communal territories in Haiti: spatial heterogeneity and autocorrelation. This study will seek to determine is there any differences in communal territories. Once data has been collected, it will be analyzed, and conclusions can be made.It is predictive in nature and typically because we have significant knowledge already on the subject which allows the prediction to be made. As an appendix to this budget and to better understand the choices and the explanations of the government, we will analyze succinctly the 2017–2018 budget of the Minister of Economy and Finance before parliamentary committees to defend his budget.

ANALYSIS OF THE STUDY

To analyze spatial disparities in the financing of communal territories, we use the tools of spatial analysis of georeferenced data to demonstrate the phenomenon of spatial heterogeneity. This phenomenon assumes that each territory is specific not only by its physical configuration but especially by the proximity links developed by the localized actors. The financing of each territory should respond to a strategy of project implementation from local specificities in a logic of complementarities or neighborhood. The variables mobilized, in order to explain spatial disparities, through the documents of budgets of the communal communities, are the following: o the own receipts composed of the CFPB (land contribution of the built property), the patient, the other tax revenues and non-tax revenues;

1. the endowment of the territorial authority management and Development Fund (FGDCT);
2. extraordinary receipts;
3. operating expenses;
4. capital expenditures;
5. demographic variables (population, area, etc.).

For the need of this study, we use ratios that will be processed from the software R spatial analysis packages, which allows us to map the reality studied. Thus, the different ratios are aimed at demonstrating these territorial disparities. Figure 1 shows the spatial distribution of the Haitian population according to the approximate number of inhabitants living in each commune and their density (per square kilometer). Thus, more than 70% of the communes have a

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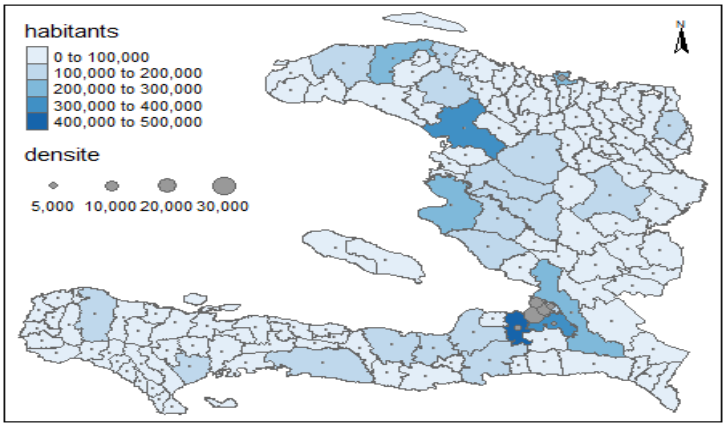
workforce of 100,000 inhabitants. This is the general tendency in all the Department of the country except for the West and the Artibonite or the Nobre per commune seems to be very eviler. The second major trend on the map comprises the communes whose population varies between 100,000 and 200,000 inhabitants. The six communes of the metropolitan area of Port-au-Prince (Pétion-Ville, Delmas, Port-au-Prince, Carrefour, Cité Soleil and Croix-des-Bouquets) host at least 300,000habitants each. The communes of Cap-Haitian, Port-de-Paix, and St-Marc registered a workforce of between 200,000 and 300,000 inhabitants.

When we look at the distribution for the variable density of the population, there is a strong concern in the metropolitan area of Port-au-Prince (between 10,000 and 20,000 inhabitants per square kilometer per town) and Cape Haitian with a density of about 5,000 inhabitants per square kilometer. The other communes of the country have a much more moderate density of fewer than 5,000 inhabitants in the square kilometer. This spatial concentration would have the advantage of accentuating urbanization, but the lack of public infrastructure and the absence of real spatial planning schemes or plans have allowed the development of shanty towns and constructions anarchical. In fact, the question of land management can be posed by focusing on the pressure exerted, for example, on water resources.

Figure 1: communal distribution of the Haitian population/density



Sources: presentation of the author from the IHSI data of 2015

This map (Figure 1) provides a better understanding of spatial disparities from the density variable that brings the population of each city to its area. This indicator confirms the two trends in the communal distribution of the population in the sense that the communes of the two highest density departments remain West and Artibonite. These observations also make it possible to foresee the options for the development of Haitian territory, knowing how much it is necessary to combat phenomena such as anarchic constructions, poverty and social exclusion, crises recurrent socio-political, etc.

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However, spatial distribution invites public policy-makers to better think about localized public actions, stemming from public sector policies, in order to provide public goods and services tailored to the needs of taxpayers. As a result, localized public actions derive in large part from the strategy of local authorities to exercise the powers conferred on them by the laws of the Republic. The financing of communal communities must therefore facilitate our understanding of the Haitian State's strategy to finance territorial development. Which strategy can also reveal the choice of leaders to maintain, see even strengthen, socio-economic and territorial disparities? Before presenting the data on the capital expenditure and on the functioning of the communes, it is necessary to analyze the spatial distribution of the own receipts of these communal communities. The aim is to understand the contribution of the actors located according to the principle of financing public actions by tax.

