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## Indigenous imaginaries about climate variability and local adaptation

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**Abstract:** Climate variability is a highly disruptive phenomenon of daily life in rural communities due to social, infrastructural and economic factors. Although studies on the effects of climate variability are numerous, the novelty of the one presented here lies in transcending the economic dimension, addressing the nature-community-tradition relationship and delving into the symbolic aspects of adaptation. The objective of the study was to explore the imaginary of the *Coreguaje* people on climate variability and adaptation. The methodology used was qualitative with a hermeneutic design approach based on intensive fieldwork, transcription of interviews and triangulation. The results of the study showed three main themes in which the imaginary of the *Coreguaje* people can be represented. These themes were characterized by a strong rupture between past and present, the impact of climate instability on the organization of daily life, the progressive loss of ancestral values and knowledge, as well as an increasingly complex transfer of the *Coreguaje* heritage to the new generations. In addition, it was found that climate variability has put the sedentary way of life of the community at risk, has undermined its autonomy and food security, has promoted limited transformations and adaptations, and has made it difficult to relate to new external factors caused by the settlement of colonists and the introduction of new worldviews. The findings validate the importance of supporting rural communities without undermining their traditions and point to the need to implement alternatives to strengthen community resilience in the *Resguardo* studied.

**Keywords (in English):** climate change, climate variability, community resilience, hermeneutics, social imaginaries.

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### 1. Introduction

The effects of climate change are observable worldwide, but specialized studies highlight its impact on the Global South, especially in rural regions [1]. One of the main consequences in terms of ecosystem effects is climate variability, a phenomenon that mainly affects farmers and rural communities with a

subsistence economy [2, 3]. This is due to numerous factors, including poor adaptive capacity; difficulty in accessing quality services, such as health and education [4, 5]; limited technological integration and poor infrastructure [6, 7]; and the complex coexistence with different production models, especially extractivist and extensive livestock farming, among others [8, 9]. It

should also be taken into consideration that in these environments, land ownership and governance are often associated with historical conflicts, colonial occupations, and subjugation to foreign capital [10, 11].

In this context, climate variability complicates the relationship of communities with their environment [12, 13]. In addition to issues such as soil deterioration and decreased productivity, loss of biodiversity, and challenges associated with food security, these communities must face increasingly unpredictable climatic conditions that contradict their ancestral knowledge [14, 15]. Although a significant part of the studies consulted focus their efforts on understanding or determining the economic impact of climate variability, this phenomenon has also been approached from the perspective of adaptation to their effects [16].

Two fundamental categories are adaptation and resilience, which, although they may appear together or embedded, make it possible to represent the efforts to adapt to these changing conditions, as well as the nature of coexistence concerning the external factors that are inserted into the ecosystem dynamics [17, 18]. The literature points fundamentally to the accumulation processes, the forced importation of technocratic and market-oriented models, and the new worldviews that emerge from them [19].

In this regard, resilience has been defined in various ways in the field of climate variability and specifically in social-ecological systems. Among the definitions, those associated with resilience stand out as a property of the system that indicates the rate of disruption that originates the movement from one state of stability to another, which facilitates the understanding of the process, as well as of the adaptive behaviors of its components until equilibrium is achieved [20, 21]. In the case of socioecological systems, where human beings play a fundamental role in the regulation of the system and adaptation to change, culture and ancestral knowledge play a central part in the conception of transformation to achieve the desired future [22-24]. This process must occur through the abovementioned adaptation or anticipation strategies [25].

To achieve a better understanding of how rural communities, especially Indigenous communities, represent climate change and, specifically, the effects of climate variability on their lives, it is necessary to delve into the constructed and emerging imaginaries [6, 26]. In these symbolic structures, relatively stable visions of the past converge with visions of the future based on new social orders or the recovery of old ways of life [27]. In addition, identity constructions, life plans, and the complex relationship between crystallized knowledge and information are fused in them [28].

In Colombian indigenous rural communities, these representations are often anchored to land, peace, traditions, crops, and the impacts of conflict, so they

also influence resilience to climatic and non-climatic factors [29-31]. In the case of the *Coreguaje* people, it is also found in their mixed style between a sedentary lifestyle and the following of itinerant routes in search of work, coexistence with settlers, and the establishment of markedly extractivist production models in their territory [32].

