# Clean energy or extractive industry?

## A comparative study on the media representation of hydroelectricity in Colombia and Guatemala

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### Introduction

The Guatemalan Government de-monopolized and privatized the electricity market between 1996-2000, with the justification that, first, rural electricity coverage – which was less than 50% at the time – was a significant obstacle to human development; and second, that there were large unexploited energy resources, especially hydroelectricity. The strategy led to quadruple the installed capacity of the network in twenty years, while private hydro generation grew 6000% (Paz Antolín 2004, Ministerio de Energía y Minas 2016). However, neighboring rural communities have received the hydroelectric expansion with sustained protests and resistance, because of their impact on water use, among other claims (Orantes 2010). This has led to a perceived association of hydropower with extractive industries such as mining or oil. Take for example this quote from the activist blog, A*lbedrío.org:*

> The Mayan People on resistance know that there is no more territory to go as they run away from the "development of the others". Organized communities have already made around 80 public consultations that have clearly rejected the *hydromining invasion* of their territories [translation by the author, emphasis added] (Itzanmá 2014).

Such association is interesting from an STS perspective, for two reasons, mainly: first, it challenges conventional views of hydropower as a clean energy source that reduces environmental impacts, especially those related to climate change; and second, because it suggests the idea of a large heterogeneous techno-industrial complex, that comprises hydroelectricity and mining and that is extracting the valuable natural resources of one country.

As part of a larger research project, this article looks into the media representations of hydroelectricity in Guatemala and Colombia by means of software-assisted content analysis of opinion articles in news media, using the media monitoring methods described by Neresini & Lorenzet (2014). Its objective is to determine which aspects are common to both media

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scenarios and which are not, with special interest on the representation of hydroelectricity as a part of a larger, all-encompassing, extractive complex.

**Literature review**

The research problem discussed here rises from the convergence of two events that have developed in recent years: the expansion and privatization of the electricity market in Guatemala, and the increasing agrarian and environmental conflicts in the rural areas of the country. The scientific literature that analyzes the first event is relatively scarce. One of the first articles published (Harris 2002) focused on the distribution and consumption side, particularly on the subsidy-based policy that was used to promote the expansion of rural coverage. An analysis of both ends of the market is made instead by Paz Antolín (2004), in which the first results of the expansion of the electrical market were criticized, and which also anticipated correctly some of the problems faced currently by distribution companies. Another critical study on the subject (Taylor 2005) also focused on the distribution side of the business by surveying the residential users of the rural electrification program. It finds, interestingly, that "rural residents prefer other forms of development, like the introduction of potable water, or improved schooling" (Taylor 2005, 173).

In contrast, there is a significant amount of studies regarding the rising environmental conflictivity in Guatemala. One of the first comprehensive efforts to approach the subject was the work of Hurtado (2006) which is the first map of natural resources exploitation and related social protests. A more detailed account (Martínez Aniorte & Villagrán García 2009) covered a broad set of conflicts all over the national territory, which was complemented by a study of the Guatemalan Rafael Landívar University (URL, IARNA & INGEP 2009) that analyzed the conditions of environmental management at the local level in Guatemala. Other studies approached the conflicts from a regional perspective. For example, Elías (2009) studied large-scale projects on indigenous territories in Guatemala and linked them to the neo-colonization of Latin America by transnational corporations. Villafuerte Solís (2014) discussed the megaprojects developed for interoceanic canals in each country and how they fit into the framework and logic of extractivism.

There has been a significantly larger amount of studies of mining conflicts in Guatemala than hydropower. For example, Rasch (2013) linked the origin of the conflicts to the sequels of the Guatemalan Civil War (1960 – 1996). Yagenova & García (2009) described and discussed the resistance of the Sipakapan people against the opening of the Marlin gold mine by the Canadian Goldcorp. There are also studies like Fulmer et al. (2008) approached these conflicts from the national and international legal framework.

Other studies had a broader approach. For example, Aguilar-Støen & Bull (2016) discussed the role of the Guatemalan elite on the recent mining conflicts. Some of the studies did grouped mining and hydroelectricity conflicts together, but for research purposes. One example is an analysis of both industries (Aguilar-Støen & Hirsch 2015) that focused on the effectiveness of the Environmental and Social Impact Assessments (ESIAs) in hydroelectricity and mining. Another example is the paper by Kuniholm & Wayland (2016) that used spatial and multilevel regression modelling, and found correlations between the type of project developed and the history of the communities, and the incidence of environmental conflicts on them..

