The intergovernmental system of transfers for WASH in Colombia: redistribution for who?

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Keywords

- System of intergovernmental transfers
- Distribution criteria
- Sistema General de Participaciones
- WASH
- Drinking water and sanitation
- Decentralization
- Public service provision

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List of abbreviations

CRA - Comisión de Regulación de Agua Potable y Saneamiento Basico (Regulatory Comision of Drinking Water and Basic Sanitation)
DANE - Departamento Adminsitativo Nacional de Estadística (National Statistics Office)
DNP - Departamento Nacional de Planeación (Colombian National Planning Office)
FUT - Formulario Unico Territorial (Unified territorial form)
ICN – Ingreso Corriente de la Nacion (National Current Revenue)
INS – Instituto Nacional de Salud (National Health Institute)
IRCA – Indice de Riesgo de la Calidad del Agua (Water Quality Risk Index)
SICODIS – Sistema de Información y Consulta de Distribuciones de Recursos Territoriales (Information and consultation system of territorial resource distribution)
SGP - Sistema General de Participaciones (Colombian system of intergovernmental transfers)
SGR – Sistema General de Regalias (Colombian system of royalties)
WASH- Traditionally understood as Water, Sanitation and Hygiene. Here referring to the Spanish acronym of APSB- Agua Potable y Saneamiento Básico
SSPD- Superintendencia de Servicios Publicos Domiciliarios (Superintendence of residential public services)
SUI - Sistema Único de Información (Public Service provider reporting platform)

1. Presentation of the research problem

1.1 Why decentralization?

The role of the intergovernmental system of transfers -SGP[1] in the redistribution of resources for water and sanitation – WASH arises from the decentralization process in Colombia. This process was a response to the prominent legitimacy crisis in the 80s (Maldonado and Forero, 2001), starting with the implementation of reforms that aimed to do a deconcentration and devolution of the political decision-making process, administrative competences and fiscal capacity from the unitary national government to the 32 departments and 1103 municipalities. Among other factors, this reforms were motivated by the pressure for opening up the political space for political parties apart from the two that had been in power since colonial times, the growing political instability derived from the country-wide proliferation of guerilla movements, the social unrest due to the inequality of access to opportuities between the capital cities and the rest of the territory, the increasing fiscal mismatch between subnational administrations and the national government, and the precarious provision of public services (Willis, Garman and Haggard, 1999).

According to Falleti (2010) the process of decentralization in Colombia was first political starting with the election of local majors and then departamental governors. Then was fiscal with the allocation of resources in the Constitution of 1991, and finally administrative with the designation of responsabilities to municipalities and departments. The consolidation of the decentralization process was recognized as an example in the region for prioritizing the interests of the smallest level of government, the municipalities[2] (Leyva, Pulido and Gomez, 2024). Especifically in the provision of public services, the strongest manifestation of decentralization came through the articles 365, 366 and 367 of the new Constitution (1991), where health, education, environmental health and water and sanitation were defined as "inherent to the objectives of the state" (art. 366).

1.2 The decentralization of WASH

Within this decentralization process, there was a further devolution to the municipalities of the competence to provide WASH services, expecting an improvement on the services based on their better knowledge of local needs and closeness to the citizens. This was not new, but rather responded to existing realities such as the provision of WASH directly by the main cities, present well before the end of the XX century (Torres and Botero, 2005). Elements of decentralization usually associated with neoliberal reforms such as corporatization[3], 'full cost recovery, consumption based billing, volumetric metering, cross-subsidy schemes, service suspension and

[1] In Spanish Sistema General de Participaciones.

[2] If well there are smaller political-administrative divisions such as corregimientos and veredas, as well as other types of territorial entities such as indigenous territories, the municipalities are the smallest political division accountable for the competences given by the central government in each one of its subdivisions.

[3] The application of management principles to public administration, see Furlong (2018).

market based performance evaluation' (Guerrero et al., 2016, p.189) were present as early as the first half of the XX century (Furlong, Acevedo and Patiño, 2018).

The decentralization process also opened the door to other entities different to the municipalities themselves to provide the WASH services. An example is the formal recognition of the diverse communal organizations that were providing the service in rural and peripheral urban areas[4]. However, the decentralization process did not established a unique playing field for all service providers, based on its perception of their different capabilities. It reinforced the participation of private companies under the argument of more efficient service provision through competence, market mechanisms and economies of scale. The municipalities, then, were suggested to delegate the provision of public services to specialized (private) providers, and take charge of the provision only when "technic and economic characteristics […] and general convenience of the service allow and advice" (Constitution of 1991, art. 367).

1.3 The creation of the SGP

The outlook in the provision of public services in the 80s and 90s was characterized by a strong disparity between the urban and rural areas. Specifically for aqueduct, according to the 1985 Census the coverage reached 88.9%, 90%, and 29,5% for the total, urban and rural areas (DANE, 1986), while in 1993 the coverage corresponded to 90%, 96% and 41%[5] in the same areas at the national level (DANE, 1993). In subsequent years, the rate of growth in the coverage would not always keep up with the rhythm of the demographic expansion (Maldonado and Forero, p.24, 2001).

Considering the negative effects that deficient public services were having on the legitimacy of the state, the decentralization process implemented different mechanisms at the administrative, political and fiscal level to improve their provision. Among those mechanisms, the Colombian intergovernmental system of transfers, Sistema General de Participaciones- SGP, was created to serve multiple purposes through the Legislative Act 01 of 2001.

On a practical sense, it replaced the previous transference system, known as Situado Fiscal and marked a distinction between the resources given to departments and municipalities; from a public finance perspective, it aimed to provide more stability to the subnational governments with a pre-stablished source of income, and was thought to help the national government to keep the

[4] Such as associations of users and community associations, in Spanish Asociaciones de usuarios y asociaciones comunitarias

[5] Original value by the author was 73%, but in other sources as Ruiz, Salazar and Gonzalez (2020) for 1993 this indicator was 79.7%, 94.5%, and 41.13% for the total, urban and rural areas, using the same source of information. This last value also goes more in line with the data presented by DNP (n.d.).

subnational units expenses controlled[6]. At the level of public services, the allocations made through the SGP were based on principles of solidarity, complementarity and subsidiarity (Legislative Act 01 of 2001, art.2), and were designed with the objective of providing the necessary resources to fund the services on the charge of departments, districts and municipalities (Legislative Act 01 of 2001, art.2).

Beyond a simple allocation of resources for the provision of public services, the SGP was important because it implied a redistribution of resources from the central to the subnational governments in a context of political instability caused precisely for the excessive centralization of the political power, administrative competences, fiscal and economic capacity. The assignation of the SGP based on formulas with pre-established distribution criteria aimed to free the allocations given to the territorial entities from possible political interferences derived from the centralist model through a more objective assessment of their level of need. In this sense, the Sistema General de Participaciones is considered by the Colombian state as the materialization of the decentralization process, and constitutes one of the main instruments for closing disparities of public services between regions, addressing social gaps and benefiting communities in condition of poverty and vulnerability (MVCT, p.1, 2021).

1.4 Balance of WASH provision 30 years after

After the implementation of the first decentralization reforms introduced by the Constitution of 1991, the Law 142 of 1994, among other decentralization measures, the situation of public services still presents important deficiencies, from which WASH is not the exception (SSPD, p.26, 2024). Considering the data from the most recent census, the coverage in aqueduct in total, urban and rural[7] areas corresponds to 86%, 95% and 51%[8] (DANE, 2018), representing, over a period of 25 years, an increase of only 4pp, 1pp and 10pp respect the census in 1993.

Apart from the very scarce change in coverage, the gap between the urban and the rural areas continues to be critical, with a deeper gap when considering differences between regions. Accouting for the oficial provision of WASH[9] in 2022, the proportion of municipalities with less than 30% in urban and rural coverage is shown on Table 1.

[6] If well later studies would provide evidence that the crisis in which the SGP was established was not caused by the increase of the subnational expenditure (Garcia, n.d.), it was a common reason cited in the moment.
[7] For the 2018 Census, the disaggregated information available for the rural areas (head of municipality and rural spread populations) was grouped under the category "rural" to enable the comparison with precious census.
[8] This percentages similar to the ones presented by Ruiz, Salazar and Gonzalez (2020).
[9] This is, by public entities and private companies formally registered towards the SSPD.

Table 1. Coverage of aqueduct in urban and rural areas in 2022 by region[10].

Region	Urban coverage (%)	Rural coverage (%)
Amazonian	47.5%	7.5%
Andean*	40.86%	2.38%
Caribbean*	25.38%	0.51%
Orinoquia	59.32%	0%[11]
Pacific	21.91%	3.12%

* Andean region includes Bogota, and Caribbean region includes San Andrés, Providencia and Santa Catalina. Source: adapted from the superintendence of residential public services -SSPD (2023).

Additionally, the continuity and quality of those services decrease the actual access in the areas with coverage: 10 of the 32 of the departments present a medium or high risk in que quality of water[12] (INS, p.28, 2023); while at an aggregate level 14.9% of the formal provision of drinking water had a non-satisfactory of insufficient continuity of less than 18 hours a day in 2023 (SSPD, p.28, 2024)[13].

The dissatisfying outcomes in the provision of WASH after the implementation of the decentralization process raises important questions about the factors that limited its potential in the improvement of public service provision across the national territory. A frequently mentioned factor is the insufficiency of the resources to attend to the needs present in the territories (Sanchez, 2006; Ortiz, n.d.). However, if well the resources are indeed limited, a further point signaled by the Decentralization Comission (DNP, 2024) is the misallocation of resources from the SGP, allocating more funds to regions that already count with a high capacity to generate resources, at the expense of the regions with lower economic activities and higher level of needs. Other perspectives (Calderon, 2024; Torres and Botero 2005) suggest that the SGP actually mantains disparities across regions, despite its initial redistributive objectives and design with specific distribution criteria.

1.5 The research question

Considering the context previously mentioned, as well as the fact that the literature has focused mostly on the redistribution and the outcomes of the total system of transfers[14], the current research

[10] To see the full list of departments in every region, see appendix B.
[11] As indicated by the regulatory entity of public services, the data on coverage corresponds to the reports made by territorial entities and is not subject to quality verification procedures. Thus, coverages of 0% have a high chance of being inconsistent (SSPD, p.7, 2024).
[12] Water Quality Risk Index - IRCA defined by the National Health Institute -INS.
[13] This indicator is only partial and corresponds to the biggest municipalities. Not all of the territorial entities report their information.
[14] The two biggest SGP categories.

aimed to explore the role of the SGP in the redistribution of resources for WASH. For this, two sub questions were also addressed:

- Does the resource allocation correspond to differences in terms of capacity of the regions to generate income, the level of expenditure required and the cost-of-service provision?
- Is the allocation of resources favoring the Andean region, either in the total or the criterion-specific transferences?

To address these important questions, the present research departed from understanding the profile of the regions and categories of municipalities[15] in three main: their capacity to generate income, the level of expenditure and the fees to the final users in the service of aqueduct. Then, it contrasted the allocations made by the distribution criteria with sectorial indicators to understand how the WASH SGP was distributing resources between regions and categories of municipalities.

Within the main results, it was found that the established system of WASH SGP worked as an important mechanism for the distribution of resources between national and subnational governments, doing an allocation of resources that corresponded on average terms to the performance of municipalities in the biggest categories with the distribution criteria. However, the aim to achieve multiple objectives at the same time, the narrow establishment of service standards, and allocations that were inconsistent with the performance of the distribution criteria, were found to be important obstacles in the redistributive potential of the WASH SGP. Particularly, the allocations privileging the Andean region were concentrated in the municipality category 6, distributing less resources to Orinoquia, Caribbean and Pacific in the different distribution criteria.

The rest of the document is organized in the following way: chapter 2 sets the rest of the historical background necessary to understand the particularities of the provision of WASH in the Colombian context; chapter 3 presents the literature review and the analytical framework; chapter 4 dives into the methodology, data and results; chapter 5 takes the main results and discuss them in relation to the referenced literature; and chapter 6 concludes the document and provides suggestions for further research.

[15] To see the criteria that define the categories of municipalities, see Appendix A.

2. Historical context and generalities of the SGP allocation for WASH

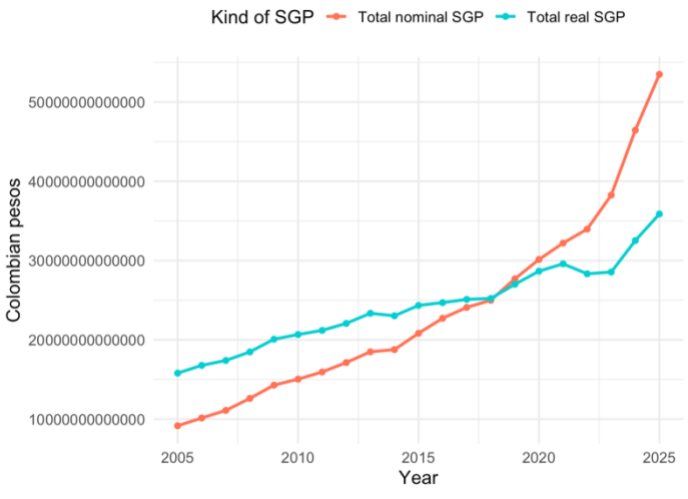
2.1 The general stunting of the SGP

A constant that will be present all along the process of decentralization is the insufficiency of the magnitude of the resources to attend the sector. With the Constitution of 1991, a significant allocation of resources had been assigned to municipalities and departments, considering all the competences transferred to them. Initially, it had assigned as much as 46,5% of the national current revenue -ICN[16] in 1991 (Ortiz, n.d.) to departments and municipalities, but the 2001 and 2007 reforms severely limited this initial trend. As it can be seen in the Figure 2, the SGP in real terms has not grown more than 40% over the last 20 years.