Despite various governmental and non-governmental initiatives, aid provided by European Union projects, and local adaptation measures, the *Coreguaje* people still need to transform the context for adaptation. Thus, it is assumed that an approach to the shared perspectives on climate variability, the evolution of social practices of daily life, the way they perceive their coping, and the mechanisms they have developed to adapt, will facilitate the design of policies and support mechanisms for these communities. Consequently, the objective of the research was to explore the imaginary of the *Coreguaje* people about climate variability and their adaptation to it.

Thus, this research is expected to contribute to the knowledge system related to climate variability, associated imaginaries, and adaptation mechanisms of indigenous rural communities. Through an inductive, observational, and empowering approach, the representation of these categories from the perspective of the *Coreguaje* people can significantly contribute to the consolidation of previous contributions, support the development of integrated adaptation mechanisms, and make visible adaptation strategies where ancestral knowledge systems and new socio-technical trends integrate complex imaginaries.

## 2. Material and methods

The Getuchá Indigenous *Resguardo* was defined as the context of the research, which is located in the municipality of Milan, department of Caquetá. This ethnic community belongs to the *Coreguaje* people. The research was developed from a historical hermeneutic approach, based on the interpretation of the texts to delve into the meanings constructed by the participants, identified through gatekeepers and with greater proximity to the adult population.

Furthermore, researchers maintained an open position towards interpretation, connected to fieldwork and the triangulation of findings within the database (transcriptions) and in relation to external data sources. In this sense, discussions between researchers, field notes and relevant texts from the literature were used as auxiliary resources. For this, the following research question was stated:

What elements of meaning characterize the imaginaries of the *Coreguaje* people about climate variability?

The research was carried out in a system of stages connected by the hermeneutic circle with each other and concerning the triangulation procedure (figure 1) [33, 34]. In the first stage, immersion, emphasis was placed on data collection through observation, note-

taking, and in-depth interviews to gain an adequate initial understanding of the *Coreguaje* conception of climate variability. In the second stage, all available textual data were coded to deepen the understanding of climate variability's effects on past and future life. In the third stage, abstraction occurred, and the main categories were constructed, as indicated in capital letters in the meaning matrices. Finally, in the last stage, the authors developed the main themes and a synthesis of the global representation of the *Coreguaje* people on climate variability.

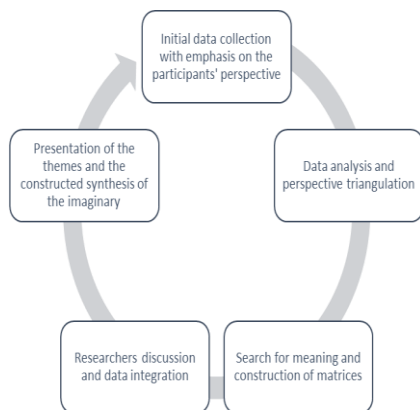


Figure 1. Hermeneutic circle. Source: the authors.

### 3. Results

#### 3.1. Findings of the initial approach

The initial observation and semi-structured interviews revealed that the Getuchá *Resguardo* has 147.17 hectares of land, inhabited by 33 families, although in an itinerant manner. This hybrid housing style has been caused by the scarcity of resources and the limited environmental supply, so the *Coreguajes* need to move seasonally to work as day laborers in other communities and nearby localities. However, despite this situation, of having been trapped in the conflict and violence generated by the presence of illegal armed groups, as well as facing the dispute over the territory for the drug trafficking business, the *Coreguajes* have managed to stay in their territory through processes of strengthening community resilience.

Regarding the activities they carry out, it was found that they are mainly hunting, fishing, and agriculture, although, according to community leaders, with a different intensity than in the past. Interviews revealed that this is due to the arrival of a considerable population of settlers to these lands, with the subsequent establishment of coca crops and the introduction of extensive cattle ranching models. As a result, the *Coreguaje* people have witnessed a considerable and progressive decrease in food supply. Observation and interviews indicated that the subsistence activities of the indigenous people have also been modified, leading to sedentarization and a productive system of private property and individual work, contrary to the ancestral worldview of the

*Coreguaje* people and their different forms of collectivism.

When exploring the decision-making processes and the government structure, researchers observed that the political organization corresponds to the *cacicazgo*. This structure obeys the will of the community, so this social responsibility is designated by consensus and election among the community. The *Cacique's* responsibilities include organizing and directing the collective's activities, as well as representing the community in state activities or before other social actors. There is also a *Cabildo* as a complementary government structure, composed of community leaders and elders, who are responsible for ensuring the security of the *Resguardo* and identifying the community's primary needs in order to address them.