Orantes (2010) produced the first comprehensive study of the conflicts surrounding hydropower plants at the national level, including a map of the projects and conflicts, and interviews with relevant actors. Another study that discussed the conflicts in the national level was the report prepared by the think tank Central American Business Intelligence (De León 2016), which projected future scenarios and recommended reforming the legal framework of the energy market to reduce them. Most of the existent literature focuses on case studies of single conflicts. One example is the report sponsored by OXFAM (Guereña & Zepeda 2012) on the conflict that erupted around the development of the Hidro Santa Cruz project, in Huehuetenango, owned by the Spanish corporation Hidralia.

The studies so far have paid little attention to the sociotechnical aspect of the conflict. The above-mentioned study by Aguilar-Støen & Hirsch (2015) did discuss the role of ESIAs as sociotechnical artifacts with embedded politics. Another example is the study by Cofiño (2014) that approached the development of hydroelectricity projects from a governance perspective, presenting the alternative of a community-managed micro-hydroelectric plant.

**Theoretical framework**

Before discussing the methods used for this study, it should be clarified what does “media representations” means in this context. A convenient starting point is social representations theory (Moscovici 1961), a framework developed in social psychology in the second half of the 20th century, and defined by Wagner as follows: “a social representation is the ensemble of thoughts and feelings being expressed in verbal and overt behaviour of actors which constitutes an object for a social group” (Wagner 1999, 96). According to social representations theory (SRT), they are generated by a process made up by two phases, anchoring and objectification (Moscovici 2000, 42). A consequence of this process is that if two groups have differences regarding culture, literacy, history, socioeconomic situation, etc. their social representations of the same event or phenomenon will be different (Wagner et al.

1999, 99). Another important concept for SRT is cognitive polyphasia, which refers to the fact that in the same individual, or collective, can coexist different types of knowledge, and with it, different kinds of rationalities that are used interchangeably (Jovchelovitch 2002). .

SRT has proved to be especially useful to study how people respond to environmental hazards and concerns. Lima & Castro (2005), for example, have shown how environmental hyperopia, i.e. the incongruity between global and local environmental concerns, is related with cultural views about nature. A research team led by Brondi produced a study (Brondi et al. 2014) in which they analysed, using SRT, the parliamentary and press discourses on sustainable energy in Italy. Using the distinction between hard and soft energy paths (Lovins 1976), they look for arguments that advocate each of them (Devine-Wright 2007). Arguments for hard energy paths, "are based on the idea that energy is a matter of national interest, largely use techno-scientific rhetoric, and propose a deficit representation of the public as lacking knowledge or capacities for dealing with such difficult issues" (Brondi et al. 2014, 39). Whereas, arguments for soft energy paths, "are based on representations of energy as an ecological resource that should be saved, insist on the idea that energy systems can be decentralised, give value to lay knowledge and propose a view of the public as active and environmentally concerned" (Brondi et al., 2014, p. 39).

**Methods**

To better understand the media representations of hydroelectricity and its conflicts in Guatemala, it was necessary to determine which of them could be specifically associated to the country, and which of them could be described as more general representations on a broader context. That is the reason that a comparative study was undertaken, which required to select a second country in order to monitor its media. The criteria for selecting the country consisted of two guidelines. First, it had to be a Spanish-speaking, South American nation, because they share with Guatemala a colonial past and a common language. This meant that it was more likely that some representations are shared, since they are bound to cultural, social and historical context (Moscovici 2000). Central American countries and Mexico were excluded since, in their case, it was deemed that their common history with Guatemala could result in representations that were already too similar.