In fact, Figure 2 discusses the communal distribution by presenting the interaction between the own receipts and the number of inhabitants for each communal territory. First, the own receipts are represented on the map under the name "financement0," the terms of which are as follows: fewer than 5 million gourdes, between 5 million and fewer than 10 million, between 10 million and fewer than 20 million, between 20 million and fewer than 30 million, between 30 million and fewer than 40 million, between 40 million and above. Then, the indicator "NB. Inhabitants" have five modalities: fewer than 200,000 inhabitants, between 200,000 and 400,000 inhabitants, between 400,000 and 600,000 inhabitants, between 600,000 and 800,000 inhabitants and from 800,000 inhabitants. The cross-analysis of these two variables will deepen the phenomenon of territorial disparities.

In terms of the contribution of citizens to the financing of their territory, the same spatial disparities are to be regretted. The communes of the Artibonite Department and the Western Department contributed at least 10 million of own-recipe gourdes. However, the most successful communes are to be noted as the six communes of the metropolitan area of Port-au-Prince (Carrefour, Port-au-Prince, Pétion-Ville, Delmas, Cité Soleil, Tabarre and Croix-des-Bouquets) and the commune of cabaret which have contributed to more than 50 million gourds each in the West while this performance was recorded in only two communes of the Artibonite Department: Gonaïves and St-Marc. This platoon of first-class communes is complemented by three communes of the Northern, South and South-East departments, the communes of Cap-Haitian, Cayes and Jacmel, respectively.

Figure 2: spatial distribution of tax collection/population

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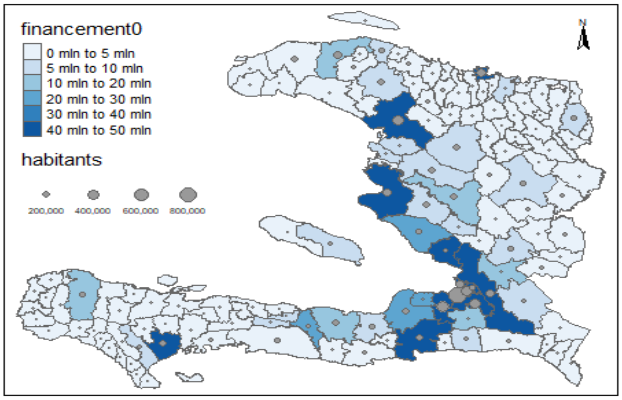

Sources: presentation of the author from the MICT data, budget 2017–2018.

The own recipes of the communes of the Department of Grand'Anse do not reach 5 million gourdes each with the exception ofJérémie, the capital, which records about 20 million gourdes. This is the same observation for the other departments (excepted the West and Artibonite) whose tendency in terms of their own recipes is less than 5 million gourdes. This is once again a serious spatial disparity that would explain the situation of extreme poverty in these territories and, above all, the inability of public decision-makers to think about the development of these localities. This disparity also calls for questioning the provision of public goods and services of proximity to the citizens of these territories. This implies looking at both the spatial distribution of investment expenditure and that of operating expenses.

Figure 3 shows the spatial distribution of investment expenditure relative to the localized population, which gives an idea of the supply of public goods in each communal territory. The number of inhabitants per commune is represented by circles ranging from the smallest, fewer than 200,000 inhabitants, to the largest agglomeration of 800,000 inhabitants and more. The variable "investment expenditure" is classified according to six modalities: fewer than 10 million gourdes, from 10 million to less than 20 million, from 20 million to less than 50 million, from 50 million to less than 90 million, from 90 million to less than 120 million gourdes and more than 120 million gourdes.

Figure 3: Spatial Distribution of Investment Expenditure/Population

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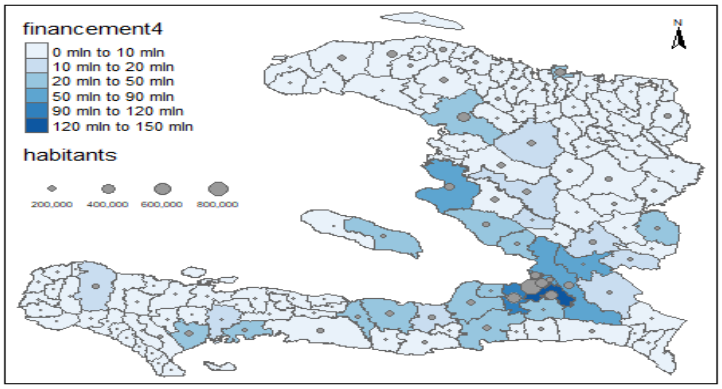

In Figure 3, there is a logic of financing the provision of public goods that accentuates the imbalances in the Haitian territory. The municipalities of the Department of the West receive the largest share of investments at least 10 million each, with a concentration of investments in the metropolitan area of Port-au-Prince. Thus, the municipalities of Pétion-Ville, Delmas, Tabarre, Port-au-Prince and Cité Soleil received more than 120 million gourdes while Croix-des-Bouquets Gantier and Carrefour have an endowment of between 90 and fewer than 120 million gourdes of investment expenses.