#### 3.2. Climate change and variability: consequences and first mentions

Initially it was observed that the deforestation of the areas surrounding the *Resguardo* was evident even at first glance. Upon interviewing the leaders, it was learned that, in addition to the causes attributed by them to the climate, these high rates are also due to the planting of crops for illicit use and pasture, which has caused many species of flora and fauna to be lost or die. Among the explanations generated by the interviewees was that the available sites for the species are narrower and do not facilitate reproduction. This, together with the limited territory of the *Resguardo*, has resulted in a limited supply of biodiversity for the self-sufficiency of the communities, which means that central activities such as hunting and fruit gathering are increasingly restricted.

As for the categories climate change and climate variability, both appear linked in the ecosystemic representation of the *Coreguaje* people. First, the locals perceive that the situation of scarcity is especially acute because, although the supply of biodiversity is limited in itself, the cycles of species have been affected by climate uncertainty. In the opinion of those interviewed, this quality of the climate interrupts the dynamics of the populations, as well as planting and river levels for another of their traditional activities, in this case, fishing.

In line with what the *Coreguajes* call "uncertainty" or "uncertain" of the climate, the components of the concept of climate variability were identified, especially those related to temporal deviations according to specific periods of time that were outlined or related in ancestral traditions. Although it was found that these records were not detailed in terms of averages, they did reflect the main characteristics of the climate and its progressive "deterioration" mainly in matters intrinsic to the daily life of the community. Based on this approach and the construction of the problem by the key participants, we proceeded to delve deeper into the imaginaries constructed about these

climate deviations and the efforts of the *Coreguaje* people to develop adaptation strategies (figure 2).

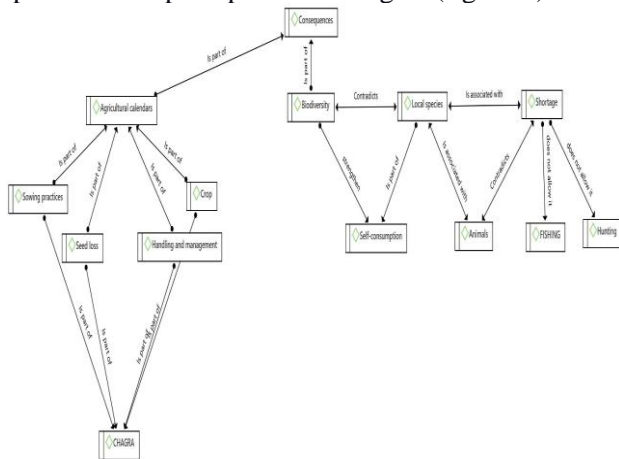


Figure 2. Consequences of climate variability on the representation of the *Coreguaje* people. Source: ATLAS.ti.

### 3.3. *Coreguaje* people's imaginary about climate variability: general elements

The narratives of the *Coreguaje* world about climate were associated with words such as "today", "now", "crazy", "different", "varied" and "changed", so it is clear that the Indigenous community participating in the study perceived a variation in the climate, about before and now, with emphasis on the seasons of the region (summer and winter). Similarly, codes such as "river", "summer", "rain", "winter", as well as denominations related to their crops, sowing calendars, harvesting activities and *chagra* management practices, emerged. The affective tone was generally negative, and the textuality was directed towards the consequences of these deviations in *Resguardo's* daily life, suggesting that the constructed imaginaries are based on the temporal dimension and the daily activities dimension.

In a deeper analysis of the narratives of the study participants, quotes of interest were identified, and 87 codes were obtained. The composite code Climate-Variability was the one with the highest co-occurrence as it was related in 42 text fragments with respect to the other 87. Climate variability is understood by the *Coreguajes* as the presence of greater and more intense rainfall. For them, the weather is now uncertain since there are no longer defined months for rain or summer, a central aspect in their perception of normality. Similarly, they expressed that, although there is more rainfall and it is more intense, it feels much hotter than before. In addition, the narratives pointed to ideas similar to that of the following verbalization: "A heavy downpour may have just passed, and the sun is shining and/or vice versa." This suggests that the rain-sun relationship is slightly misunderstood and strange, especially when contrasted with respect to ancestral records and knowledge.