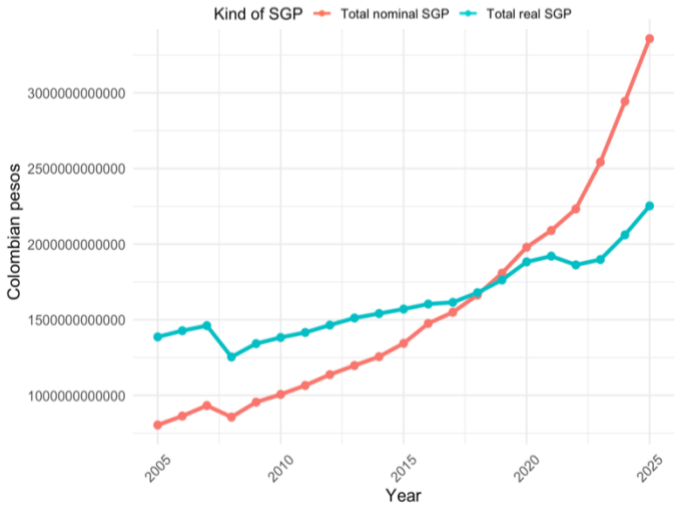
The establishment of WASH as an independent category through the SGP 2007 reform (Law 1176 of 2007) was a budgetary prioritization from the central government responding to the deficient coverage and quality in the sector. Before the reform, the municipalities were supposed to allocate for WASH 41% of the resources from the category of general purpose. However, the execution of those resources was discretionary to the territorial entity, and in some cases were used for other purposes. After 2007, the resources in this category from the central government were exclusive for WASH and demanded a counterpart from the municipality in terms of responsabilities, monitoring and reporting. In the Panel B of Figure 1 it is possible to observe that the allocation for WASH in the last 20 years has grown only 52%.

Figure 1. Real and nominal SGP 2005-2025 in total and for WASH.

Panel A. Total SGP



Panel B. SGP for WASH



Source: adapted from DNP (n.d. -b).

[16] Ingreso Corriente de la Nación in Spanish.

Part of the relevance of the SGP is related to the uses[17] it has. Apart from its fundamental role to fund the subsidy scheme, it is also used for strategic investments to increase coverage and/or quality of the services through pre-investment in design, studies and project consultancies, strengthening of administrative and operational aqueduct systems, optimization and improvement of aqueduct systems, macro and micro measurement, reduction of wasted water in the distribution process, and acquisition of equipment for the operation of WASH systems (Law 1176 of 2007, art. 11). The other administrative and operative costs (for example, salaries of the employees) are expected to be covered via the fee paid by final users, according to the tariff methodology established by the CRA.

Now, over the 2012-2018 period, the SGP represented in average 47% of the total sources of funding for WASH expenses, while the own resources of the municipality represented an average of 17% during 2012-2018 (Ruiz, Salazar and Gomez, p.37, 2020). Consequently, the SGP is the most important source of funding for this sector, apart from other minor sources of financing for WASH as the regional investment funds, territorial pacts, the royalty system (SGR[18]), international cooperation, multilateral credits, and own-revenue municipality taxes.

2.2 Distribution criteria

Since 2007, the distribution of the total SGP[19] corresponds in 58.5% to education, 25.4% to health, 11.6% to general purpose, 5.4% to WASH, and the outstanding 4% is used for other special assignations[20]. In the category of WASH, 15% of goes directly for departments[21] and the capital district of Bogota, while the other 85% is distributed between municipalities according to their performance in the distribution criteria.

[17] Fort he full listo f uses, see Appendix C.
[18] In Spanish: Sistema General de Regalías.
[19] With the previous reservation of 4% of the total resources to the categories of: 0,52%, indigenous territories; 0,08%, riverine municipalities along the Rio Grande Magdalena; 0,5%, programs of school nutrition; and 2,9%, national pension fund of the territorial entities (Art. 2, Law 715 of 2001).
[20] Such as education and integral attention to kids between 0-5 years.
[21] The role of departments in the provision of WASH is contested (see FND, 2024), but the current document will focus only on the provision made by municipalities.

Those criteria departed from the earlier distribution criteria in the General Purpose category of the Law 715 of 2001, and did numerous adaptations specifically for WASH. It dissagregated the population category between those who are currently covered and the deficit in coverage, diminished the weight assigned to poverty, and also diminished the importance of administrative and fiscal efficiency. The resulting distribution criteria are as shown on Table 2.

Table 2. Distribution criteria in the categories of general purpose and WASH.

General purpose - 2001	**DWBS - 2007**
Multidimensional poverty – NBI (40%)	Level of poverty (20%)
Share of the national urban and rural population, including displaced population - (40%)	Deficit in coverage (35%)
Fiscal efficiency - (10%)	Achievement of fiscal and administrative efficiency (10%)
Administrative efficiency - (10%)	Effort of the territorial entity to increase coverage (5%)
-	Population currently covered and balance of the system of subsidies[22] (30%)

Source: adapted from Law 715 of 2001 and Law 1176 of 2007. In parenthesis the ponderation of the criteria.

Over time, regulatory entities have specified the definitions and ponderations of the distribution criteria and have established an elaborated system of mandatory monitoring through indicators, centralized forms and platforms such as the FUT and the SUI[23]. In the period between 2007-2022[24], the data reported in those platforms is used for the calculation of synthethic indicators that later orientate the allocation process of the fiscal and administrative distribution criteria. This

[22] Also called solidarity scheme

[23] Formulario Unico Territorial- FUT, where the territorial entities upload all the public financial information regarding revenues and expenses, and Sistema Único de Información- SUI, where the providers of the services report the information regarding coverage, quality and administrative aspects of their provision to the SSPD.

[24] From 2022 onwards, the distribution criteria have been the same.

monitoring system through the FUT and the SUI had the purpose of providing incentives to the municipalities so that they would provide more results with the distributed inputs (MVCT, 2021). Part of the importance of those systems of monitoring and reporting come from the fact that with the decentralization process in the 90s, the role of national government shifted from being a direct provider to a regulator in terms of the 'coverage, quality, financing … and tariff structure' (Constitution of 1991, art. 367) of the different providers and municipalities. The municipalities, nevertheless, conserved the accountability for its citizens' access to WASH services, even if the provision of the service was being done by different providers.

Nevertheless, those systems of incentives and monitoring have been criticized because of their complexity (DNP, n.d. -d; Moreno Mendez, 2020). In fact, the adequation of the monitoring and reporting system for the big, small and rural providers of the WASH services is recognized as one of the main challenges of the sector (SSPD, 2024). Also, they have been criticized because of what they impose as the "correct model" of service provision. According to the Decentralization Comission (DNP, 2024a), they privilege characteristics that are present in Andean cities that concentrate population and economic development (DNP, 2024a), while ignoring and penalizing local realities of other areas of the territory (Bonet, Perez and Ayala, 2014). As a result, it is allegued that regions that already count with economic resources receive more transfers from the national government than other areas that don't count with enough economic activity to sustain the provision of services on their territories (Torres and Botero, 2005; DNP, 2024a).

2.3 Institutional channels of resource allocation: the certification process

An example of the imposition of a uniform service provision was made with the Decree 1477 of 2009, where the Regulatory Office of Public Services- SSPD was given the authority to "certify" every year the municipalities that complied certain requirements in administrative records. In case a municipality did not comply with the requisites, the resources from the SGP and the competence to provide WASH were removed from the municipality and instead given to the department. The "Certification" of municipalities was discontinued in 2019 (SSPD, n.d.), which means that all municipalities have the competence and the SGP resources to provide the service. This certification process was later criticized for penalizing, instead of bringing capacitation to the municipalities (DNP, 2024a). Additionally, posterior studies showed that there were no service

output differences in WASH between the certified and not certified municipalities (Bonet, Perez and Ayala (2014); DNP, n.d. -d).

3. Literature review and analytical framework

3.1 Fiscal federalism and horizontal equalization

Nested on decentralization processes, intergovernmental mechanisms of resource redistribution have been traditionally supported by arguments of economic efficiency. One of the arguments of this kind was proposed in the so-called first-generation federalism, departing from the recognition that subnational government units present an underlying heterogeneity between their expenditure level, income-generating economic activities, and capacity to raise tributary revenue. While some subnational units count with a strong tributary base to collect taxes and fund the expenses associated with public service provision in their own territories, some don't have enough resources to spend and provide a minimum standard of services. As a result, apart from a difference in the level of service provision, the units present a difference in the level of taxation applied to citizens across regions.

In this sense, authors such as Oates (1972) propose that an intergovernmental system of transfers would be in the capacity to redistribute and partially compensate for the lack of resources across government units inside of the same category to provide minimum service standard to its citizens with a similar level of tributary impositions. From his perspective, the main objective of the intergovernmental system of transfers was to facilitate a minimal level of local service provision, instead of reaching a complete equalization of the level of income between the subnational units. Full horizontal equalization would be considered as unreachable in the presence of underlying income generation inequalities across units of government

A uniform provision of public services across units of government in the same category and under similar conditions of fiscal imposition would prevent the migration of capital, economic resources and people because of poor service provision and excessive tributary loads. This is considered efficient in the sense that areas with good standards of service provision are not overloaded, and the regions are able to keep their tributary base. Additionally, one of the main foundational ideas from fiscal federalism would suggest that the local knowledge of subnational governments on resources, needs and preferences of citizens in their area enables them to do a more efficient service provision than what the national government could do.

Continuing with Oates (1999), another reason for implementing an intergovernmental system of transfers is to provide subnational units with the necessary incentives to promote or correct their performance in the provision of public services. Under this logic, the units that provide high coverage and high-quality services are incentivized to continue their provision with high allocations that compensate the positive spillovers that those units are having on their neighbours. To give a similar allocation to units with high and deficient service provision would be seen as an incentive for low-performance units to continue underperforming and rely on the spillovers of the high performing units. Consequently, the most efficient allocation for underperforming units will be low and tied to their performance.

3.2 Kinds of intergovernmental grants systems

The particular structure of conditionalities and funds of an intergovernmental grant system reflects the objectives of the state and determines its redistributive effects. A first classification can be made based on their degree of conditionality. Unconditional grants are the most direct way for levelling the differences in revenue capacity among subnational units. While the full autonomy that they conceive to the receptor can be seen as a strength to tailor the provision of services in their area, it can also be seen by the national government as a threat to its control and a potential source of resource deviation. On the other hand, conditional grants allocate resources only for the provision of particular services under pre-stablished standards. If well it is a common kind of grant, it can become problematic as it requires the compliance of local governments with standards designed by the central authorities that usually distant from local realities, as well the spending in areas that do not necessarily correspond to local priorities.

A second classification corresponds to the amount allocated by the grant. Ideally, open-ended grants would be the best mechanism to fund the provision of social services, as they don't present limits to the amount to be financed. One of the main limitations of this grant is that it only increases the available budget for spending but does not guarantee that the local government will have more incentives to spend in a particular sector (Oates,1972). On the other hand, their viability decreases when considering budgetary limitations.

Matching grants, on their side, fund only a percentage from the total provision cost. In theory, this kind of grant is the most efficient way to incentivize the provision of a public good by the local government, because it not only increases the available budget of recipients, but also lowers the cost of opportunity and incentivizes the provision of particular services. From the perspective of the central government, the advantages of this kind of grants lie in that they incentivise local governments to continue strengthening their own sources of revenue and allow the central government to have an influence on the amounts and categories spent by local governments, while taking advantage of efficiency gains in local provision (Bird, 1983).

The final redistributive effects of a grant system will depend both on its characteristics and the socio-economic context where it is implanted (Faguet, 2008): small redistributive effects will be more significant if the preexisting socioeconomic structures present a higher degree of inequality. Those pre-existing conditions must be considered on the election of the transfer system (either unconditional, conditional, open ended, or matching) and the adoption of the distribution criteria under which the allocation of resources will be done.

3.3 Formula of distribution for conditioned intergovernmental grants

The implementation of a formula or scoring system is a common standard used to rank the subnational governments eligible for the grant and allocate the resources considering the objectives and values of the state, the current outlook in the targeted services at the national level, and the characteristics of the different subnational units. The main objectives of using such formula are to avoid 'political interferences' in the process of resource allocation, diminish the propensity to corruption, and do more accurate 'needs assessments' between the subnational governments. The formula should be as simple as possible (Brosio, 2014), and depending on the objectives of the

state, it can use distribution criteria based on indicators of equity, efficiency, and sectorial performance.

As an illustration, if the objective of the state is to equalize the resources available between regions, the allocations will consider distribution criteria such as the tributary income per capita, to rank subnational units according to their capacity to generate revenue. If the main objective is to homogenize the level of spending across regions, then the distribution criteria will evaluate the differences in indicators such as the per capita social expenditure. When the objective is rather to incentivize a particular behaviour in the provision of services, the distribution criteria will then consider aspects such as the compliance with sectorial standards (like reporting of information) and the achievement of goals in coverage and quality, among others. The subnational units that present the best sectorial performance, this is, the units where the service is provided in the most 'efficient' way will receive the biggest allocations.