The second guideline was that the country selected had to have a historical and current situation of environmental conflicts, especially regarding mining and hydropower, as Guatemala. The reasoning for this guideline is that if both countries in the survey had hydroelectric and mining industries, and in both of them conflicts have emerged, then it could be expected some similarity in their media representations of them. Then it would be

plausible to assert that any difference between them could be a consequence of different national and social contexts. With these guidelines in mind, a search for the country that better fitted them was conducted on available databases of environmental conflicts. Two databases were of particular help for the choice: the Environmental Justice Atlas (Lea, Del Bene & Martínez-Alier 2015) and the Map of Mining Conflicts of Latin America (Observatorio de Conflictos Mineros de América Latina 2015).

| Country | Mining Conflicts | Hydropower Conflicts |
|---|---|---|
| Argentina | 26 | 2 |
| Chile | 35 | 5 |
| Colombia | 12 | 8 |
| Ecuador | 7 | 5 |
| Peru | 35 | 2 |

**Table 1. South American countries with environmental conflicts over mining and hydropower; the numbers correspond to the year 2015. Prepared by the author with information from (Lea, Del Bene & Martínez-Alier 2015, Observatorio de Conflictos Mineros de América Latina 2015).**

As Table 1 shows, Argentina, Chile and Peru had a larger quantity of mining conflicts over hydropower, so they were discarded. This left the choice between Colombia and Ecuador. Colombia was selected because the number of conflicts was closer to that of Guatemala.

After selecting the country, the news websites were chosen. For this inquiry, an opinion article was considered to be a written text in an online news medium, in which the author discusses current issues while giving his or her opinion on the matter. An online news medium was defined as a regularly maintained and updated website produced in one of the two countries whose principal purpose was to publish news directed to a national audience. The criteria for selection were two: first, the websites had to be among those with the most internet traffic in the country; second, the websites had to be reputable, i.e. from a company, organization or journalist that is trusted as a reliable source. A valid criticism of this approach is that it could fail to take into account alternative journalistic sources that could give voice to dissenting perspectives. Nevertheless, it was decided to keep these criteria, since the objective was not a broad social representation of hydroelectric energy but a specific representation of hydroelectricity from the online media industry.

In order to determine which news websites in Guatemala and Colombia had the most visits, the list of the 500 websites for each country with the most traffic was obtained from the website www.alexa.com (Alexa Internet, Inc. 2017) and then it was browsed in search for news websites that complied with the above-mentioned guidelines. The articles in the corpus had to be published between January 1st, 2010 and December 31st, 2015 since it was considered that a six-year span was long enough to attenuate the effects of news trends. With all these criteria in place, the next step was to scrap the articles. The most used procedure for scraping the articles was the following:

a. Perform an advanced search with Google on the website, using its commands to filter opinion articles from general news and then use keywords *hidroeléctrico, hidroeléctrica, hidroeléctricas* or *hidroeléctric*.*
b. When the search results page is displayed, use the Data Miner Extension for Google Chrome to scrap all the URLs and create a spreadsheet with them in the first column.
c. After inspecting one of the webpages in the spreadsheet from (b), write a script with Data Miner and the appropriate *XPath* queries (Refsnes Data 2017), for scraping from each webpage the following information: Title, author, date, and full text.
d. Apply the script and the tool for scraping multiple pages of Data Miner to the spreadsheet from (b) to retrieve all the specified data and then paste it back in the said spreadsheet and adding to the spreadsheet two more columns, one indicating the name of the news medium and other the country of publication.
e. Browse the spreadsheet created in search of any articles that do not fit into the guidelines or any other easily recognizable mistake.

**Results**

| **Guatemala** | | | **Colombia** | | |
|---|---|---|---|---|---|
| **News medium** | **Type** | **No. of articles** | **News medium** | **Type** | **No. of articles** |
| Contrapoder | Magazine | 4 | Dinero | Magazine | 8 |
| El Quetzalteco | Newspaper | 5 | El Colombiano | Newspaper | 13 |
| elPeriódico | Newspaper | 41 | El Espectador | Newspaper | 60 |
| La Hora | Newspaper | 12 | El Heraldo | Newspaper | 17 |
| La Nación | Online | 11 | El País | Newspaper | 19 |
| Plaza Pública | Online | 50 | El Tiempo | Newspaper | 44 |
| Prensa Libre | Newspaper | 82 | El Universal | Newspaper | 10 |
| RepúblicaGT | Online | 39 | Kienyke | Online | 17 |
| Siglo 21 | Newspaper | 18 | La Patria | Newspaper | 33 |
| | | | La República | Newspaper | 4 |
| | | | La Silla Vacía | Online | 10 |
| | | | Las 2 Orillas | Online | 40 |
| | | | Publimetro | Newspaper | 1 |
| | | | Pulzo | Online | 1 |
| | | | Semana | Magazine | 26 |
| **Total – Guatemala** | | **262** | **Total – Colombia** | | **303** |
| **Total** | | | | | **565** |

