The Bayano dam in Panama, the nonhuman world, and a Relational Values lens: Exploring the region through surveys, workshops, and a comprehensive Stakeholder Table

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 List of abbreviations

ES Ecosystem Services

EST "Enhanced" Stakeholder Table

HHSC Human-Human Social Conflict

HWC Human-Wildlife Conflict

IPATE Impact equation (Impact is a function of Population, Affluence, Technology, and Ethics)

ISPA International Society for the Protection of Animals

PEMASKY Proyecto de Estudio para el Manejo de Areas Silvestres de Kuna Yala (Study Project

for the Management of the Wildlands of Kuna Yala)

**REB** Research Ethics Board

**RV** Relational Value

ST Stakeholder Table

Abstract

The Panamanian Bayano dam, completed in 1976, led to the relocation of Indigenous and non-Indigenous communities and to detrimental environmental changes. While the region has been studied, no explicit Relational Values perspective has been applied. Relational Values focus on relationships, particularly between humans and nonhuman nature, and to the goal of a Good Life, namely one of fulfillment and thriving. Such relationships are key to the Bayano region, as the Indigenous communities have many close relationships with the natural environment. This often includes seeing all beings as part of a community, with reciprocal responsibilities between entities. A Stakeholder Table is one way to display and understand the Bayano stakeholders, including the nonhuman. The overarching objective of this project was to apply a Relational Values lens to the discourse and interconnections tied to the Bayano region, principally achieved through the development of a Relational Values based Stakeholder Table. As such, this thesis consists of a series of sections with a total of seven articles which take the lens of Relational Values, a related concept of Frames (as made up of many relationships) and Parameters (specifically as several Frames coalesce into the four Parameters of the Impact equation). Each section of the project adds insight on potential stakeholders, culminating in the development of the Bayano region Stakeholder Table. The research ranges from direct surveying and workshopping with an Indigenous Embera Bayano community to identify their views on climate, wildlife and their Good Life, to applying the concept of Frames to Bayano. Results from these activities show a clear understanding of biodiversity loss by the Indigenous community and a Good Life that contains educational opportunities. Furthermore, informants saw changes in climate as being mostly "unpredictable." The exploration of Frames, including a "collective writing" project, and an analysis of media reports during and after the dam construction period,

show the cooccurrence of different Frames, including the Conservation and Stewardship Frames. The related concept of Parameters was discussed in 14 workshops with relevant stakeholders to develop a Human-Wildlife Conflict Impact equation, which aided in identifying relevant stakeholders for Bayano and beyond. The importance of Ethics and Education as Parameters are key results. There were also 14 workshops discussing terminology for the nonhuman, as this is key to Relational Values. Results of these workshops demonstrate an emphasis on terms that reduce the human/nonhuman divide. This section of the project also highlights the importance of including several specific stakeholders in the Bayano Stakeholder Table, including spiritual ecosystems, nonhuman animals and emergency services. Finally, by developing and applying the Bayano Stakeholder Table to legal documents and agreements, Hidden Stakeholders and potential synergistic projects are illustrated. In sum, this thesis explores the Bayano region through a variable Relational Values lens and culminates in an analysis of a regional Stakeholder Table. While the region is deeply explored in this way, this project also acts as a case study to apply methodologies elsewhere, particularly in finding Hidden Stakeholders and exploring general relationships between humans and the nonhuman world.

Résumé

Le barrage panaméen de Bayano, complété en 1976, a causé la relocalisation de communautés indigènes et non indigènes et des changements environnementaux néfastes. Bien que la région ait été étudiée, aucune perspective explicite des valeurs relationnelles n'a été appliquée. Les valeurs relationnelles se concentrent sur les relations, en particulier entre les humains et la nature non humaine, et sur l'objectif d'une "Bonne Vie," à savoir une vie d'épanouissantement et de floraison. Ces relations sont essentielles dans la région de Bayano, car les communautés indigènes entretiennent de nombreuses relations étroites avec l'environnement naturel. Cela implique souvent de considérer tous les êtres comme faisant partie d'une communauté, avec des responsabilités réciproques entre les entités. Une "Table des Parties Prenantes" est une façon de présenter/comprendre les parties prenantes de Bayano, incluant les non-humains. L'objectif principal du projet était d'appliquer une perspective de valeurs relationnelles au discours et aux interconnexions liées au Bayano, ce qui a été principalement réalisé par le développement d'une "Table des Parties Prenantes" basée sur les valeurs relationnelles. Ainsi, cette thèse se compose d'une série de sections (sept articles) qui prennent l'objectif des valeurs relationnelles, un concept associé aux Cadres (composé de nombreuses relations) et de Paramètres (spécifiquement plusieurs cadres se regroupant dans les quatre paramètres de l'équation d'impact). Chaque section du projet apporte un éclairage sur les parties prenantes potentielles, pour culminer avec l'élaboration du tableau des parties prenantes de la région de Bayano. Les recherches incluent des enquêtes directes et d'un atelier avec une communauté autochtone Embera Bayano afin d'identifier leurs points de vue sur le climat, la faune/flore et leur "Bonne Vie", ainsi que l'application du concept des Cadres à Bayano. Les résultats de ces activités montrent que la communauté comprend clairement la perte de