3.4 Multiple meanings of efficiency and equity in WASH

At this point, it is necessary to consider a brief overview of the multiple meanings that efficiency and equity can have in the context of resource redistribution for public service provision. On the side of efficiency in the context of public resource distribution and provision of services, it is necessary to take a step away from the traditional concept of an equilibrium where it is not possible to increase the welfare of a unit of government without decreasing the welfare of another one (Pareto Equilibrium). Necessarily, allocating more resources for a unit of government means allocating less to another one (Musgrave and Musgrave, 1959, p.74,), which affects the final level of service provision. As mentioned by Singh (2006), the existence of a budget constraint limits the outreach of WASH projects, and necessarily implies a trade-off between increasing the technology or quality in areas that already count with coverage, or increase coverage in non-covered areas with a more basic level of technology or quality.

Practically speaking, in service provision efficiency can be understood as the relationship between the output obtained in a particular service and the input that it received (Savas, 1978): the areas that produce more output with least units of input are considered as more efficient. Particularly in WASH, the economies of scale and the high initial costs will generally make investment in areas with pre-existing coverage more efficient than in areas with none or very low levels of coverage. This effect is even stronger when considering the "natural monopoly" of the sector, confirmed for the Colombian case by Nauges and van der Berg (2007).

The costs of operation, administration and investment[25] of WASH are heavily influenced by the geographical location of the provision. This is particularly relevant in Colombia, where the diversity of ecosystems translates into a great heterogeneity of the environmental conditions where the service is provided. Factors related to the physical environment such as the required treatment

[25] Not in the scope of this document, but it is worth mentioning that the debate on cost recovery in WASH has been present since early implementations (Furlong et al., 2018) until recent debates about the financial viability, coverage and quality of the service (MVCT, 2025).

for water potabilization and the 'natural'[26] availability of water are intersected with past provision outcomes in terms of the availability (or absence) of previous infrastructure and the required level of technology, among others. Those characteristics of the subnational units determine both the present level of coverage and quality of the services, and the magnitude of choices for future provision.

Now, looking for a standard of what can be considered as a fair result of distribution, the state will define its conception of equity and will implement different channels to achieve it. Among the 4 equity alternatives offered by Musgrave and Musgrave (p. 76,1959) the utilitarian, (maximizing total or average welfare) and egalitarian (where the welfare of all is equalized or the welfare of the lowest group is maximized), options are preferred on the approaches of fiscal federalism and distribution of public resources.

Particularly, the achievement of the egalitarian alternative has been operationalized in a broad range of options. A first option can be the horizontal equalization in terms of income, taking as a representative measure the per capita tributary income. A second option can rather focus on the equalization of the social expenditure per capita, aiming to have a direct effect on the equalization of the level of expenditure itself, and an indirect effect on the equalization of the level of service provision. A third option is explained by del Rio (1981, p.87), contrasting the value perceived by the individual from the provision of the service and the contributions made for it.

3.5 Application to the Colombian WASH SGP case

The intergovernmental system of transfers in Colombia can be understood as a financial instrument operating within a complex institutional framework. If well responding to multiple motivations, its objectives can be understood as to (Bird, 1983, p. 467):

1. 'Reduce inherent fiscal imbalance between levels of government
2. Provide some degree of fiscal equalization among jurisdictions
3. Ensure the provision of minimal levels of certain public services'

Since the constitution of WASH as an independent category of the SGP in 2007, it can be labelled as a conditional matching grant, with the objectives of (DNP, 2016, p.14):

1- 'Promote the fastest universal coverage of WASH services.
2- Ensure an efficient resource execution through the establishment of incentives that reward the areas with increase of coverage and quality.
3- Ease the articulation with sectorial policy'.

3.6 Regional gaps and redistribution in the Colombian context

The importance of the redistributive potential of the SGP is nested on the political and social processes that gave way to the decentralization process in Colombia. Gonzalez and Espinosa (n.d.) highlight that the social exclusion induced by the lack of access to basic public services can hinder

[26] Terms such as "natural availability/natural supply" of water are not preferred because as shown by (Arango et al., 2025) political and economic dynamics across regions play a fundamental role in determining the water available in the physical environment.

the legitimacy of the state, enhance political instability, foster the sub utilization of economic resources, and induce migration. Those effects, among other circumstances mentioned on section, 1 motivated the decentralization process to give a first step towards closing the multiple gaps existing between regions.

While Latin America is the second most unequal region following Middle East and North Africa, Colombia is the most unequal country in the region considering the post-tax wealth concentration: the top 1% concentrates 16% of the wealth, while the top 10% concentrates 57% (World Inequality Database, 2024). If well there are many reasons behind this concentration of wealth, it can be related to the historical concentration of economic activity in areas close to the central parts of the country, and the lag of the economic production in other areas as Caribbean and Pacific (Han-de-Castro and Meisel-Roca, 2018).

This concentration is reflected in the great heterogeneity that exists between the different regions in terms of generation of income, savings, and spending. Following Bonet-Morón, Pérez-Valbuena, and Montero-Mestre (2018) after the establishment of the SGP in 2001, Caribbean and Pacific are the regions with the lowest capacity to generate income and savings. They also finance the highest proportion of their investment with the transferences[27] received: in 2015, the municipalities of those regions had on average a dependency of the system of transfers of 60%. The municipalities located in Oriental, Central and New departments[28] had an average dependency of 45%, whilst the capital presented a dependency of 20%. A second reflection of this concentration is on the level of poverty, another dimension with a persistent and spatial character on the 'periphery': by the regions of Caribbean, Pacific, as well as most of the departments in the Orinoquia and Amazonia region (Galvis and Meisel, 2010[29]). This poverty is multidimensional, and includes the deficient coverage and quality of WASH services across regions, as described on section 1.

That important gaps in access to drinking water and basic sanitation persist along time on the same regions in Colombia does not rest importance to the fact that it is a matter of structural social exclusion that must not be normalized. Access to WASH is an enabler for all human capabilities, as it is correlated with diminishing exposure to gastrointestinal diseases in adults (Carvajal-Restrepo et al., 2019); educational attainment in adults (Florez-García et al., 2025); and economic growth and human development (Amorocho-Daza, van der Zaag, and Sušnik, 2023), among other capabilities. If well the resilience of the people must be recognized in the alternative ways of self-provision apart from the "formal" state supply, those alternative systems come oftentimes with additional costs in terms of time, money, health, and restrictions on the capabilities of their day-to-day life.

Among the implications brought by the constitution of Colombia as a 'social rule of law'[30] (art.1), the equal status of all people in terms of rights, freedoms and opportunities means that the state would promote the conditions to materialize the equality and to protect marginalized or

[27] Not only the SGP, but also the royalties from the extraction of natural resources and other smaller transferences.
[28] This regionalization corresponds approximately to the regions of Orinoquia and Amazonian.
[29] Note that this reference corresponds to 2010.
[30] Estado social de derecho in Spanish.

discriminated groups (Political Constitution, art. 13, 2001). Nevertheless, the persistence of low quality and coverage leaves an open question about the efficiency of the diverse policies that have been designed over the years to address this issue. It also places a question on the degree of effort and intention that has been actually put in place by the state to achieve the objectives of its own Constitution.

3.7 Revision of previous evaluations to the SGP

Early evaluations to the SGP were made by the Colombian National Planning Office -DNP, one of the most relevant executive entities throughout the process of decentralization and resource allocation. What results interesting is that important flaws of the just constituted SGP signaled in Maldonado and Forero (2001) have also been signaled in recent years by other authors, such as Kalmanovitz (2024): the multiplicity of objectives with a single transference, fixed allocation percentages, an excess of conditionalities over the resources allocated and the lack of coordination with other financing instruments.

While important reforms have been made to the distribution criteria of the SGP and have addressed other observations made by Maldonado and Forero (2001) regarding the equity of the allocations such as the predominance of population and poverty as a distribution criterion, others regarding the efficiency of the system have remained mostly unaddressed. Among these are the small preponderation of fiscal and administrative efficiency criteria and the tenuous consideration of the costs of provision. From this perspective, the system is losing efficiency in two main ways: first, it is not giving enough incentives to the municipalities with a good performance. Secondly, it is allocating a similar number of resources to areas with very different provision costs, leaving the areas with high costs at the expense of their own capacity to generate resources. This is particularly important when considering the concentration of economic activity and poverty across the national territory, and the heterogeneous conditions faced by service providers in each one of the regions.

Regarding the achievement of the decentralization process objectives, it can be said that the SGP has partially achieved its objective of doing a horizontal equalization between municipalities. While authors as Calderon (2024), Torres and Botero (2005) would suggest that the WASH SGP kept the disparities between the regions allocating more resources to areas with high coverage, authors as Bonet-Morón and Ayala-García (2015) have found a positive redistributive effect of the transferences done in the equalization of the per capita income level in municipalities and departments. Accounting for this variable, the SGP had a progressive component that served to decrease the gap through a higher allocation to the smaller municipalities. Additionally, it exhibited a positive relationship with the aggregate level of poverty (Bonet, Pérez, and Ayala, 2014). However, when considering the allocation made only by the poverty criterion, the relationship between the SGP and the poverty level was either neutral or negative.

Nevertheless, in line with Maldonado and Forero (2001) the equal level of responsibility in service provision across municipalities despite the disparity on their expenditure needs has been recognized as an important limitation in the redistributive capacity of the system (Bonet, (2006) and Bonet-Morón and Ayala-García (2015)). For all the categories covered by the SGP, the closest criterion to approximate the level of per capita municipal expenditure is the level of poverty. Appart from it, in the WASH category the deficit in coverage “considering the differences in the

cost of provision of the service"[31] is the only criterion that accounts for the costs of service provision (Resolution 0573 of 2022).

A more critical view of the performance of the SGP and the decentralization process has been presented by the Decentralization Commission (DNP, 2024 and 2024a). A first point can be made on the insufficiency of the total SGP resources after the continuous reforms made after 2001, which generated a stunting of the resources and limited the capacity of the system to provide a robust financial support in the provision of social services across different areas in the country. The second most prominent point is regarding the expectations in the redistributive potential of the SGP. In simple terms, considering the initial design and objectives of the decentralization process, it was expected that the system of transfers would have done a redistribution from the areas that concentrate more economic activity to the ones with prevalence of environmental areas, ethnic groups, rural populations, PDET[32], and non-municipalized[33] areas[34].

Nevertheless, the Decentralization Commission highlights that an existent bias towards the regions that concentrate economic activity, and prominently, the Andean region, prevents the potential of the public spending to reverse power asymmetries and promote the universalization of services (2024). This bias would be present not only in the quantity of resources assigned, but also on the establishment of distribution criteria and a model of service provision based on the institutional, social and ecological context of the Andean region. This not only ignores the diversity of the regions, but also penalizes them with a heavy system of monitoring and reporting, less resources, and more conditionalities from the central government.

Departing from this bias, the proposals of the Decentralization Commission (DNP, 2024a) for the redistribution criteria of the SGP general purpose category[35]are: first, to raise the base amount and reinstitute its relationship with the national current revenue to ensure a major availability of resources. Second, to increase the allocations of this category without conditionalities; third, to create two separate bags for the allocation of resources: a sectorial one, to attend the specific service of the allocation, and a regional one to recognize the particular characteristics of the regions. The fourth proposal, innovative in its kind, suggests three new distribution criteria: fiscal equalization, measured as the inverse of the per capita tributary income[36], with a 70% of the total ponderation; the ethnic prevalence of the population according to the new territorial typology proposed, or a minimum of 30% of the population from ethnic groups, with a ponderation of 18%; and the prevalence of environmental areas and ecosystems, with a ponderation of 12%.

[31] This is what is stated in the Resolution 0573 of 2022. On previous regulations as Law 1176 of 2007 it was stated as "Decifiency in coverage- for which it **might** be considered the differential of service provision costs" (emphasis by the authos).
[32] Programas de Desarrollo con Enfoque Territorial (Development programs with territorial emphasis).
[33] Populated areas that are not under the territory of any municipality, and that are outside of the legal requirements of population and income to be classified as a municipality (Sentency C-042/22).
[34] The typology of the regions used by the DNP is different from the classification in "natural" regions. The last regions mentioned have an approximate correpondence with Orinoquia, Amazonian, Caribbean and Pacifico, with the exception of their main cities.
[35] In the SGP the smallest category, the Transferences of Free Destination (Transferencias de libre destinación).
[36] As a proxy of the potential tributary income per capita.

4. Methodology, data and results

4.1. Description of the proposed methodology

The role of the SGP on the redistribution of resources for WASH is explored through a comparison of the allocation between regions and categories of municipalities[37] in two stages. The variables used were defined considering the literature and previous evaluations done to the SGP by authors such as Maldonado and Forero (2001), Bonet-Moron and Ayala-García (2015), as well as the proposals made by the decentralization commission (DNP, 2024).

On a first instance, the profile of the different regions and municipality category will be contrasted with the SGP allocations to understand how responsive the distributions are with regards to three variables: first, the per capita tax capacity[38]. Second, the level of poverty by total and by the component of services, as an approximation to the level of expenditure required by the municipality for the provision of services. Finally, the costs of provision, considering the two main components of the aqueduct tariff structure, differentiated by strata, municipal category and region. On a second stage, after establishing the profile of the regions and categories of municipalities, the presence of a bias towards Andean and the municipalities of category Especial, 1 and 2 is evaluated contrasting the total and criteria-specific SGP WASH allocation between regions and categories of municipalities.