**Table 2. Number of articles included in the corpus classified by country and news medium, in alphabetical order. Source: Prepared by the author with data from the corpus.**

The corpus, as Table 2 shows, consisted of 565 opinion articles, 262 from Guatemala and 303 from Colombia. It was pre-processed using RapidMiner (RapidMiner GmbH 2017) and QDAMiner to prepare it for textual analysis and then minor corrections on the texts were manually made. Table 3 shows the basic lexicographic characteristics of the corpus.

| Corpus | w-tokens N | w-types V | hapax H | texts T | mean tokens | min tokens | max tokens |
|---|---|---|---|---|---|---|---|
| **Colombia** | 219172 | 20203 | 10162 | 303 | 723.33 | 197 | 4413 |
| **Guatemala** | 177894 | 18067 | 9438 | 262 | 678.98 | 283 | 4912 |
| **Total** | **397066** | **28798** | **13888** | **565** | **702.77** | **197** | **4912** |

**Table 3. Basic lexicographic characteristics of the corpus. Prepared by the author with data from the corpus.**

Regarding the dates of the articles, there was a larger amount of texts from 2014 and 2015 in comparison to the 2010-2013 period. This tendency was both in the general corpus and in the sub-corpora by country. Figure 2 shows the articles published by year for both countries in the 2010-2015 period. The difference between the first years and the last two cannot be attributed to a surge in the interest in the subject of hydroelectricity, but as a rapid inquiry showed, the most probable cause was that most news websites surveyed don't keep their online news archives complete and updated (not even under subscription access).

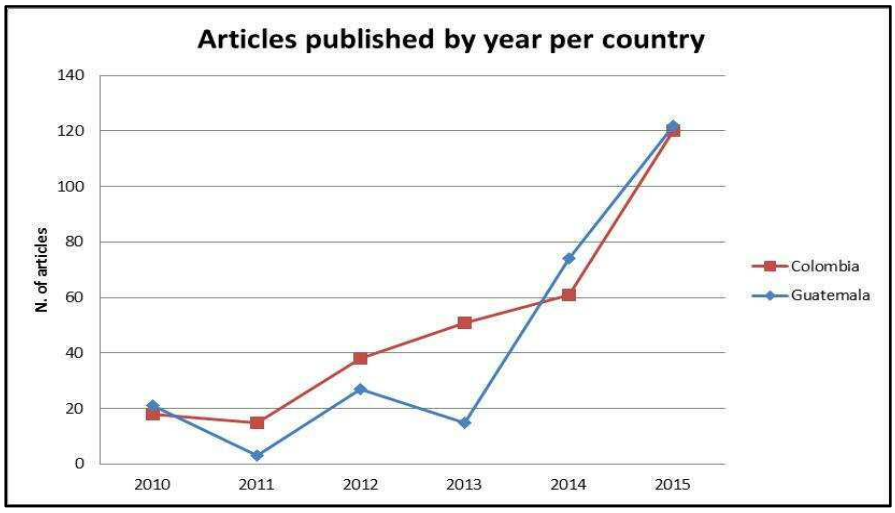


**Figure 1. Articles published by year per country. Prepared by the author, with data from the corpus.**

The first stage of the text analysis involved using the "bag of words" approach (Tuzzi 2010) in order to describe the corpus. In this model, the unit of analysis is a single word, in the sense that it is a collection of characters that have a meaning in the language of the text and that is separated from others by a space or other symbol. In fact, it can be called a "textual unit" (Tuzzi 2003). This approach doesn't need to take into account the order in which the words are arranged when analysing a text, and consequently, the grammar and syntax employed; hence, the name "bag of words". In particular, word-vectors (Tuzzi 2010) were created using term occurrence, binary term occurrence, term frequency and TFIDF (Term Frequency / Inverse document frequency), (Delen 2012). Then, these word-vectorswere used in order to apply more complex methods, such as correspondence analysis (Benzécri 1992) and network mapping (Venturini 2012). The software used to perform these exploratory analyses was QDAMiner (Provalis Research 2017), for correspondence

analysis, and CorTexT Manager (Institut National de la Recherche Agronomique 2017), for network mapping.