The financing dynamics of the other departments of the country seems to have adopted the rule of spatial disparities because it can be seen that even in some capital cities investment expenditure does not reach 10 million gourdes. This is the case of the Nord-Est, Nord-Ouest and Center departments in which all municipalities have an allocation of fewer than 10 million gourdes. This reality is slightly different in the department departments of South-East, South, Grand'Anse, Artibonite, Nippes and North where the exception is found especially in the staffing of heads-places which are included between 20 million and 50 million gourdes, in terms of investment expenditure. Once again territorial disparities are very visible in the logic of financing the provision of public goods that does not take into account the dynamics of distribution of local populations in the national territory.

Figure 4 shows the spatial distribution of the municipal allocation in terms of operating expenditure in relation to the number of inhabitants in each territory. This variable intends to inform us, this time, on the provision of local public services to localized actors. The terms for the variable are fewer than 15 million gourdes, from 15 million to less than 30 million, from 30 million to less than 45 million, from 45 million to less than 60 million, from 60 million to less than 75 million and from 75 million to 100 million gourdes. Figure 4 also assumes that this spatial distribution of operating expenditures is analyzed in relation to the number of inhabitants per municipality in order to record spatial disparities.

Figure 4: Spatial distribution of operating expenses/Population

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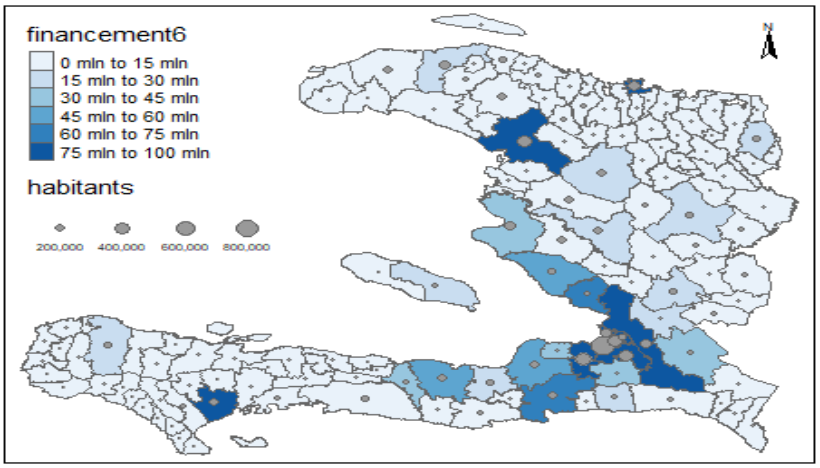

Sources: Author's presentation based on MICT data, 2017–2018 budget

As in the previous cases, the logic of financing communal territories by operating appropriations reveals the predominance of the metropolitan area of Port-au-Prince with its six communes, each of which absorbs at least 75 million gourdes. At the national level, only three other communes (Cap-Haitian, Gonaïves and Cayes), respectively Headquarters of the North, Artibonite and South departments, receive a similar allocation. In these three departments, the other communes, as in the other departments of the country, only less than 15 million gourdes is available to finance the provision of public services in each commune. Once again, it is necessary to note the extent of spatial disparities, which underlines the lack of an effective strategy to support the process of developing municipal territories.

All in all, the various indicators presented so far reveal an anomaly, in terms of spatial disparities, in the planning of the territorial development process by the municipal budgets. This is the phenomenon of spatial heterogeneity that is not taken into account in the logic of the endowment of municipal credits. The omission of this phenomenon results in not only the inadequacy of the supply of communal public goods in relation to the local populations but also the inefficiency of the local public services offered to the taxpayers in these territories. To complete this analysis, it is now necessary to identify the second spatial phenomenon that assumes autocorrelations in the choice of resource allocation to local communities.

The territorial nesting in relation to the financing logic of the Haitian territories by the communal budgets 2017–2018

The logic of financing municipal territories through budgetary allocations, in the framework of the provision of public goods and services of proximity, must be analyzed according to the principles of territorial complementarity and local competitiveness. It is about the integrated nature of the process of territorial development which invites to consider the geographical unit of the Haitian territory according to the local specificities. Thus, the communal territories are taken

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in neighborhood relations and these determine the local dynamics knowing that socio-political and economic phenomena extend beyond the territorial limits. Hence the consideration of territorial overlap to understand the spatial interactions that are considered, in the economic literature on territorial development, as the foundation of the "phenomenon of autocorrelations"(Providence, 2015). Thus, what happens on a communal territory depends on what happens on other communal territories, but it decreases with distance.