Likewise, the indigenous people consider that nowadays, summers, although shorter, are stronger because they are perceived as hotter. In this way, rains and summers are defined as brief in the representation

of the seasons, but they are described as more intense and with worse consequences, including more floods and more droughts. Finally, it was observed that, in relation to past times, represented as ancient in the language, these are associated with certainty and security. Regarding the present, this is perceived as a period of lack of control and imbalance, marked by extremes and the cause of sorrows in the life of the countryman, which they qualify as "full of uncertainties".

In summary, according to the participants, there is high climate variability, which implies more intense rainfall, more significant flooding and catastrophes, as well as shorter but more intense periods of drought. In the general representation of climate variability in relation to the *Coreguaje* people, this translates into impacts on ways of life and relationships for production, both human and non-human, an element that runs through the emerging imaginary about climate (figure 3).

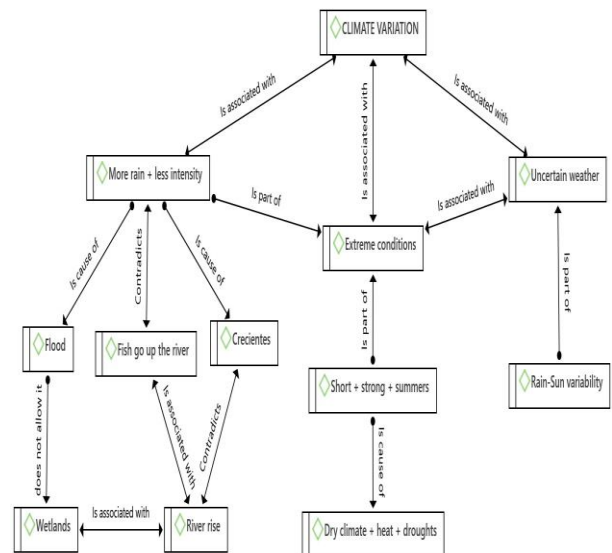


Figure 3. General representation of climate variability. Source: ATLAS.ti.

### 3.4. Effects of climate variability on ancestral practices and the *Coreguaje* worldview

#### a) Fishing

According to the interviews, the *Coreguajes* were traditionally hunters, fishermen, and gatherers. The sources of protein they consumed came mainly from fish and bush animals, which has changed as biodiversity and the presence of species that used to be part of the *Coreguajes'* staple diet have decreased.

Traditionally, the time for fishing was in the summer because the river grew, which they call "subienda", which is the phenomenon by which the fish take advantage of the decrease in river flow to move from the lower parts to the upper parts in search of deeper bodies of water, where they mate and survive. This displacement was used for fishing and was clearly marked in the calendars of the *Coreguaje* people.



However, according to those interviewed, this is almost never the case today because the river remains full or flooded for most of the year. In addition, it was found that the rise and fall cycle does not follow the traditional calendars but is abrupt in both cases and affects fish reproduction. This limits access to one of the main sources of protein for the *Coreguajes*.

Similarly, community leaders recall that there were up to four wetlands or river rises during the year. These phenomena occurred between April, July, and October, lasted up to 15 days, and favored the hunting of *babillas* (*Caiman crocodilus*), a practice that is now in disuse. On the other hand, the forest or wetland tomb that has been generated, where *aguaje* or *canangucha* palms (*Mauritia flexuosa*) predominate, meant that fish such as bocachico (*Prochilodus magdalenae*) and coroncoro (*Hemiancistrus wilsoni*) did not return to the ancestral fishing lagoons, a key site for fishing in the *Resguardo*. This situation has generated diverse adaptations, mainly related to a greater dependence on agriculture, but has also been represented as a threat of "hunger and death" (Figure 4).

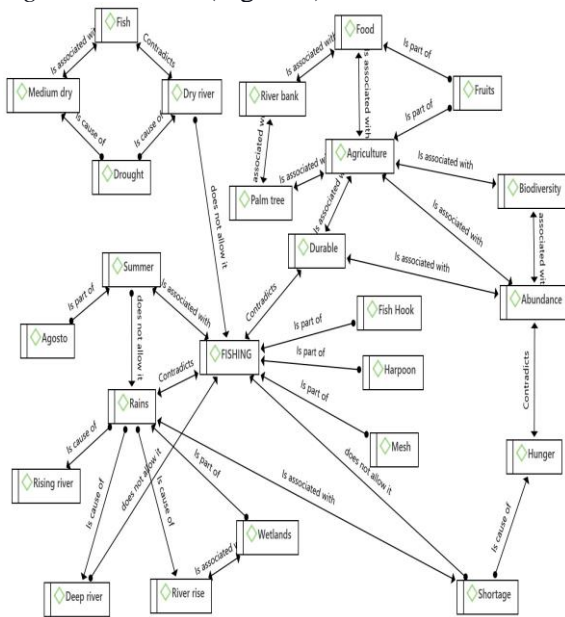


Figure 4. Adaptation mechanisms generated in fisheries. Source: ATLAS.ti.