| Colombia | | Guatemala | |
|---|---|---|---|
| **Word** | **Distance to the origin** | **Word** | **Distance to the origin** |
| Región | 2.759 | Derechos | -1.886 |
| Proyecto | 2.109 | Población | -1.77 |
| Ambiental | 2.076 | Seguridad | -1.689 |
| Río | 2.031 | Sociales | -1.615 |
| Sector | 1.905 | Vida | -1.471 |
| Millones | 1.857 | Caso | -1.391 |
| Generación | 1.727 | Intereses | -1.386 |
| Producción | 1.662 | Poder | -1.31 |
| Energía | 1.292 | Hidroeléctricas | -1.297 |
| Proceso | 1.23 | Derecho | -1.286 |
| Agua | 1.181 | Personas | -1.281 |
| Frente | 1.065 | Social | -1.253 |
| Nacional | 1.028 | Ley | -1.219 |
| Año | 0.901 | Forma | -1.216 |
| Ambiente | 0.885 | Ver | -1.216 |
| Cambio | 0.836 | Naturales | -1.211 |
| Inversión | 0.83 | Público | -1.042 |
| Construcción | 0.802 | Sistema | -1.023 |
| Empresa | 0.74 | Mayoría | -0.993 |
| Grandes | 0.722 | Comunidades | -0.857 |

**Table 4. Top 20 words for each country in terms of distance to the origin, according to correspondence analysis made with the 100 words with the highest frequency. (Prepared by the author with data from the corpus. Software: QDAMiner)**

The first analysis performed was a correspondence analysis in order to determine which words associated strongly with each country. Words that would have obvious strong associations (like *Guatemala, Colombia, guatemalteco, colombiano*, etc., and other names of geographical locations) were removed from the corpus, since their presence in a contingency matrix would definitely increase their distances and affect the resulting graph. Since there were only two categories, the correspondence analysis did not produce a two-dimensional graph, but rather a one-dimensional continuum in one axis. Instead of the graphic result, Table 4 shows the words which were the furthest from the origin according to the correspondence analysis performed to the 100 words with the highest frequency in the corpus. The ones with negative magnitudes were associated with Guatemala, while the ones with positive ones with Colombia. The list of terms associated with Colombia included: *proyecto* (project), *ambiental* (environmental), *millones* (millions), *generación* (generation), *producción* (production), *proceso* (process), *inversión* (investment), *construcción* (construction), *empresa* (company) and *change* (cambio). These terms, and others on the list fit the argumentative that advocates for hard energy paths (Devine-Wright 2007; Brondi et al. 2014) that was discussed above. On the other hand, the list of terms for Guatemala included: *derechos* (rights), *población* (population or town), *seguridad* (security), *social*

(social), *vida* (life), *intereses* (interests), *mayoría* (majority), *comunidades* (communities), *público* (public), which also fits Devine-Wright's soft-energy-path's argumentative lines.

If this analysis is repeated with phrases, the results still mirror those obtained with single word-types. The correspondence analysis over one axis included all those phrases (n-grams) up to 4 words with frequencies larger than 25 on the corpus. The list of the 10 phrases with the largest distance to the origin for each country is presented in Table 5.

In this table, negative values were associated with Colombia and positive ones with Guatemala. As it can be seen, the type of phrases on the Colombia list fitted again in a hard-path argumentative: *billones de pesos* (billions of *pesos*, Colombia's currency), *cargo por confiabilidad* (a surcharge in the Colombian electrical system for guaranteeing the electricity supply), *gobierno nacional* (national government), *licencia ambiental* (environmental permit), *energías renovables* (renewable energies) and *millones de dólares* (millions of dollars). These phrases emphasize the role of hydroelectricity in the national context, as a strategic asset against threats like the *El Niño* Phenomenon (*Fenómeno del Niño*) or global warming (*calentamiento global*), which were also on the list.