The autocorrelation assumes that georeferenced observations are not independent and even less neutral. To understand the interest of considering this dimension of the neighborhood, one must only accept that the following statement: "The total number of credits available to finance the provision of local public goods and services is distributed to all municipal territories according to a financing logic decided by the Haitian State". As a result, the more communal territory receives a larger share of initial allocation, the less the other territories will have a significant share. This supposes that the logic of distribution of credits can reveal the national strategy of financing the process of development of the country by demonstrating the poles of development which are defined or chosen by the public decision-makers. In other words, thanks to neighborhood relations it is possible to demonstrate the regional dynamics of the management of the communal territories, while identifying the atypical values that is to say, the anomalies in these regional dynamics of supply of goods and public services of proximity.Figure 5 presents the interdependencies in the territorial financing logic for one (1) closest neighbor. Three pieces of information are given in this figure. A map modeling the neighborhood relationship for a near neighbor, the spatial autocorrelation test with the Moran Index values expressing the intensity of the autocorrelation and the Moran chart test highlighting the atypical values in the dynamics regional.

Moran Index results whose value is I = 0.13, if rounded, confirm that there is indeed spatial (positive) autocorrelation between observations (Y) in each commune. That said, the value that "Y" takes in the communes, the financing of the communal territories for the supply of public goods and services of proximity, is influenced globally about 13% by the neighborhood. However, since the value of the probability is high, i.e., p-value = 0.089, the relationship is not significant. As this overall index of positive autocorrelations between observations does not allow to see the atypical locations, the Moran diagram is proposed to deepen the analysis in this neighborhood relationship.

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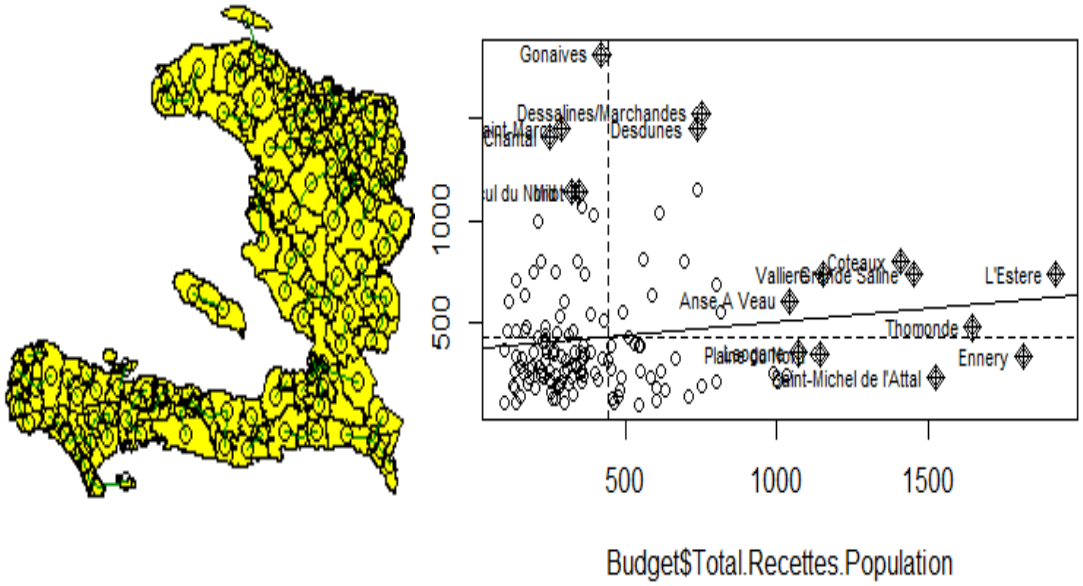
Figure 5: Moran tests for 1 nearest neighbour




```
Moran I test under randomization

data: Budget$Total.Recettes.Population
weights: dist1.lw

Moran I statistic standard deviate = 1.3474, p-value = 0.08893
alternative hypotheses: greater
sample estimates:
Moran I statistic       Expectation          Variance
      0.129400396      -0.007194245       0.010277899
```

Sources: Author's presentation based on MICT data, 2017–2018 budget

Indeed, in Figure 5 we see the distribution in the form of cloud points of the observations of "Y" in different locations. Thus, the plan is divided into four (4) framing in an orthonormal frame. The diagonal that cuts this marker demonstrates the two main trends in neighborhood relations: positive autocorrelations at the top and negative autocorrelations below the diagonal. In the

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diagram of Moran one can identify the first frame noted "HH" (joint associated with a high value surrounded by common associated with high values) in the top and on the right on the diagram, the second frame noted "BB" (common associated at low values surrounded by common values associated with low values) at the top left, the third frame noted "HB" (common associated with high values surrounded by common associated with low values) bottom and right and finally the fourth frame noted "BH" (common associated with low values surrounded by common associated with high values) bottom left.

On the Moran diagram for the nearest neighbor the quadrant "BH" records the highest concentration of observations. The latter supposes that there are deep spatial disparities and the financing of communal territories is not optimal, which would explain the phenomenon of impoverishment of Haitian localities. Also, it can be emphasized that the atypical values are found in the other three quadrants:

- BB with municipalities like Gonaïves, Chantal, Acul du Nord, Saint Marc
- HH with communes such as Marchant Dessalines, Desdunes, Vallière, Coteaux, Anse-à-Veau, L'Estère, Thomonde ;
- HB with municipalities like Ennery, Plaine du Nord, Saint Michel de l'Atallaye.