4.2 Limitations and boundaries of research

Given the exploratory character of the research, the present document is limited to evaluate the allocations of the SGP with respect to the proposed variables in a given year. Because of the predominant use of graphs and tables instead of a statistical analysis, it is not possible to establish causal relationships. Another limitation is regarding the temporal dimension, as the analysis is mainly focused on the last year with available information. On the other hand, the focus is on the allocations made to the Andean region and the category 6 of municipalities, but more nuanced disparities between the regions are not detailed.

An important limitation is regarding the absence of the per capita WASH municipality spending as a variable for evaluating the equalization done by the SGP, as suggested by the literature. If well the data of current, operating and investment expenses was available, those variables could not represent a proxy of the amount that is spent by the municipality (or the private provider) in public services. The two closest variables were operating and investment expenses. For the operating expenses, if well it provides a magnitude of how much the municipality spends on the development of its competences as public management and direct provision of public services, it was discarded because only a reduced number of municipalities concentrated on few departments are direct providers of the services (MVCT, 2025). The investment expenses were the best option, as they partially reflect the public services' system of subsidies and investments. However, given the autonomous budget management of each municipality it was not possible to distinguish between

[37] The maximum level of information disaggregation is at the municipal level.

[38] If well there is not a direct correspondence between the per capita tax capacity and the resources available for WASH at the municipal level, it is the closest proxy to the dimension of the autonomous resources that the municipality can generate to fund the different services provided.

the different sources of funding (system of transfers- SGP, system of royalties- SGR, other transferences and sources of income) to differentiate the level of spending before and after transferences.

Not all the variables were available at the municipal level for all the years, despite the broad catalogue of open data relevant for the present research. Finally, the reporting and monitoring SGP WASH systems are not adequate for the smallest providers and municipalities, especially categories 5 and 6, neither for the municipalities with a high prevalence of rural areas. Consequently, data might be more representative of urban concentrations.

4.2.1 Positionality statement

Coming from a capital city and a family that wouldn't know what water scarcity was until 24 years later, in an incident that was wrongly called "natural" by those who blamed the environment for their own negligence, the study of why some regions have access to water while others don't was a personal imperative. However, I am still unpacking bias of my own upbringing, and looking for ways to, with my work, go beyond the understanding of water in narrow terms as a public service, and the normalization of the lack of access to WASH as a characteristic feature of "the other" areas apart from Bogota.

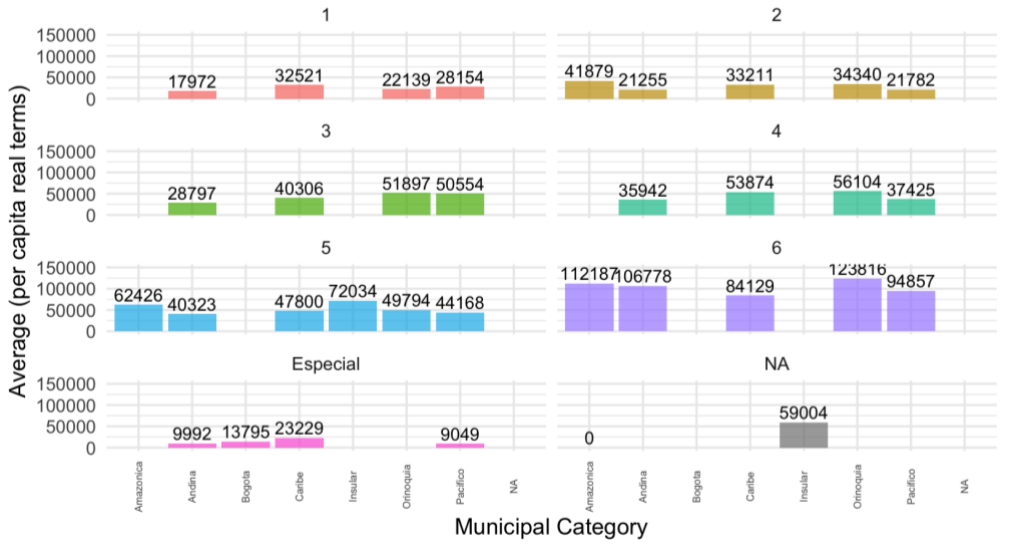
4.3 Data

4.3.1 Total allocation of the WASH SGP

The analysis of the municipal WASH SGP allocation by total and by the distribution criteria is done with the most recent data available on the SICODIS system provided by the DNP in the period between 2005-2024, and the yearly CONPES distribution documents from 2011 to 2024. This and all other monetary variables were transformed from nominal to real terms using the Consumer Price Index (CRA, 2025), and changed to per capita terms with the population of every municipality, unless other units are specified.

The total allocation by municipality was made distributing more resources to the smallest municipalities across all the regions, as it can be seen on Figure 2. The only exception is on the Caribbean region, where category 5 received less than category 4 in 2024.

Figure 2. Average WASH SGP allocation by category of municipality across regions, 2024.



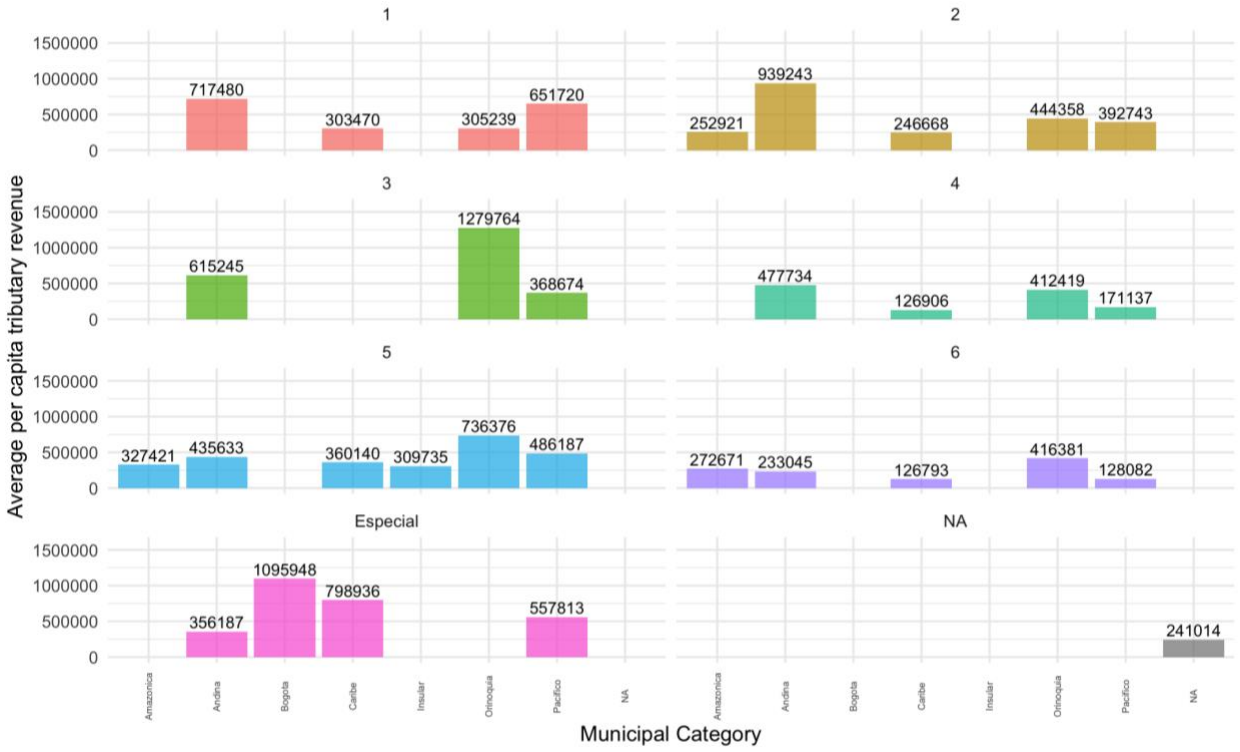
Adapted from: SICODIS -DNP (n.d. -b).

The Andean region received the least allocation in all municipality categories, with exception of category 6, where it received more than Caribbean and Pacific.

4.3.2 Per capita tax capacity

The lack of a clear pattern in the per capita fiscal capacity is evident when considering the great disparity across categories and regions. In categories Especial, 1 and 2 the revenue generation capability is slightly higher than in the other categories, but this difference is not significant and is even smaller when taking out the Andean region. This last one presents the highest per capita fiscal capacity in categories 1,2,3 and 4. In category 5 it is higher than Caribbean, Amazonia and Insular, while in category 6 it is higher than in Caribbean and Pacific. It is only possible to say that the category 6 is the one with the smallest indicator, across all regions, except for Orinoquia.

Figure 3. Municipality average per capita tributary revenue in 2018, by category of municipality and region.



Adapted from: DNP (n.d. -c).

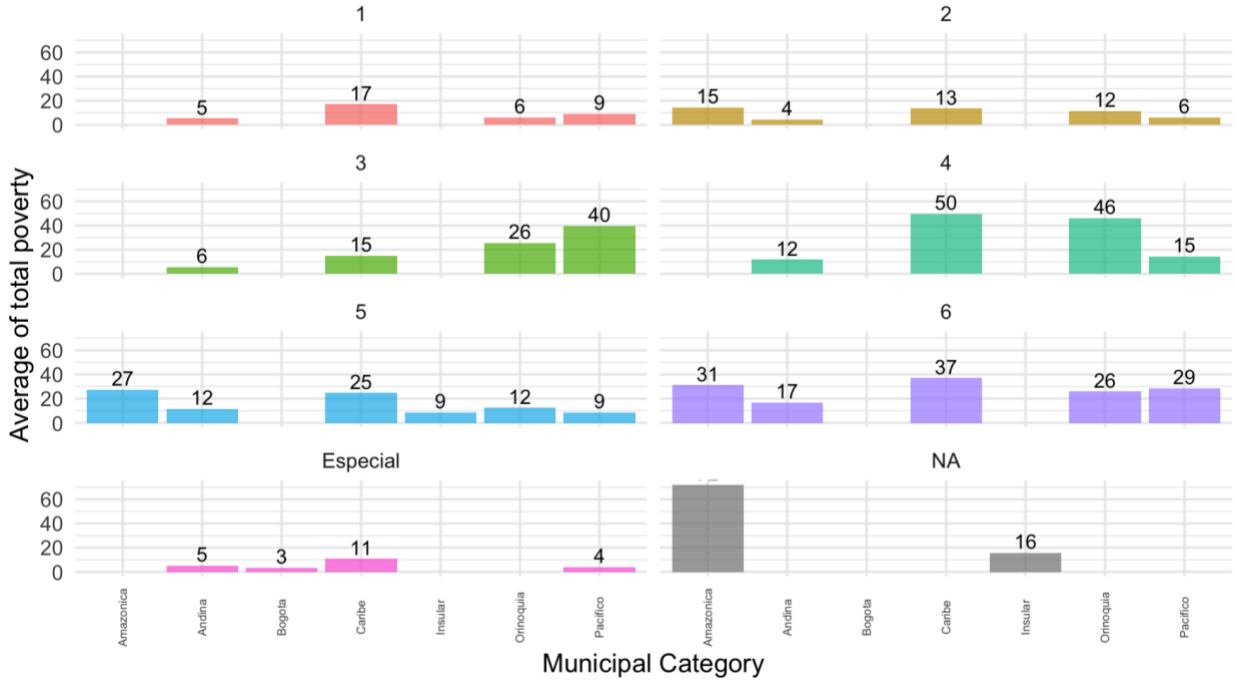
Contrasting the total SGP WASH allocation with the per capita tax capacity, in category 1 the allocation of WASH SGP is bigger for municipalities that have a minor per capita tributary revenue. In category 2-6, the Orinoquia region receives a higher allocation of WASH SGP than Caribbean and Pacific, even though it presents a higher per capita fiscal capacity[39]. In category 4, Andean receives a similar amount to Pacific, even though it has a tributary capacity approximately 2,7 times higher. In category 6, even though Andean has a tributary capacity approximately twice as much as Caribbean and Pacific, it receives 20% and 11% more, correspondingly, of the total WASH SGP. In summary, if well the system makes some allocations according to the per capita fiscal capacity of the municipalities, the correspondence is not exact and makes important mismatches allocating more to the Andean region in categories 4 and 6 with respect to Caribbean and Pacific.

4.3.3 Multidimensional poverty, total and by component of services

If well all categories present a significant level of poverty, a higher prevalence can be observed in categories 4, 5 and 6. Across all categories, the Andean region maintains a poverty level below 20% and presents the lowest indicator across all categories(with exception of Especial). Caribbean presents the highest level of poverty in categories Especial, 1, 4 and 6, while Amazonia is the highest on categories 2 and 4, and Pacific is the highest on category 3.

[39] The higher indicators for the Orinoquia region, that in some cases is even bigger than Andean, could be explained by the concentration of fossil fuel extraction centres in the department of Meta, as well as the accelerated economic growth that it has presented on recent years (Kalmanovitz, 2024).

Figure 4. Average of municipal multidimensional poverty 2018.