| Colombia | | Guatemala | |
|---|---|---|---|
| **Phrase** | **Distance to the origin** | **Phrase** | **Distance to the origin** |
| Billones_de_pesos | -1.384 | Ministerio_público | 1.969 |
| Cargo_por_confiabilidad | -1.384 | Derechos_humanos | 1.491 |
| Fenómeno_del_niño | -1.384 | Pueblos_indígenas | 1.354 |
| Gobierno_nacional | -1.384 | Proyectos_hidroeléctricos | 0.926 |
| Licencia_ambiental | -1.384 | Medios_de_comunicación | 0.869 |
| Gas_natural | -1.133 | Comunidades_afectadas | 0.839 |
| Calentamiento_global | -1.014 | Conflicto_armado | 0.759 |
| Central_hidroeléctrica | -0.978 | Construcción_de_la_hidroeléctrica | 0.587 |
| Millones_de_dólares | -0.944 | Banco_mundial | 0.523 |
| Energías_renovables | -0.763 | Energía_eléctrica | 0.376 |

**Table 5. 10 top phrases for each country in terms of their distance to the origin, after performing correspondence analysis to phrases with frequency larger than 25. Prepared by the author, using QDA Miner software, with data from the corpus.**

On the other hand, the phrases on Guatemala's list gravitated more around the idea of a participatory (yet conflictive) vision of energy transitions, as it is the matter of fact for soft paths. The most distant were social or judiciary terms: *ministerio público* (Guatemala's prosecutorial office) and *derechos humanos* (human rights). The next terms were also on the social realm, not on the technical: *pueblos indígenas* (indigenous peoples), *medios de comunicación* (communication media), *comunidades afectadas* (affected communities) and *conflicto armado* (armed conflict).

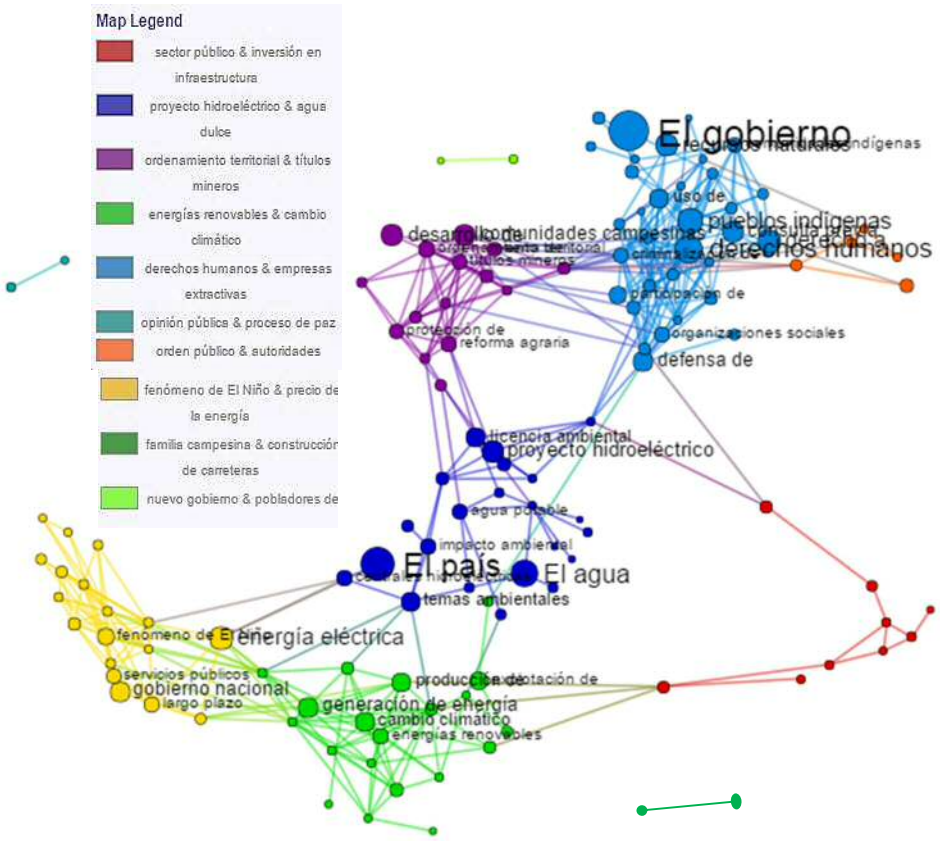


**Figure 2. Network map of the general corpus with the extracted terms as nodes, and the resulting 10 clusters, shown here with different-color nodes. (Prepared by the author with data from the corpus. Software: CorTexT Manager)**