The communes of quadrant "HB" plus Tomonde represent a negative spatial autocorrelation along the diagonal. Thus, the Moran diagram makes it possible to detect the atypical localizations, that is to say the communes that deviate from the global spatial association scheme. That said, spatial autocorrelation can be visualized from Moran's "I" statistic, but it would be more detailed when Moran's local indices are presented later.

Figure 6 below shows the same analysis of Moran's tests for this time, two closest neighbors. The spatial distribution of the observations shows that there are positive spatial autocorrelations between the communal territories, with a Moran I index = 0.193. In other words, the intensity of the interdependencies between the values of "Y" (financing of communal territories in Haiti) is stronger than for the previous neighborhood relationship (the nearest neighbor) and the very low p-value (0.0042) assumes that the relationship is meaningful. Therefore, the values of our variable are explained at about 20% by the values it takes in neighboring communal territories.

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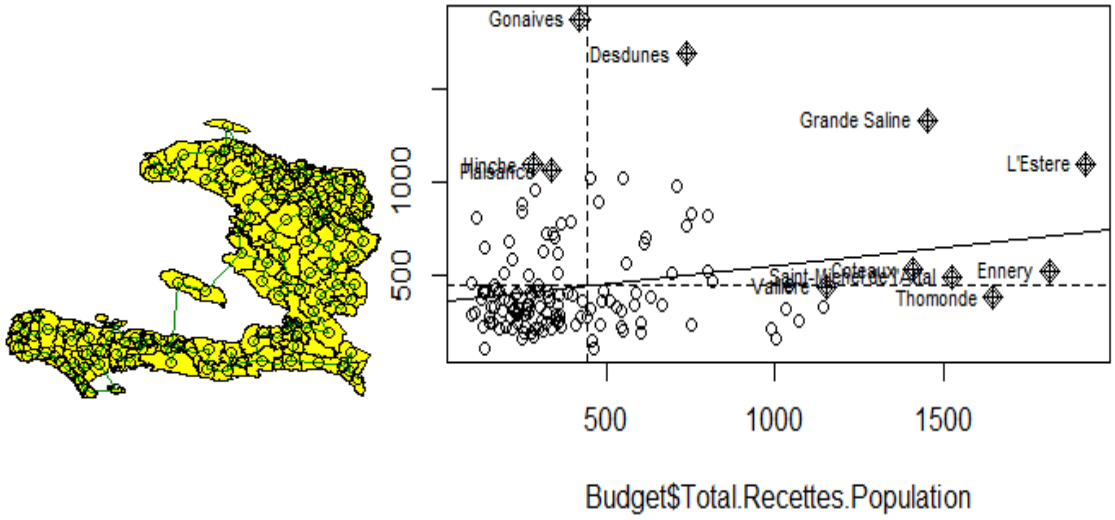
Figure 6: Moran tests for 2 nearest neighbours




```
Moran I test under randomization

data: Budget$Total.Recettes.Population
weights: dist2.lw

Moran I statistic standard deviate = 2.6394, p-value = 0.004153
alternative hypotheses: greater
sample estimates:
Moran I statistic       Expectation          Variance
      0.193451609      -0.007194245       0.005779039
```

Sources: Author's presentation based on MICT data, 2017–2018 budget

However, on the Moran diagram, in Figure 6, we see the same trend as above for the quadrant "BH" in which there is a high concentration. These are communes with high endowments that are surrounded by very small endowments. However, we note that the diagonal shifts slightly upwards to explain regional trends of negative autocorrelations. As for outliers or atypical values, the other three quadrants refer to trends in communal territories:

- BB with municipalities like Gonaïves, Hinche, Piacenza
- HH with municipalities such as Grande Saline, Desdunes, L'Estère, Saint Michel de l'Atallaye, Coteaux and Ennery ;
- HB with municipalities like: Vallières and Thomonde.

The communes of quadrant "HB" (Vallières and Tomonde) and quadrant BB (Saint Michel of Atalaye, Coteaux and Ennery) represent the aberrant values of a negative spatial autocorrelation