**b) Hunting**

In the *Coreguaje* ancestral imaginary, hunting, the moon, and summer are "accomplices to go hunting." However, this activity is less and less practiced or is practiced with significant restrictions due to the decreasing number of species available for hunting and the decrease of the places where the animals used to feed and places used for hunting. Among the reasons attributed by the *Coreguajes*, the disappearance of the trees that gave seeds and created these sites or the decrease of the seeds because the heavy rains cause the fall of the flower stands out.

Although traditionally, this had been at risk in its first stage, nowadays, the second laying is also at risk due to the river's abrupt and out-of-period ascents. According to the *Coreguajes'* narratives, this is an

increasingly common scenario for the region's indigenous communities, as it directly impacts their food security.

**3.5. Land and spirituality put in tension by climate variability: The *Chagra* and daily life**

The *chagra* serves a dual function in the life of the *Coreguaje* people and represents a fundamental sociocultural space in their narratives and practices. In the first place, the *chagra* represents a unique way of understanding the land, a central element in the *Coreguaje* imaginary, as it is objectively produced as land for cultivation, but at the same time reflects the values and moral principles that the *Coreguaje* have traditionally defended, so that socioculturally the *chagra* is produced as a form of collectivism, self-support, and integration to the natural calendars (Figure 5).

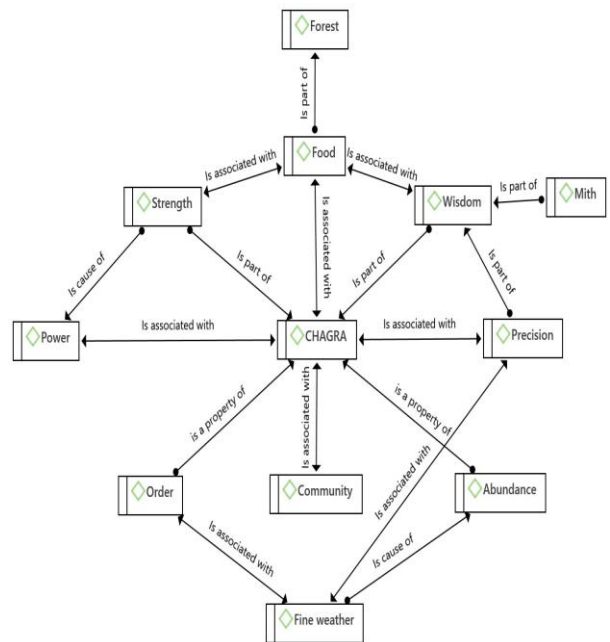


Figure 5. *Chagra* significance for the *Coreguaje* people. Source: ATLAS.ti.

Secondly, the *chagra* is a socioculturally constructed knowledge and value transfer form. In it, with cultivation and union with nature as fundamental motives, the *Coreguajes* have transmitted their vision of the world from one generation to the next, while at the same time functioning as an autochthonous barrier in the face of changes, no longer climatic but cultural. This last issue was a recurrent element, as it represented the convergence of cultural, ecosystemic and climate changes in the life of the *Coreguajes*.

With respect to climate variability, the *chagra* as farmland has been affected. In the narratives of the research participants, this was evidenced in the dichotomy between the ancestral agricultural calendar and the behavior of the current climate. According to them, the climate used to allow them to plan the planting, use, management, and exploitation of the crop, while at present, this needs to be fully complied with. The main consequence perceived by the *Coreguajes* is the impossibility of respecting the

guidelines of their ancestral calendars and agrarian rituals since they must work when the weather permits, which affects the quality of the soil and its productivity.

Similarly, the intense summers and heat waves cause the sun's rays to affect fruit trees, vegetables, and other staple crops of the *chagra*. Another change generated by climate variability is the weak rain-sun seasonality, which causes a considerable increase in humidity. The *Coreguajes* describe the consequences of this increase as soggy or damaged vegetables and the loss of fruit on the trees due to this climate.