A second analysis on the country level of the corpus was performed using CorTexT Manager (Institut National de la Recherche Agronomique 2017), which is a cloud-based web application developed by the Interdisciplinary Laboratory on Science, Innovation and Society of the French National Institute for Agricultural Research. This web application can produce network maps based on term-extraction and word-vector algorithms. First, a list of 300 extracted terms (n-grams up to four words) was created, and then manually refined and filtered. This new list was used as an index for the general corpus, which in turn was used to create a network map of these terms, taking as base the co-occurrences in all the texts. In addition to the map, CorTexT Manager produced a partition in clusters that were automatically tagged according to the most central terms in each of them. The resulting network map is presented in Figure 3, together with the clusters that were generated. As their translations show (Table 6), most of the topics represented by each cluster were relevant thematic areas related to hydroelectric energy. The last three topics were the ones that seem least related to the subject of hydroelectric development, a fact that fits the network map, since those were the three isolated clusters in Figure 3.

| Spanish term | Translation |
|---|---|
| *Ordenamiento territorial & títulos mineros* | spatial planning & mining charters |
| *Fenómeno del Niño & precio de la energía* | *El Niño* phenomenon & energy Price |
| *Energías renovables & cambio climático* | renewable energies & climate change |
| *Derechos humanos & empresas extractivas* | human rights & extractive corporations |
| *Sector público & inversión en infraestructura* | public sector & investment in infrastructure |
| *Proyecto hidroeléctrico & agua dulce* | hydroelectric project & freshwater |
| *Orden público & autoridades comunitarias* | public order & community authorities |
| *Familia campesina & construcción de carreteras* | peasant family & construction of highways |
| *Nuevo gobierno & pobladores* | new government & settlers |
| *Opinión pública & proceso de paz* | public opinion & peace process |

**Table 6. Spanish names of the clusters generated with CorTexT Manager and their translations. (Prepared by the author with data from the corpus. Software: CorTexT Manager).**

CorTexT Manager allows combining the network map with a heat map in the background that shows the proximity of the clusters to one specific category of a selected variable, which in the case of this study was "country". Figure 4 shows the resulting network and heat map for the category "Guatemala" of the "country" variable, using as metrics Chi-Square. The redder the area, the closer the cluster was to "Guatemala", while the bluer the area, the further the cluster was from "Guatemala". Since this was a dichotomous variable, the blue areas could be interpreted to be associated with Colombia. As Figure 4 shows, the clusters most associated with Guatemala were the ones in the top-right corner, which are labeled *Derechos humanos & empresas extractivas* (human rights and extractive corporations) and *Orden público & autoridades comunitarias* (public order and community authorities).