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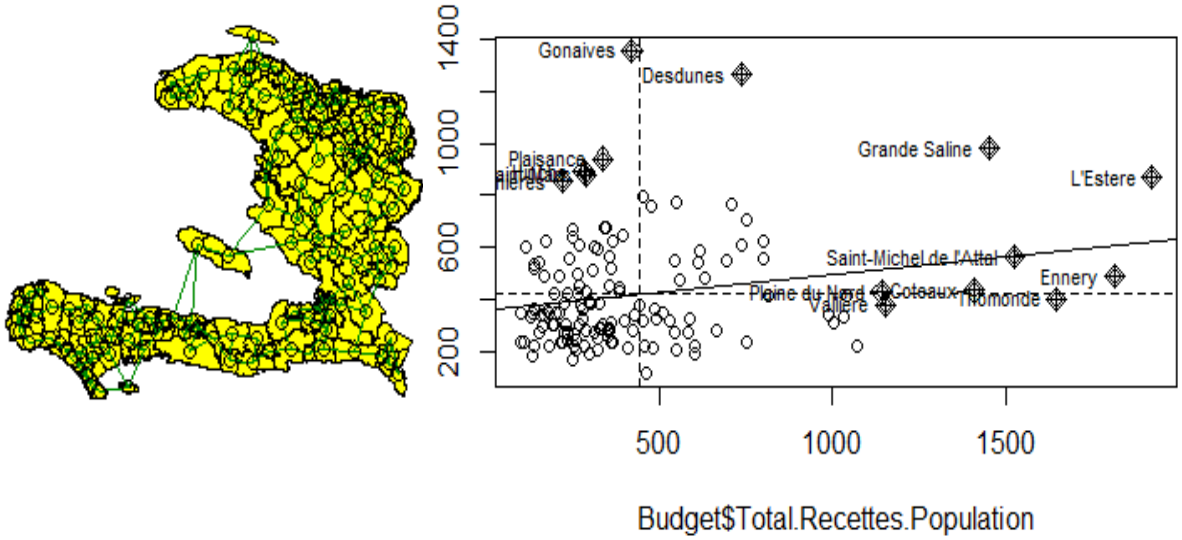
along the diagonal. Thus, the Moran diagram makes it possible to detect these atypical localizations on the Haitian territory, that is to say the communes which deviate from the global scheme of spatial associations.

Figure 7: Moran tests for 3 nearest neighbors




```
Moran I test under randomization

data: Budget$Total.Recettes.Population
weights: dist3.lw

Moran I statistic standard deviate = 2.2787, p-value =
                0.01134
alternative hypotheses: greater
sample estimates:
Moran I statistic       Expectation          Variance
      0.135422740      -0.007194245       0.003917079
```

Figure 7 shows the Moran tests for the distributions of observations with a matrix of three nearest neighbors. The map gives an idea of the spatial connections of the communal territories in this neighborhood relationship. The Moran Index again confirms the presence of positive spatial autocorrelations between the observations of our “Y” variables. According to the value of the Moran index, an influence of neighboring communal territories of around 14% is observed. The probability value of 0.0042 attests that the relationship is significant. This intensity is much

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higher than the data recorded for the nearest neighbor (Figure 5), about 13% (nonsignificant), but less than the intensity of 19% (significant) for two nearest neighbors.

In the Moran diagram of Figure 7, the following results should be highlighted:

- The "BH" quadrant has a high concentration of resource-rich communes surrounded by communes with very small endowments.
- The "BB" quadrant points to four communal territories with positive atypical values (Gonaïves, Plaisance, Vallières and Saint Marc)
- Quadrant "HH" highlights outliers in five communal territories. Four of these communal territories are found at the top of the diagonal (Desdunes, Grande Saline, L'Estère and Saint Michel de l'Atalaye) and an aberrant value in this quadrant found under the diagonal (Ennery).
- The "HB" quadrant highlights four other outlying values of municipalities such as Vallière, Plaine du Nord, Coteaux and Thomonde.

Figure 8 shows our last neighborhood choice (4 nearest neighbors) to analyze the spatial autocorrelation of observations on the different communal territories. The Moran global index once again underlines the presence of a positive spatial autocorrelation with a spatial interdependence of 13% (Moran I = 0.13) depending on the neighborhood. The value of the probability is low (p-value = 0.011), this supposes that the relationship is significant. This intensity reflects a downward trend in spatial interactions between neighboring territories with respect to the two previous intensities for respectively two nearest neighbors (20%) and three closest neighbors (14%).

In this figure 8, we also note that the Moran diagram shows a slight difference on the side of outliers in quadrants "HH" and "HB.' The trend of concentration of observations in the 'BiH' quadrant reflects territorial disparities in the financing of public goods and services in these areas. As for the distribution of atypical values, we can note:

- In the 'BB' quadrant, we find municipalities such as: Gonaïves, Saint Marc and Hinche;
- In the quadrant 'HH' there are the communes of: Marchants Dessalines, Desdunes, L'Estère and Grande Saline ;
- In the 'HB' quadrant, we have municipalities such as Saint Michel de l'Atallaye, Coteaux, Plaine du Nord, etc.

The Moran diagram is used to analyze the local spatial instability from the spatially shifted variable MZt as a function of the Zt variations (Ertur and Koch, 2005). Indeed, the values taken by the financing of the communal territories vary according to the location and even according to the national development strategy of the country. This will lead us to consider, in our analysis of neighborhood relations, the matrix with two nearest neighbors. The latter reflects the stronger influence of the neighborhood in the allocation of resources to local communities.