In addition, climate variability has affected agricultural calendars regarding timing and land preparation for planting. This is due to what participants described as the absence of summer, a period when the *Coreguajes* carried soil burning. In addition to these conditions, the increasingly common low soil quality, whose hardness and temperature they highlighted, has considerably impacted seed germination. Similarly, the *Coreguajes* describe how the "strong sun rays" burn the flowers, thus decreasing the possibility of obtaining quality fruit. This consequence of climate variability causes the fruit trees to ripen prematurely and produce dry, futile, and tasteless fruit.

Regarding the sociocultural dimension of the *chagra* and its relationship with climate change, it should be noted that the centrality of the *chagra* gave it a crucial regulatory value in *Coreguaje* life, even when it was not related to cultivation activities. A particular example highlighted by the *Resguardo* leaders was the organization of fishing and hunting. In the past, these activities were guided by the *yagé*-taking shamans, who decided whether or not they could go out to perform these practices. Today, individuals go fishing or hunting at any time, contravening ancestral practices and the values of the *Coreguaje* people.

Climate variability has changed the lives of the peasant, even in their daily organization, as they used to work the land from around eight in the morning until four in the afternoon. Nowadays, they work from about six in the morning, with a maximum extension of ten in the morning. Another adaptation is incorporating the schedule from four to six in the afternoon since the sun is "unbearable" in the remaining hours. Similarly, in the winter season, there are few days when work can be done since the floods last longer and the river covers an important part of the land.

This deviation from traditional practices caused by the climate has impacted community and family life in the *Coreguaje* imaginary. Fundamentally, they highlight the effects of variability in their lifestyles, which is expressed in poorly planned outings or those that do not correspond to family and community dynamics, resulting in a complex disorganization of daily life.

Even at a superficial level in the discourse, one can appreciate how the *Coreguajes* "suffer" from this rupture in the relationship between the people and nature. This rift between ancestral - present constituted a central theme in the analysis and representation of the data, as it shows the loss of the perceived reciprocity between the *Coreguaje* people and the symbolism of the natural without them being able to establish a clear causality.

The results suggest that this intangibility attributed to climate variability affects how the *Coreguaje* represent the affective dimension of their relationship with nature and diminishes their ability to adapt. Even at the level of manual representation of the data, the everyday disorganization is evident when comparing the practices associated with the *chagra* in the past and the present.

In the past (figure 6), the *chagra* responded to a linear climatic and sociocultural logic that facilitated the preparation and ritual richness of the practices. The *Coreguajes* explained this perceived form of linearity regarding milestones or achievements, which somehow allowed them to function in a normality that they strove to protect and which enjoyed a marked affective value. These milestones were organized by the *Coreguajes* according to the seasons and obeyed not only the natural cycles but also the sociocultural interpretation and reproduction of these cycles through activities such as burning the soil, clearing undergrowth, logging, cultivation, hunting, and fishing, among others. This resulted in a "known" daily life where precision was a fundamental value due to the established patterns of individual, family, and community behavior.

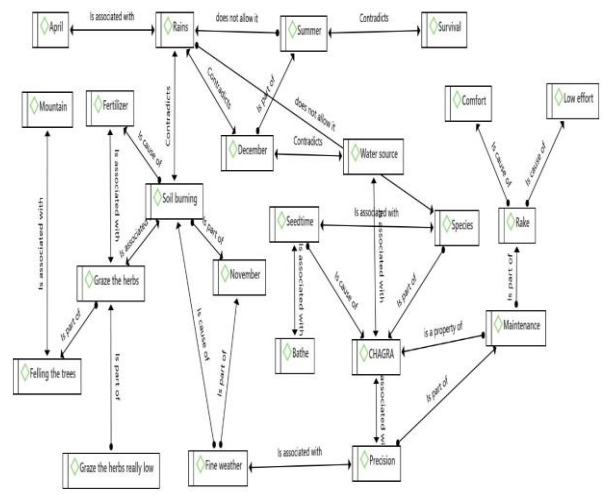


Figure 6. *Chagra* practices in the past.

In the present (Figure 7), this normality has been tremendously affected, as argued above, specifically with regard to guidelines and precision, two institutions of daily life in the *Coreguaje* worldview. In addition, the participants highlighted uncertainty and ignorance as two evils that affect the community, since they are in direct contradiction with its principles, but also because they reflect the inability to adapt effectively.



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