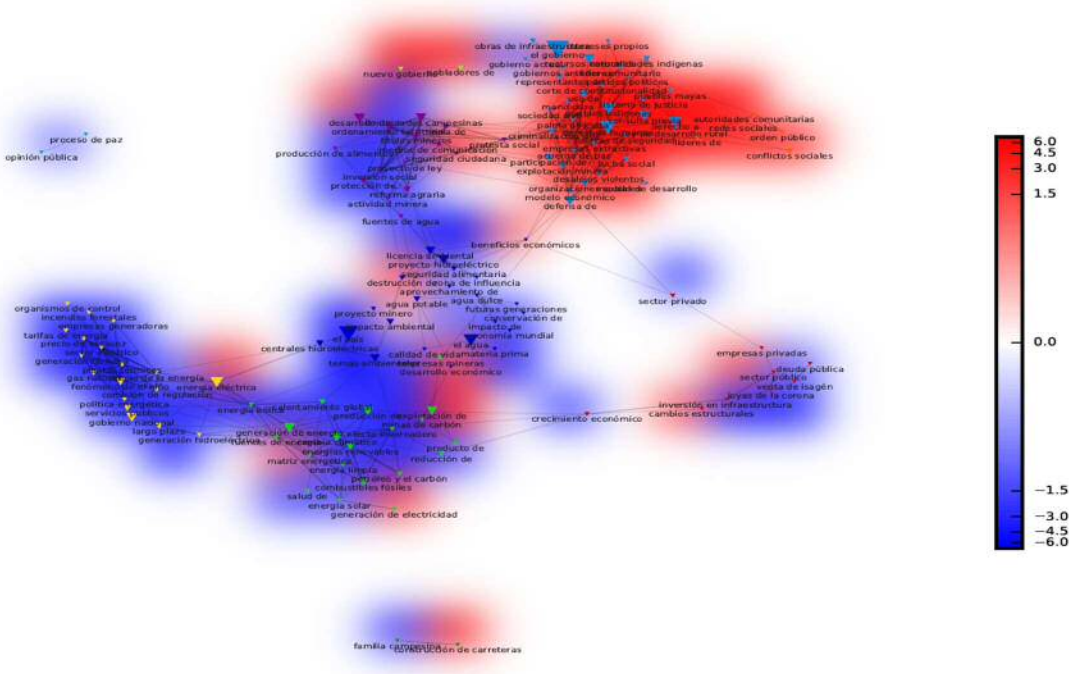


**Figure 3. Network and heat map combined for the clusters formed by terms in the corpus. The heat map shows their proximity (red areas) or remoteness (blue areas) to the category "Guatemala", from the "Country" variable. (Prepared by the author with data from the corpus. Software: CorTexT Manager).**

This last evidence adds up to the previous analyses supporting the fact that the representation in mainstream media was different in each country. The two clusters associated with Guatemala were also the ones with topics associated with conflictive situations, as they included as principal terms “public order”, “violent evictions” and “community authorities”. Of special interest was the term “extractive companies” which also supported the representation of the hydroelectric industry as part of a larger extractive complex, a matter that is part of the research question and objectives of this inquiry.

On the other hand, the blue clusters in Figure 4 could reasonably be associated with Colombia. The section of the network map that has the bluest clusters is the bottom-left; although that color seems predominant in the entire map, with the exception of the top-right. When the comparison was made with Figure 3, it could be seen that the clusters more associated with Colombia were: *Proyecto hidroeléctrico & agua dulce* (hydroelectric project and freshwater); *Fenómeno del Niño & precio de la energía* (*El Niño* phenomenon and energy price); and, *Energías renovables & cambio climático* (renewable energies and climate change). There were other clusters that were predominantly associated with Colombia, and at the same time mildly associated with Guatemala, like *Ordenamiento territorial & títulos mineros* (spatial planning and mining charters) and *Sector público & inversión en infraestructura* (public sector and investment in infrastructure). Once again, the topics or clusters associated with Colombia pointed out to a representation of hydroelectricity as part of a national project of infrastructure; or as part of the renewable energy mix that is a strategic asset against natural threats as climate change; or as a an economic asset threatened by *El Niño* phenomenon. Any of these cases fitted into the hard-path narrative of energy transitions. The heat map also shows that while the Guatemalan sub-corpus concentrated in a few topics related with a representation of hydroelectricity as a contested industry, the Colombian sub-corpus covered a wider range of topics, all connected, however, to the representation of hydroelectricity as a national strategic asset.

**Conclusions**

The previous analyses show that there is a significant difference between the media representations of the hydroelectric generation industry in Guatemala and Colombia. First, correspondence analysis shows that the representations in Colombia are more kin to the previously discussed hard-path argumentative, while those in Guatemala are closer to soft-path representations of energy transitions. Second, network mapping confirms the previous results, and also adds evidence to support the hypothesis of the representation of hydroelectricity as a part in an all-encompassing large extractive complex, since the combination of the heat map and network map shows that Guatemalan opinion articles are

more strongly associated with clusters tagged with extractivist companies and mining. Network mapping also provides evidence that in Colombia, media representations are spread over different topics, which can be accounted as cognitive polyphasia (Jovchelovitch 2002), while in Guatemala representations are more concentrated around topics of conflict and negotiation. Finally, this study adds up to previous research that shows how software-assisted content analysis of texts has the potential of offering meaningful conclusions about medium and large corpora of text, complementing qualitative content analysis and even pointing to novel directions to explore.

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