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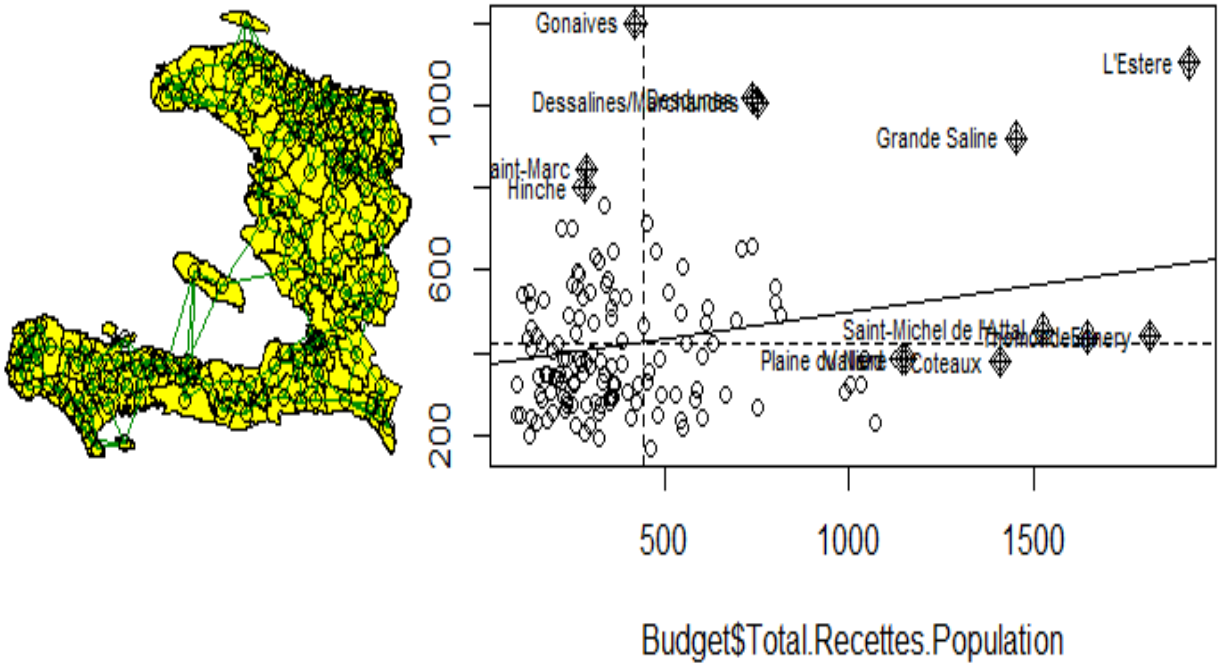
Figure 8: Moran Tests for 4 Nearest Neighbors



Moran I test under randomization

data: Budget$Total.Recettes.Population
weights: dist4.lw

Moran I statistic standard deviate = 2.5329, p-value = 0.005657
alternative hypotheses: greater
sample estimates:

Moran I statistic	Expectation	Variance
0.130523490	-0.007194245	0.002956320

To complete this analysis of the positive spatial autocorrelation for two nearest neighbors, the logic of financing communal territories, it will be necessary to use the local indices of Moran. The aim is to identify on a map the local pockets of spatial autocorrelations that will be useful to explain not only the influence of each municipal territory but also territorial groupings whose values can be either very weak, weak or strong. Or very strong and that draws the level of spatial autocorrelation upwards. In this case, the atypical values of communal territories whose endowments are different from their neighbors have become visible through the regional dynamics of spatial associations. Also, it is a question of quickly recognizing the spatial disparities in order to think any action of rebalancing of the territorial dynamics.

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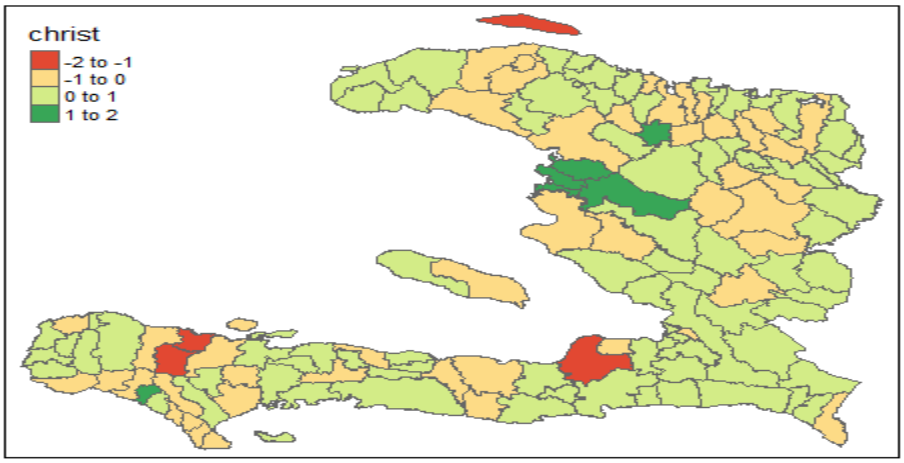
Figure 9 presents the map of the spatial distribution of Moran local indices according to the intensity or sense of interdependence between neighboring communal territories. And as for the global Moran index, the intensity of the neighborhood relations varies from] -1 to +1 [knowing that a value of the index equal to zero indicates a lack of autocorrelations. However, when the index is around -1, there are negative spatial autocorrelations and it will be positive when it goes to 1. Below this scale there will be negative outliers while above will be outliers. Positive.