Adapted from: DANE (2022). Note: that Pacific in category Especial has a poverty of only 4 % seems as inconsistent data.

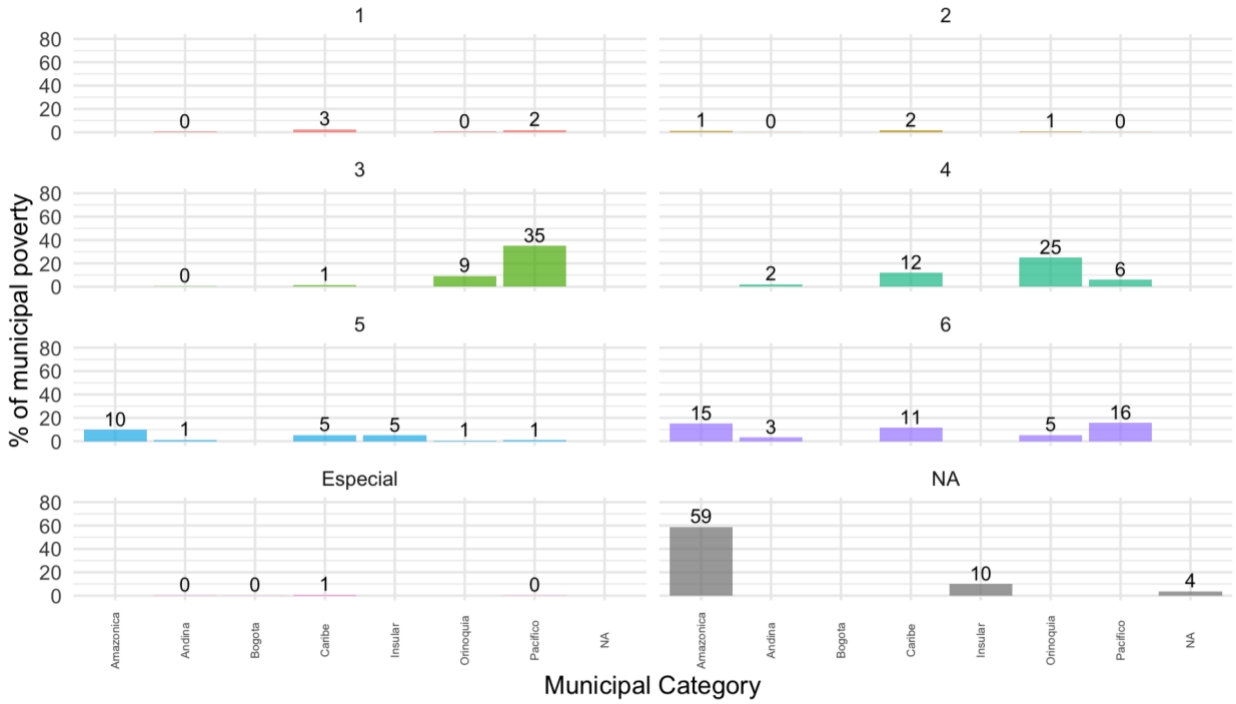
The WASH SGP allocates more to the regions that present a higher level of poverty in Categories 1,2 and 4. In category 3, it gives a similar amount to Orinoquia and Pacific, even though the latter presents a significantly higher level of poverty. In category 5 there is a higher allocation to Insular than other areas that present a higher indicator, as Amazonia, Caribbean and Orinoquia[40]. In category 6, Andean receives a similar amount to Amazonia, and more than Caribbean and Pacific even when their levels of poverty are higher. In category Especial, Andean receives more than Pacific.

4.3.5 Poverty by services

The poverty by services counts by municipality the number of households that lack access to WASH. At the total level, it is the least prevalent in categories of municipalities Especial, 1 and 2, while it is more prominent without a clear pattern between categories 3,4,5 and 6. It is notorious the smallest scale of the level of poverty by services registered by the Andean region in all categories of municipalities.

Figure 5. Average of municipal poverty by component of services 2018

[40] However, this might be understandable given the fact that Insular receives resources for all the territory of the island under the classification of a single municipal category.



Adapted from: DANE (2022).

The similar levels of poverty by services in categories Especial, 1 and 2 does not allow to make a contrast with the WASH SGP allocation. In the case of categories 3 and 4, the regions that present a higher level of poverty in services are corresponded with a higher allocation of resources. On category 5, although the Caribbean region has a similar level of poverty than Insular, it receives 34% less. In category 6, the Andean region presents the smallest level of poverty, but receives a similar amount to Amazonian and significantly more than Caribbean and Pacific.

4.3.6 Tariff structure

To understand the distribution of the costs to the final users in different regions and municipal categories of Colombia, the tariff structure reported by the aqueduct[41] providers was taken in two separated periods, 2010 and 2018[42]. A unified fee per strata in the four tariff components was obtained for every municipality averaging the tariffs from different providers. Then, the fees were averaged across municipalities in the same category, keeping the distinction by strata. In this way, it is possible to do a comparison between the fees paid by an average' user in a particular strata between different categories of municipalities and regions.

Following the tariff methodology stablished by the CRA, the different WASH providers establish the cost that the final user must pay by concept of fixed charges, the cost of having access to the service, and different levels of consumption, classified in ranges as basic, complementary and sanctuary[43]. Now, considering the public service subsidy scheme, the strata 1, 2 and 3 receive a

[41] The focus is made on aqueduct because of the availability of the information.
[42] Those years correspond to the earliest and latest year with a high rate of reporting by the providers
[43] For more detail on the tariff structure, ranges of consumption and tariff methodology, see Appendix D.

corresponding subsidy up to 70%, 40% and 15% on their final fees and should, in principle, pay less than strata 5, 6 and non-residential users that make corresponding contributions up to 50% and 60% over their final fess (Law 1450 of 2011, art. 125). The emphasis of the analysis will be on strata 1, given that it is the strata with most subsidies, and the strata 4, which does not receive subsidies nor makes contributions. The Table 3 allows to identify across the regions, the municipality categories where strata 1 and 4 paid the most and the least in every one of the elements of the tariff structure.

Table 3. Distribution of highest and lowest fees for strata 1 and 4 across municipal categories by region.

Fee component	Region	Category where strata 4 pays the most	Category where strata 4 pays the least	Category where strata 1 pays the most	Category where strata 1 pays the least
Fixed charge	Amazonica	5	6	5	6
	Andean	1	5	Especial	5
	Bogota	Especial	Especial	Especial	Especial
	Caribbean	Especial	5	6	4
	Insular	*NA*	*NA*	*NA*	*NA*
	Orinoquia	5	3	1	3
	Pacifico	Especial	1	5	1
Basic charge	Amazonica	5	6	5	6
	Andean	2	6	2	Especial
	Bogota	Especial	Especial	Especial	Especial
	Caribbean	4	1	6	1
	Insular	*NA*	*NA*	*NA*	*NA*
	Orinoquia	2	5	1	5
	Pacific	Especial	6	4	6
Complementary charge	Amazonia	5	6	5	6
	Andean	2	6	2	6
	Bogota	Especial	Especial	Especial	Especial
	Caribbean	4	1	4	6
	Insular	*NA*	*NA*	*NA*	*NA*
	Orinoquia	2	5	2	1
	Pacifico	Especial	6	Especial	6
Sunctuary charge	Amazonia	5	6	5	6
	Andean	2	6	2	6

Bogota	Especial	Especial	Especial	Especial
Caribbean	4	1	4	6
Insular	*NA*	*NA*	*NA*	*NA*
Orinoquia	2	5	2	1
Pacific	Especial	6	Especial	6

Adapted from: SSPD (2025).

There is not a clear pattern driven by municipality category or region on the fees paid by strata. As an illustration, the mode for every fee component shows that the strata 4 has to pay the less in category 6 (in 40% of the regions) and 5 (in 30% of the regions). However, the strata 4 also has to pay more in municipalities of category 1 and 5 in 30% of the regions. On the side of the strata 1, the highest fees are present in category 6 (in 25% of the regions) and the lowest are evenly located in category Especial, 1, 5 and 6.

This indicates that the cost structure paid by final users of the same strata is not determined by the region or the municipality category where they are located. For further illustration, the Table 4 shows the different average fees in 2018 for a user in strata 1 in municipality category 6 on different regions.

Table 4. Comparison of average fees to users in strata 1 and municipality category 6 across different regions.

Region	**Fixed charge fee (COP)**	**Fee for basic consumption (COP/m^3)**
Amazonia	4638	387
Andean	3007	456
Bogotá	4593	1278
Caribbean	11052	2455
Insular	945	757
Orinoquia	63014*	691
Pacific	5234	691

Adapted from: SUI – SSPD (2025). Bogota counts as a municipality of category Especial, and the Insular region is counted as a municipality of category 5 but are included as references.
* This fee is exaggeratedly high, and probably represents an inconsistency in the reported data.

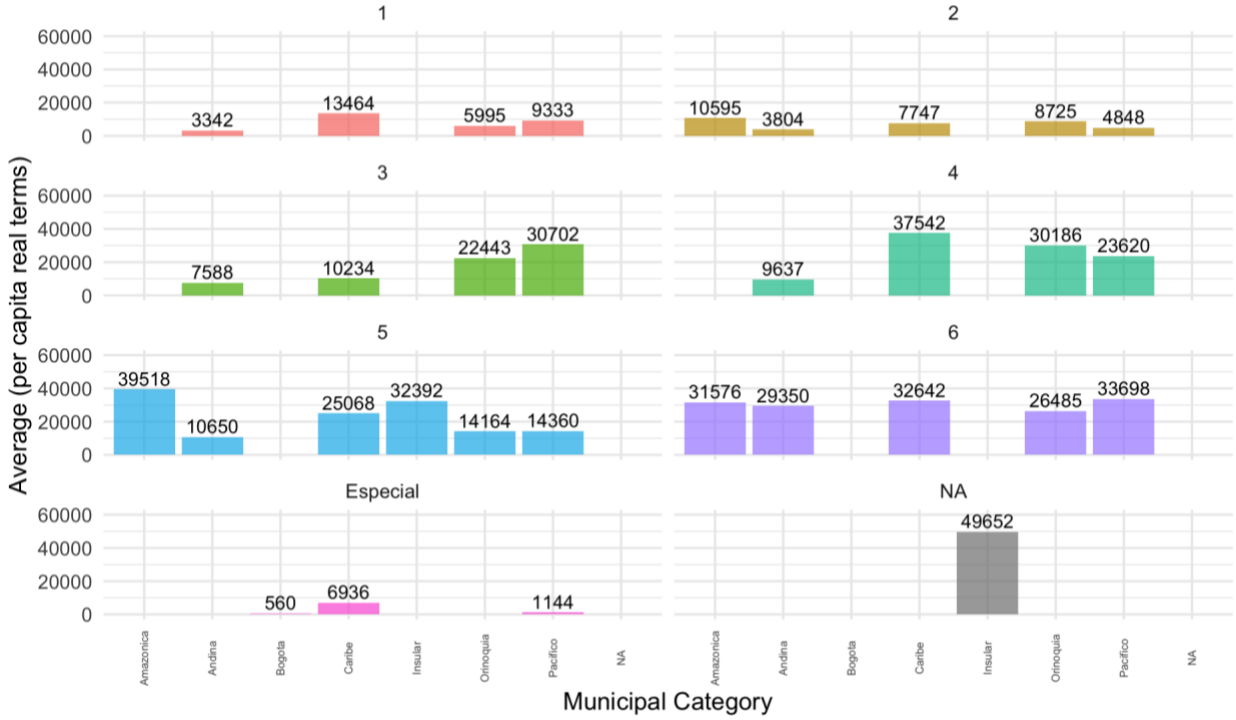
4.3.7 Total allocation by distribution criteria

4.3.7.1 Deficit in coverage

In contrast with the total SGP WASH, the pattern allocating more resources to the smallest municipalities is not followed in any region apart from Andean. The region where this is the most

visible is Pacific, where category 2 receives less than category 1, and category 5 receives less than category 6.

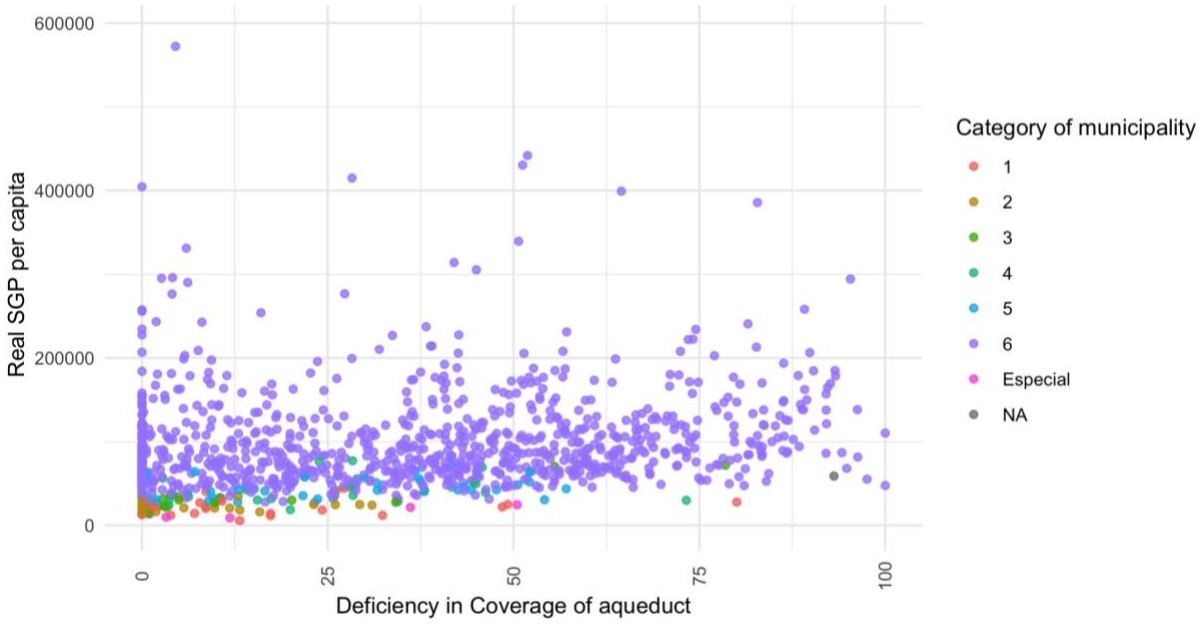
Figure 6. Average of WASH SGP allocation by criterion of deficiency in coverage 2024



Adapted from: SICODIS -DNP (n.d. -b).

Across all municipality categories, the smallest allocation corresponds to the Andean region, with the exception of category 6, where it is given to Orinoquia. Contrasting the SGP allocation with the quintiles of coverage by municipality category in 2024, it is possible to say that the municipalities with a lower level of coverage receive the biggest allocation in this criterion, as showed in Figure 7.

Figure 7. Distribution of coverage and WASH SGP allocations.
Panel A. Total aqueduct coverage and average of WASH SGP allocation by criterion of deficiency in coverage.



Panel B. Average of WASH SGP allocation and quintiles of total average coverage in aqueduct 2024.

Quintile of coverage	**1**	**2**	**3**	**4**	**5**
Average	35696	30301.89	28050.52	24885.89	24629.77

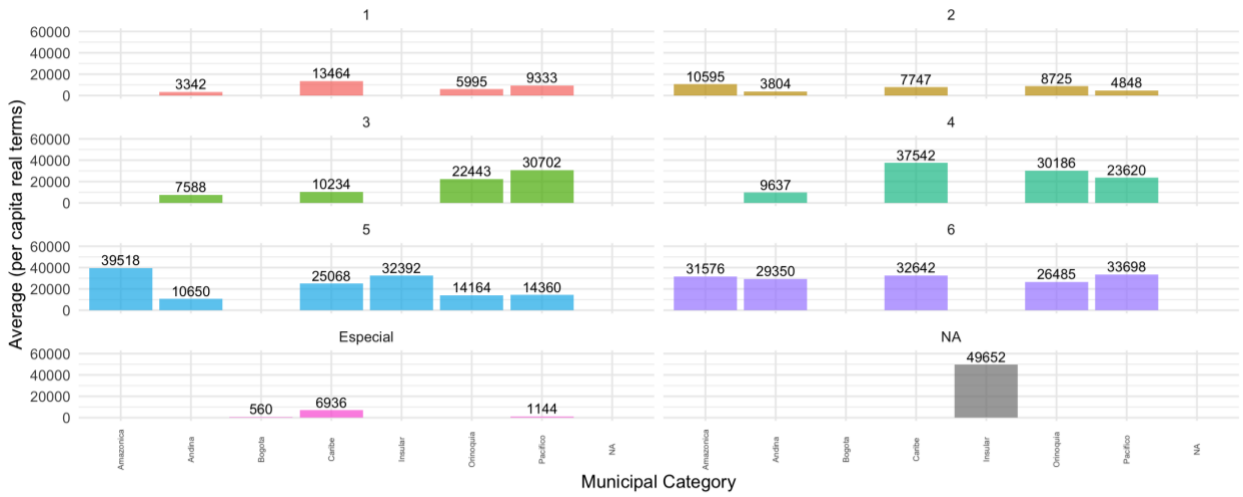
Note: the scale of quintiles goes from lowest to highest level of coverage. Adapted from: SICODIS -DNP (n.d. -b) and SSPD (2025).

4.3.7.2 Population covered and financial balance of the subsidy system

As it can be seen in Figure 8, there is not a clear pattern of allocation across categories of municipalities[44].

Figure 8. Average of WASH SGP allocation by criterion of covered population and financial balance of the system of subsidies 2024.

[44] Evaluating the balance of the subsidy scheme is out of the scope of this research. For more detail on this topic see (Gallego et al., 2019).



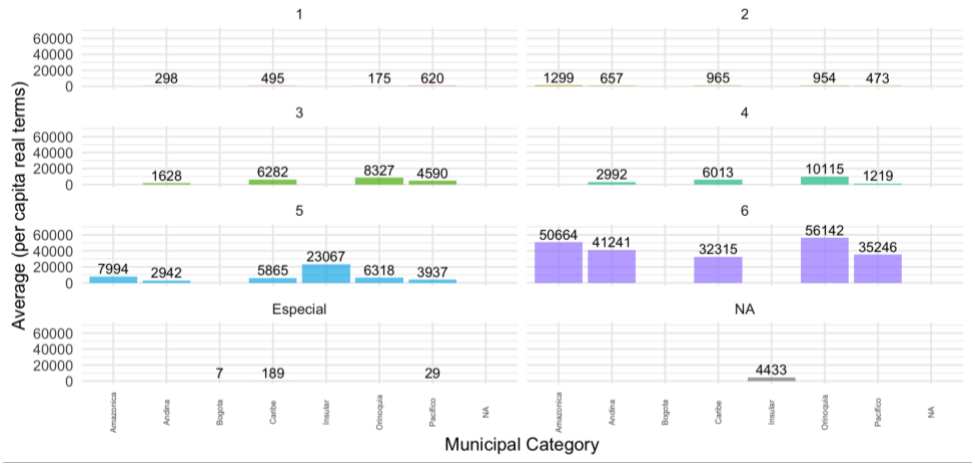
Adapted from: SICODIS -DNP (n.d. -b).

Across all regions, the Andean received the least allocation, except for category 6, where it received more than Orinoquia.

4.3.7.3 Level of multidimensional poverty[45]

The tendency to allocate more to the smallest municipalities is present in all regions. There is the observation that in Caribbean, Orinoquia and Pacific the category 5 receives less than category 4 in 2024, as it can be seen in the Figure XX.

Figure 9. Average of WASH SGP allocation by criterion of poverty 2024.



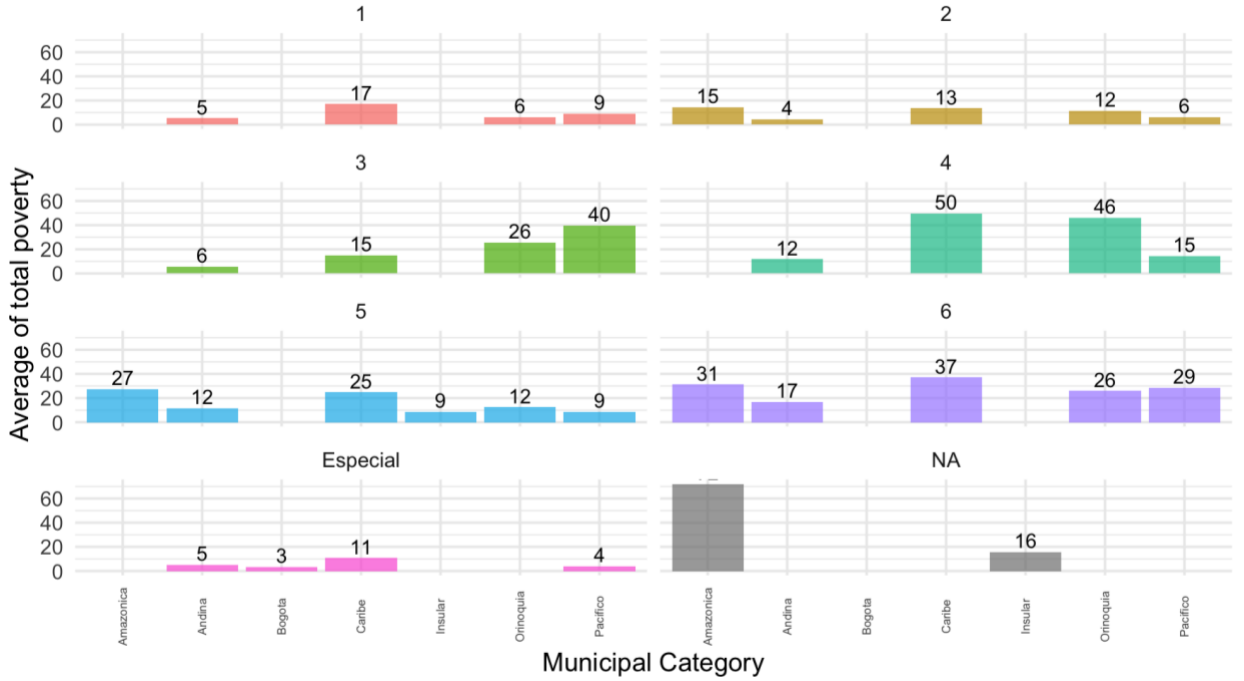
Adapted from: SICODIS -DNP (n.d. -b).

[45] Note that this comparison with the WASH SGP allocation is different to the one presented in section 4.3.3: this one compares the specific allocation made for the poverty criterion (with a ponderation of 20% on the total).

The Andean region has the least allocation only in category 3 and 5. In contrast, it receives more than Orinoquia in category 1; Pacific in category 2, and more than Caribbean and Pacific in category 6.

The allocation given by this criterion is not distributed to the municipalities with higher levels of poverty, as suggested by the distribution of poverty across municipality categories and regions in the Figure XX. Focusing on municipalities of category 4,5 and 6, it can be seen that the system allocates significantly different amounts to regions that have similar levels of poverty: an example is the bigger allocation in category 4 to Andean region in comparison to Pacific, or the allocation of category 5 between Amazonia and Caribbean. In some cases it does not allocate more resources to the regions that have the highest poverty rate, as in the case of Caribbean in category 5. Finally, category 6 is the one that presents the most irregularities, giving a significantly higher allocation to the Andean region than to Caribbean and Pacific, even though their poverty rates are almost double.

Figure 10. Distribution of total poverty by category of municipality and region in 2018.



Adapted from: DANE (2022).

The SGP allocation by poverty quintiles in 2018[46] confirms this, where it is evident that the allocations favour both the third and the fourth (second to last) quintiles of coverage in Table 5.

Table 5. Allocation of the SGP WASH by the poverty criterion
Panel A. Allocation by quintiles of total poverty 2018.

Quintile of total poverty	**1**	**2**	**3**	**4**	**5**

[46] The most recent year with disaggregated information in poverty, given by the census of 2018.

Average	7830.371	25476.46	30232.45	26982.50	24296.04

Panel B. Allocation of the SGP WASH by poverty in services criterion

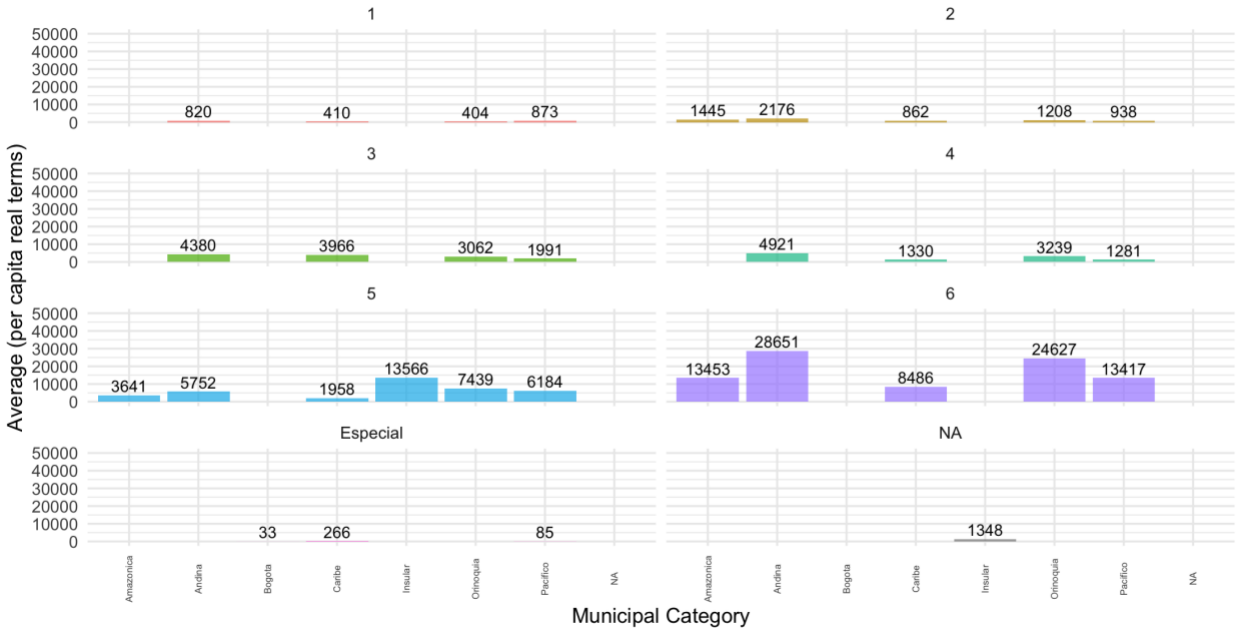
Quintile of total poverty	**1**	**2**	**3**	**4**	**5**
Average	46999.40	68459.75	79312.79	78107.4	86499.00

Adapted from: DANE (2022).