On the map, the local aberrant values are "red" (from -2 to -1), the presence of negative local autocorrelations is "orange" (from -1 to zero), the presence of positive spatial autocorrelations is of "green" color and the positive outlier values are "olivegreen."

Figure 9: local autocorrelation indices of municipal territories



Sources: Presentation of the Author with R

In Figure 9, the negative outliers in three departments: the territory of "Turtle Island" in the North-West, the municipal territory of "Leogane" in the West, and the municipalities of "Beaumont" and "Coral" In Grand'Anse. Groupings of communal territories marked by the presence of negative spatial autocorrelations are distributed in all departments of the country, with the exception of West and South-East. Groupings of communal territories marked by the presence of positive spatial autocorrelations are also distributed throughout the Haitian territory. Finally, the positive outliers are found in the departments of the South (the only town of "Port-à-Piment") of the Artibonite (the Commune of Marmelade and a group of municipalities "L'Estère,""Desdunes""Grande Saline" and "Marchants Dessalines."

Reading figure 9 clearly shows the impact of the neighborhood in the understanding of the financing of communal territories by means of local budget appropriations. It allows us to see large pockets showing low funding in "orange" and areas where funding is stronger in "green." We see another pocket appear, which is in the Artibonite "Olivegreen," where the financing of these communal territories seems optimal.

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Conclusion

Considering spatial heterogeneity and autocorrelation phenomena has been a major contribution to the study of territorial disparities and the lack of effectiveness of the financing strategy for municipal territories by local budget appropriations. It has made it possible to go beyond the centralizing conceptions of the country's current development strategy to integrate the spatial dimension that places localized actors and their territories at the heart of the process. This is a questioning of budget allocation choices that seem to allow territorial disparities and cancels any territorial intelligence for an integrated development of municipal territories. The aim of this work was to use spatial analysis tools to demonstrate the inclusiveness and complementarity of the territorial development process.

Two axioms guided our spatial analysis of the logic of allocating local budget appropriations. First, it was necessary to demonstrate the discriminatory nature of the logic of financing municipal territories by local budgets leading to territorial disparities. Ratios are used, and a cartographic presentation of each ratio facilitates the study of these spatial disparities. Then, to measure the intensity of the spatial interdependencies of the communal territories to understand the scope of the territorial intelligence chosen by the logic of allocation of local budget credits. For this, spatial autocorrelation tests of geographical observations are used to understand the intensity of spatial interactions at the global level [Moran Global Index] and at the local level [Moran's Diagram and Moran's Local Indices].

Concerning the first axiom, the results for the various variables [own revenues of municipalities, investment expenditure, operating expenditure and local populations] show deep territorial disparities in the logic of allocation of budget appropriations. When we reduce the first three variables to the number of inhabitants [in Figures 2, 3 and 4] the discriminatory character of the allocation logic appears. This discrimination manifests itself in the provision of local public goods and services to localized actors by giving priority to the communal territories of the metropolitan area of Port-au-Prince and to certain departmental headquarters. The predicted relationship in Axiom 1 has therefore been confirmed by the observations.

Concernant le second axiome, les résultats des différents tests de Moran [les indices globaux et locaux et le diagramme] ont détecté la présence d'autocorrélation spatiale entre les territoires communaux. Du plus proche voisin à quatre plus proches voisins, les intensités des relations de voisinage attestent que les interdépendances territoriales sont très significatives et déterminent des poches de similitude [positive ou négative] capables d'expliquer les dynamiques régionales. Autrement dit, ces résultats démontrent le caractère inclusif et complémentaire de toute logique de financement des territoires communaux à des fins de produire du développement territorial. Quand on ne tient pas compte de ces interdépendances spatiales, la logique d'allocation budgétaire ne contribue pas à une véritable intelligence territoriale. Ce qui confirme la relation prédite dans l'axiome 2 de notre travail qui supposait que la logique de financement des territoires communaux par les crédits budgétaires ne tient pas compte des interactions spatiales entre ces territoires.

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The spatial analysis of the municipal budget allocations reveals two major anomalies in the financing logic of these territories. The first anomaly considers the legitimization of territorial and socio-economic disparities that comes from an uninformed choice of leaders to conceive the Haitian territory and proximity relations between actors located on a discriminatory basis. Hence the formula: "All by and for the metropolitan area of Port-au-Prince". We must simply take as examples the anarchic constructions through the Republic, the rural exodus, etc. The second anomaly is found in the lack of vision or global consideration in national strategies for territorial development. The Haitian state cannot make a forecast and strategic management of the territory because it is too dependent on the conjectural events.

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