4.3.7.4 Fiscal and administrative efficiency

It is visible the greater allocation done to the smaller municipalities in categories 5 and 6 in 2024. Across regions, Andean receives more than the others in categories 2,3, 4 and 6.

Figure 11. Average of WASH SGP allocation by criterion of fiscal and administrative efficiency 2024.



Adapted from: SICODIS -DNP (n.d. -b).

The efficiency criterion was established as an incentive for municipalities to comply with fiscal, administrative and sectorial standards for the provision of the service. Contrasting the allocation with the quintiles of coverage of aqueduct in 2016 on Table 6, it is possible to see that the municipalities that receive more correspond to the ones that have a minor level of coverage when considering the total[47] coverage.

[47] However, there is no information about how every municipality distributes the SGP resources between its urban and rural areas. Consequently, the total indicator ponderated between urban and rural areas might be the most accurate.

Table 7 considers the allocation made by categories of quality of water in 2024, finding that it allocates more to areas with low risk[48]. Finally, considering the quintiles of poverty, the criterion allocates more to municipalities with higher levels of poverty, as seen in Table 8.

Table 6. Quintiles of aqueduct coverage and average allocation by efficiency criteria in total areas.

Quintile of coverage	1	2	3	4	5
Average	5691.583	5125.899	4880.724	4690.258	4836.625

Source: adapted from: SICODIS -DNP (n.d. -b) and SSPD (2025). Note: the level of the quintiles is organized from the lowest to the highest level of coverage.

Table 7. Categories of water quality and average allocation by efficiency criteria in total, urban and rural areas.

Categories of water quality	1	2	3	4	5
Average	16157.05	23838.16	22435.41	22137.27	16417.83

Source: adapted from: SICODIS -DNP (n.d. -b) and INS (2025).

Table 8. Allocation by efficiency criterion and poverty quintiles

Quintil of poverty	1	2	3	4	5
Average	3250.349	3630.227	4158.987	4256.089	5163.428

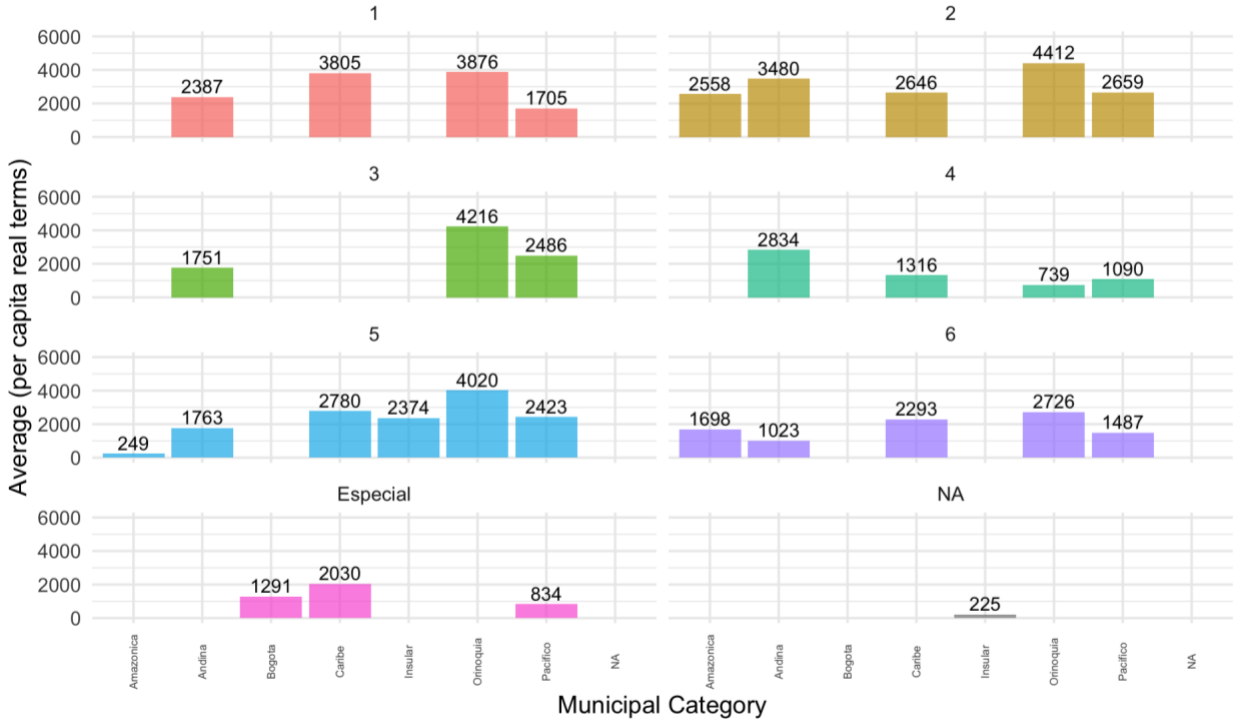
Adapted from: DNP (n.d. -b), SSPD (2025). Note: the level of the quintiles goes from the least to the highest level of poverty.

4.3.7.5 Effort of the territorial entity to increase coverage

Across categories of municipalities, it is possible to see in Figure 12 that the least allocation is given to municipalities in category 6, whilst the biggest allocation is to municipalities in category 2.

[48] Accounting for the total area pondering rural and urban zones

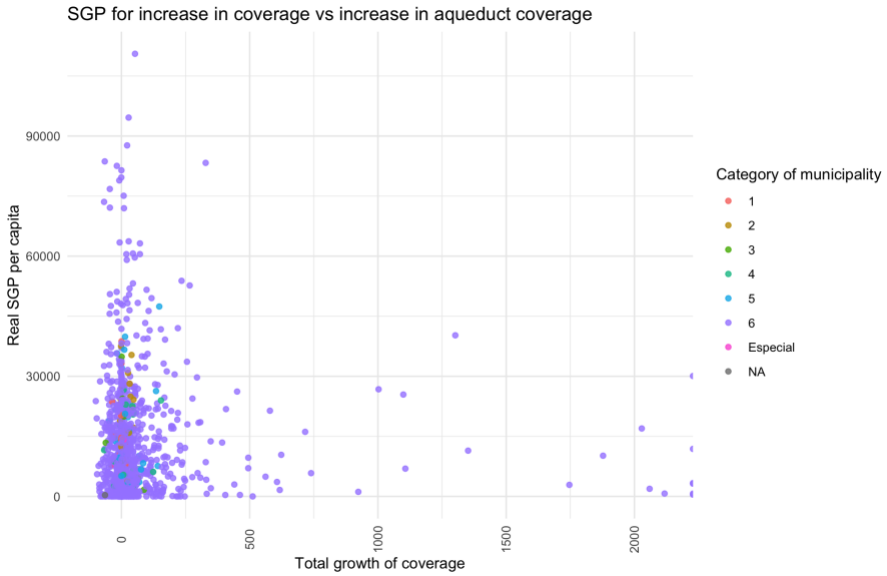
Figure 12. Average of WASH SGP by criterion of increase in coverage 2024.



Adapted from: SICODIS -DNP (n.d. -b) and SSPD (2025).

The Andean region is the one that receives the least allocation in municipality categories 1,2,3 and 6. On the other hand, in figure XX, it is possible to see that the growth in coverage from 2017 until 2024 has not been accompanied by a higher allocation of resources.

Figure 13. Average of WASH SGP by criterion of increase in coverage and growth in coverage 2017-2024 by category municipality.



Source: adapted from SICODIS -DNP (n.d. -b) and SSPD (2025).

4. Discussion

4.1 Profiles of the regions and total WASH SGP allocations

The redistribution made by the WASH SGP should not be understood only in terms of the resource allocation outcomes between regions and municipalities but must also be grounded on the consideration of criteria that allow for a comparison on the level of capacities and needs of the municipalities. This brings forward the discussion of what equalization criteria offers the 'fairest' distribution of resources, that in the Colombian decentralization process was reflected in two main objectives: to provide some degree of fiscal equalization among jurisdictions (Bird, 1983, p. 467), and to ensure the fastest universalization of the services (DNP, 2016, p.14).

Departing from the objective to reach for fiscal equalization, section 4 suggests that while the SGP in general allocates more resources to the regions with lower per capita tax capacity in the biggest municipalities, it presents important mismatches in categories 4, 5 and 6. This does not mean that the WASH SGP does not have a redistributive effect: the system has a progressive component and makes a higher allocation to municipalities in categories 4,5 and 6, similar to the findings of Bonet-Morón and Ayala-García (2015) for the general SGP[49]. The nuance comes when looking at the differences between regions: while Caribbean and Pacific present the smallest tax capacity, also in line with Bonet-Morón, Pérez-Valbuena, and Montero-Mestre (2018), they receive less than the two regions with strongest tax capacity, as Orinoquia in categories 2-6, and Andean in category 6. Interestingly enough, in the general transference system as well as in the WASH SGP are not included variables to achieve fiscal equalization (DNP, 2024; Bonet-Morón and Ayala-García, 2015). Measures of equalization in terms of expenditure, such as the per capita expenditure in public services by municipality are not considered either.

Considering proxies to approximate the level of required expenditure in WASH, the component of poverty is taken by the system as an imperfect proxy (Bonet-Morón and Ayala-García, 2015).
In category Especial, 1 and 2, it does not provide a guiding criterion for the allocation of resources, given the similar magnitude that is presented between regions. In categories 3,4 and 5, it distributes more to the smallest municipalities, but it does not respond to the high levels of poverty of Pacific and Orinoquia in categories 3 and 4. In category 6 it presents the same pattern of a higher allocation to the Andean region present in the total level of poverty. Considering the average allocations by quintiles of poverty in services, while there is a general tendency towards allocating more to the areas with a higher level of poverty, there is still a higher allocation to the third quintile in comparison with the fourth.

In summary, the allocations made by the WASH SGP in general terms respond to the size of the municipality and, in some degree, to the level of poverty in the bigger categories, but the current allocations are still missing elements to reach full progressivity. There are two main limitations of the SGP allocations with this variable: first, it does not respond to the high level of poverty of some regions in categories 3 and 4, giving them a smaller amount than category 6. Secondly, on category 6 the Andean region receives a similar amount than Amazonian and significantly more than Caribbean and Pacific, both in the total level of poverty as well as in the component for

[49] With all the categories: health, education, WASH, general purpose,

services. Finally, as shown in the allocation by poverty quintiles, the current allocations of the system are still missing elements to reach full progressivity.

On the side of the fees paid by the final users differentiated by strata, it could have been expected that the average costs were higher in the smallest municipalities because of the fragmented provision of the service and the consequent loss of economies of scale (Fernandez and Londoño, n.d). However, the fees to the final users places an interesting contrast with the previous criteria considered for equalization, as it does not present a clear tendency of distribution across categories of municipality or region. This means that, even if a household is classified within strata 1, the one with lowest economic capacity, it could pay a higher fee than a household in strata 3, a higher strata, if it changed its location across municipality categories in the same region, or if it changed its location across regions on the same category. If well the redistributive effects of the system of subsidies, that balances the fees paid by households with different economic capacities, is outside of the reach of this document, the distribution of the fees[50] raises an important point: that the redistribution of resources is incomplete without considering the costs of service provision, as signalled by (Bonet-Morón and Ayala-García, 2015).

Now, while some of the determinants of the cost of service provision are considered directly in the WASH SGP distribution criteria, others such as the availability of the water source, the required treatments for water potabilization and the cost of maintenance and operation (among others) are considered only by the criteria of deficit in coverage (with a ponderation of 35%), leaving the door open for a mismatch between the allocation made and the amount of resources needed for the provision. This means that even if a municipality receives a high SGP allocation, it might not be enough to level the costs faced by the final users, in comparison with municipalities on the same category that receive a similar allocation but have a lower distribution of costs.

The consideration of the per capita tax capacity, the level of poverty in total and by services, and final user's fee structure set an important foundation for evaluating the distribution of resources made by the allocations of the WASH SGP. Despite the great heterogeneity of the regions and the municipalities, we can (unsurprisingly) still identify two main tendencies: that at the regional level, Andean is the strongest, with the highest tax capacity and lowest level of expenses; at level of categories of municipalities, the category 6 presents both a high level of poverty (although not the highest) and the lowest tax capacity.

4.2 Allocations by criteria of distribution

Now, evaluating the allocation of the WSH SGP by distribution criteria, there were strong reasons to expect that the criterion of fiscal and administrative efficiency had given the smallest allocation to the municipalities in category 6 across the regions. First, according to the reports of the inadequacy of the monitoring system for the smallest municipalities and providers, as mentioned on Section 2, it would have been expected that the criteria of fiscal and administrative efficiency had done a minor allocation to those municipalities, as many of the indicators for this criteria include consistent and extense reporting in the monitoring systems. The distribution criterion based on efficiency can be seen as a way to incentivize the subnational units to comply with sectorial goals (Oates, 1972). However, that this criterion does not consider the structural factors

[50] The data on cost service provision from the perspective of the service providers was not publicly available.

surrounding service outcomes can have negative consequences from an equity perspective, as the areas with poorest performance can correspond to the areas that need most strengthening of their capacities, but are given less resources.

Surprisingly, the data presented in section 3 actually showed that the allocation by this criterion was the highest for the municipalities in category 6, and the highest for areas across with lowest coverage and highest prevalence of poverty, between all regions. Considering that there was an 'intentional effort' of the regulatory entity to use the variables and methodologies that would privilege the allocation to this category (Resolution 0700 of 2024, MVCT), it could have been suggested that this distribution criteria reflected the prioritization of equalization in the SGP and that the methodology of distribution had aimed/worked towards the objectives of the of the decentralization process.

However, an important nuance comes when considering differences between regions. The fiscal and administrative efficiency criterion (with a ponderation of 10%) allocated a major quantity to the Andean region, giving to Caribbean and Pacific only a 30% and 46% of what it received in category 6. The Andean region would also receive for this criterion more than all the other regions in categories 2,3 and 4. This outlook is complemented when considering that in the total allocation and other three remaining distribution criteria, Andean had a higher allocation in category 6 than the others: it received more than Orinoquia in the criteria of deficit in coverage and population covered and financial balance of the subsidy system; and more than Caribbean and Pacific in the total allocation and the criterion of the level of poverty. This mismatch in the poverty criterion and the SGP allocations goes in line with Bonet, Pérez, and Ayala (2014).

Those 'mismatches' in the allocations between regions are not minor when considering that Andean in general terms presents a higher per capita tax capacity than Caribbean and Pacific, and that it counts with the lowest level of poverty (in total and by services) across all the regions. That Andean receives major allocations in the smallest municipalities is even more relevant when considering that this region concentrates 57% of all the municipalities in this category, in comparison with Caribbean (18%), Pacific (16%), Orinoquia (4.86%) and Amazonian (3.9%).
On a first instance, it implies that a significant part of the resources are being concentrated in the region with the highest concentration of the population. Secondly, it also means that there are less resources available to attend the regions that present a more critical outlook in terms of capacity to generate income, their level of expending in the WASH sector and levels of poverty.

Considering the objectives of the WASH SGP, and the justifications behind the use of a formula of distribution, it would have been expected that this mechanism would have allocated the resources according to the indicators presented by each municipality and therefore, that it would have avoided the presence of a bias towards any region or category of municipality. If well the system allocates a major part of the resources according to the different distribution criteria, the presence of a higher allocation to the Andean region mostly in category 6 (but also present in some other cases) despite the differences with the indicators of other regions raises an important question on the functioning of the WASH SGP: why the allocation in this particular category is not being done according to the performance in the indicators established?

That the allocation is made by formula does not mean that it is completely objective, or that it is free of "political interferences", as it is often suggested by the literature. The fact that the SGP is a mechanism of redistribution of resources itself means that there is an underlying centralization of economic resources that the system aims to address. Under this context, the election of both the distribution criteria and the mechanisms of distribution will be guided by the values of the State and the existing structure of political participation on public decision-making and policy design. In this sense, the reports made by the Decentralization Commission (DNP, 2024) in relation to the distribution criteria of the general SGP pointed out that the service parameters considered as "standard" corresponded to metrics based on the institutional, social and economic characteristics of the Andean region, "punishing the diversity" and misunderstanding the context for service provision of the other regions.

As mentioned in Section 1 and 2, the design of the WASH SPG obeyed to multiple purposes. It aimed to provide some sense of equalization of resources between the national and subnational governments, but it also implemented "efficiency" criteria to incentivize the subnational units that complied with established sectorial standards. The combination of different distribution criteria and ponderations is necessary to attend to the multiple objectives of the system, but also complicates the outlook obtained from the aggregation of the total allocations.

While a redistribution of resources from the biggest to the smallest municipalities is evident in that the municipalities of category 6 receive more on the total WASH SGP, the different effects of the criteria between regions generate important mismatches at the aggregate level. An illustration is the already mentioned case of the fiscal and administrative efficiency, that although distributes more to the category 6, makes such a marked allocation between regions that has effects on the aggregate redistribution reached by the WASH SGP.

However, the effect of the efficiency criteria on the aggregate allocation at least responds to the regional behavior of the established indicators. The allocations corresponding to the poverty criteria, on the other hand, present a tendency that does not correspond to the objectives and methodology of distribution of the system. That in category 6 Andean receives more than Caribbean and Pacific despite their different level of total poverty, as well as the high allocations to areas in intermediate poverty quintiles, indicates the existence of a third factor that overruns the behavior of the elected criteria and allocates the resources privileging the smallest municipalities that belong to the Andean region.

Conclusion

The decentralization process in Colombia did important changes at the political, administrative and fiscal dimensions at the end of the XX century. Across the territorial entities, it conceived them with the autonomy to elect their political representatives, make them accountable for the provision of public services and established systems for redistribution of resources. The intergovernmental system of transfers -SGP created in 2001 was conceived as the materialization of the decentralization process, serving the multiple purposes of funding departments and municipalities in their recently assigned responsibilities in public service provision, providing some degree of equalization among subnational governments, and reach the fastest achievement of the universalization of public services.

The allocations made by this system ranked the subnational governments through a formula with distribution criteria that aimed to enhance the efficiency and the equity of the available resources. As the third sector that would be prioritized the most after education and health, WASH services have been object to multiple policies and programs that have had the objective of addressing the stark gaps in coverage and quality of this services between the different regions of the national territory, as well as between the urban and rural areas.

However, the deficient sectorial outputs between the regions, as well as the reported inadequacies of the WASH SGP design to recognize the heterogeneity of the national territory put a question mark on the role that the SGP actually plays in the resource allocation for WASH. Particularly, it questioned if the system allocated resources responding to different characteristics of the regions, as their capacity to generate income, their level of expenditure, and the cost of service provision. Secondly, it questioned if the system that was supposed to redistribute resources was actually making allocations favouring the region that already concentrated most of the population, economic activity and political power: the Andean region.

After analysing the municipality profile in terms of its capacity to generate income, the level of expenditure and the fees to the final users in the service of aqueduct, this data was contrasted with the allocations made by each one of the distribution criteria. The role of the WASH SGP in the redistribution of resources across regions is full of nuances.

On a positive light, its establishment in 2007 did an important adaptation of the distribution criteria from the general purpose to the water and sanitation category, setting the foundation for a distribution of the resources tailored to the sector. The WASH SGP, despite of being afflicted by a stunting similar to the one of the general SGP, represents the most important source of resources to the different territorial entities for the provision of water and sanitation. Working towards its objectives, it makes greater allocations to the smallest municipalities and responds, in general terms, to their performance in the different indicators of the distribution criteria, mainly for the biggest categories.

Nevertheless, important limitations on its design and mechanisms hinder its potential as a redistributive tool to address inequalities between regions, especially amongst the municipalities of category 6. On a first instance, the imposition of standards and monitoring systems that reflected the context and the institutional realities of municipalities in the Andean region has difficulted the achievement of the same standards in areas with diverse contexts. Particularly in the criterion of

fiscal and administrative efficiency, the incompliance of those standards comes with less resources for the subnational governments, which instead of perceiving incentives for a better provision are faced with a minor allocation and higher pressure for the execution of their resources.

This regressive tendency in principle is counter balanced by the design of the system balancing criteria of efficiency and equity. However, the aggregate effect of pursuing multiple objectives simultaneously results in a mismatch between the allocations received and the performance of the municipality in the different distribution criteria. This explains why stronger regions such as Andean in category 6, are receiving in total an amount of resources superior to other regions with a different profile in their capacity to generate income, a higher level of expenditure required and lower level of WASH coverage, such as Caribbean and Pacific.

Lastly, if well the distribution of the SGP is based on the performance at formula-based indicators, there are factors left outside of the distribution criteria that still affect the final allocation done to the municipalities. This is the case of the criterion of poverty, that provides a major distribution to the municipalities of category 6 in the Andean region than to the ones situated in Caribbean or Pacific.

These findings are relevant when considering regional differences between the same category of municipality, as the municipalities in category 6 in Andean have both a higher capacity to generate tax income, lower level of poverty and significantly higher WASH coverage rates that in Caribbean and Pacific. The evaluation of two dimensions of classification, both category of municipality and region, is a contribution[51] of the present document, as it allowed to see nuances that would not have been visible if following previous methodologies that analyse variables considering only one dimension of classification (i.e., only category of municipality) at the time.

Consequently, public policies that aim to have a redistributive effect such as the WASH SGP must take an integral baseline and consider the individual performance of municipalities under the light of the region where they are located and their whole institutional context. Among other recommendations, there is still room to revisit the operation of the distribution criteria and reach a more equitable distribution of the WASH SGP, departing from the setting of clear objectives and the structural limitations and trade-offs of the SGP. Finally, the categorizations used for the evaluation of policies, such as the categories of municipalities, can be reviewed to propose groups that enable the understanding of general tendencies among different areas, but that don't obscure relevant heterogeneities between similar units.

Questions outside of the scope of this document are proposed for future research, with the aim of deepening the understanding of the relationships between the WASH SGP, the allocations made between subnational governments, and the outputs in water and sanitation in Colombia. Firstly, a study similar to the one here presented, but including the services of sanitation and waste management would provide an outlook differentiated by region of the redistributive effects from the WASH SGP, allowing for the identification of complementarities between the services and areas for prioritization.

[51] Acknowledging the diverse limitations mentioned on section 4.

At an operational level, given the importance of data availability for the distribution process and the reports of the lack of sufficient information by the providers of the service, it is worth asking how the system deals with this lack of information, what assumptions are being made to continue with the process of allocation, and what consequences does it bring for different groups of municipalities.

Finally, if well the SGP represents the most important funding source for the provision of WASH at the municipal level, its scarce growth over time and the modest changes in WASH service outputs on multiple areas of the national territory raise a question on the relationship between this allocations and the coverage and quality of WASH services. The last research of this kind was done by Faguet (2011) and Sanchez (2006), who did not find a significant relationship between the resources of the SGP and the coverage of aqueduct. However, given the reforms done to the sector and the institutional changes brought by the further implementation of the decentralization process , it would be important to evaluate if its main financial instrument continues to play a secondary role on the service output in coverage and quality of the WASH sector in Colombia.

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Appendix

Appendix A.

Classification of the municipalities.

Table 1. Classification of municipalities

Group	Category	Population	Income in SMLV
First Group – Big municipalities	Special	>500.000	> 400.000
	First	100.001 – 500.000	100.000 – 400.000
Second Group – Intermediate municipalities	Second	50.000 – 100.000	50.000 – 400.000
	Third	30.000 – 50.000	30.000 – 50.000
	Fourth	20.000 – 30.000	25.000 – 30.000
Third Group – Basic municipalities	Fifth	10.000 – 20.000	15.000 – 25.000
	Sixth	<10.001	<15.000

Taken from Decree 2106 of 2019, art. 153. Income is referring to the municipal current ordinary revenue of free destination. SMLV refers to the monthly legal minimum wage for a full-time job.

Appendix B.

Natural Regions of Colombia

Colombia is usually classified in 5 regions, that are grouped according to the predominant ecosystems located in them. In Figure 1, taken from Cespedes et al, (2019) it is possible to see the departments belonging to each one. In the document, Insular (San Andrés, Providencia and Santa Catalina) and Bogotá were considered as regions apart from Caribbean and Andean.

Figure 1. Classification of the natural regions of Colombia

Taken from Céspedes et al., 2019, p. 4.

Appendix C.

List of fundable activities in WASH with the resources from the SGP (Law 1176 of 2007, art. 11). Translation made by the author.

a. Subsidies to strata that receive them according to the law
b. Payment of debt originated in the WASH sector
c. Pre-investment in designs, studies and interventories for projects in WASH
d. Improvement of organizational schemes for management and operaion of WASH in rural and urban zones
e. Buiding, ampliation, optimization and improvement of WASH systems and public services
f. Micro and macro measurements
g. Reduction of water wasted in the distribution process
h. Acquisition of required equipment for the operation of WASH
i. Participation in the structuring, implementation and investment in infrastructure of regional schemes in the provision of the services.

Appendix D.

Tariff structure of aqueduct

Defined by the CRA, the tariff methodology to define the fees charged to the final users is composed of the following elements (CRA, 2021):

- **Connection fees**

  Not included in the document. Charges of the fees related to the conection of the service either for the first time or for interruption of the service.

- **Fixed fee**

  To reflect the economic costs of ensuring the permanent availability of the service to the user, independently of the level of use.

- **Varible fees**

  Charged by the level of consumption of the household, according to the ranges of consumption shown in Table 2.

Table 2. Ranges of consumption of drinking water.

Meters above sea level	Basic Consumption (m3 per month)	Complementary Consumption (m3 per month)	Sunctuary/ Excessive Consumption (m3 per month)
< 1000	= 16	16 - 32	>32
1000-2000	=13	13 - 26	>26
>2000	=11	11 – 22	>22

Source: adapted from Resolution CRA 750 of 2016 and Decreto Único Reglamentario 1077 of 2015.

Appendix E.

Use of AI.

The partial assistance of AI, ChatGPT, was used in two main tasks:

- Referencing. First, I did the references trying to follow the Harvard cite them right 12th edition formatting, and then asked the AI to adjust the citation where needed wih the following prompt: “adjust this list of citations to Harvard cite them right 12th edition”
- Coding. Specific questions to correct errors and generalize repetitive tasks in the process of cleaning the database were supported by the AI.