biodiversité et que le concept d'une "Bonne Vie" inclut des opportunités éducatives. En outre, les participants considèrent que les changements climatiques sont surtout "imprévisibles". L'exploration des Cadres, y compris un projet d'"écriture collective", et l'analyse des reportages des médias pendant et après la période de construction du barrage Bayano, montrent la cooccurrence de différents Cadres, y compris les Cadres de la Conservation et de la Stewardship. Le concept associé de Paramètres a été discuté dans 14 ateliers avec les parties prenantes concernées afin de développer une équation d'impact du conflit homme-faune, ce qui a permis d'identifier les parties prenantes concernées pour Bayano et au-delà. L'importance de l'éthique et l'éducation comme Paramètres est un résultat clé. 14 ateliers ont également été organisés pour discuter la terminologie relative au non-humain, car elle est essentielle aux valeurs relationnelles. Les résultats de ces ateliers montrent que l'accent est mis sur les termes qui réduisent le clivage humain/non-humain. Cette section du projet souligne également l'importance d'inclure plusieurs parties prenantes spécifiques dans la Table des Parties Prenantes de Bayano, notamment les écosystèmes spirituels, les animaux non humains et les services d'urgence. Enfin, en développant et appliquant le Tableau des Parties Prenantes de Bayano aux documents juridiques, les parties prenantes qui sont souvent ignorées et les projets synergiques potentiels sont illustrés. En résumé, cette thèse explore la région de Bayano à travers un prisme de Valeurs Relationnelles variables et culmine dans l'analyse d'un Tableau des Parties Prenantes régional. Bien que la région soit explorée en profondeur de cette manière, ce projet sert également d'étude de cas pour appliquer les méthodologies ailleurs, en particulier pour trouver les parties prenantes ignorées et explorer les relations générales entre les humains et le monde non-humain.

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I would like to thank my supervisors at Building21, who helped in developing a Childcentered Water Poverty Index report (a figure from that report is used in this thesis with permission). They also aided in publishing the results of the workshop with the Embera community, included here with permission. This research was partially supported by an FRQNT scholarship (2017-2019), graduate excellence awards from the McGill Natural Resource Sciences department (2016-2017), the E4A (Economics for the Anthropocene) (2016-2017) program and the BESS (Biodiversity, Ecosystem Services and Sustainability) program (2016-2020).

Contribution of authors

This dissertation is in a manuscript-based format. I am the sole author of all chapters and articles in this dissertation except for the article in chapter 4, namely "Determining the Views of the Panamanian Indigenous Maje Embera Drua on Environmental and Biodiversity Changes," for which April Lee is a co-author. I collected the data and wrote all sections of the article, except the section on the background of the study site (the Bayano region), which was initially written by April Lee. We both worked on editing the article. My co-author gave me permission to use the article in my thesis, to be the first co-author, and gave me the assurance that she will not use the article for her own thesis. This article was published in *The McGill Journal of Refugee and Migration Studies*.

**Positionality Statement** 

Positionality, by considering factors like individual background and worldview, can elucidates a researcher's potential biases and approaches towards their work (A. G. D. Holmes, 2020). I am a white, neurodivergent male of variable background, including Indigenous and European ancestry. I was born and spent my early childhood in Peru and then immigrated to Canada, eventually becoming a Canadian citizen. I have had access to many opportunities and advantages others have not.

I have a Bachelor of Science in Biology and a Post-Bachelor Diploma in Environment, both from McGill University. I started my PhD at McGill University in 2016. I have benefited from many resources at the university, including access to document databases and past research. Furthermore, I benefitted from working in a region, the Bayano region in Panama, in which other researchers have worked. This made the community I worked with more open to my efforts.

I generally remained, however, an outsider and actively sought to allow the community to not feel imposed on. This impacted my research methodology. For instance, in the workshop with the Maje Embera community, I would give participants a topic, which they would discuss amongst themselves and bring together a consensus answer, usually a list of points, that they wanted me to make note of. I considered that taking down notes while they spoke to be potentially too intrusive. I was cognizant that an outsider taking down what they were saying would be too imposing and could lead to self-censorship. I also felt they could have more control over the data if they decided, as a group, the key points I would take with me in my research. Had I been able to spend more time in the community, I could have used another format for gathering information. In this thesis, I also attempted to include quotes from Indigenous participants wherever possible. Beyond methodological influences, I believe one should feel compassion for all sentient beings, a view that shapes my research approach and topics.

In the end, I hope this positionality statement can offer some understanding of my background and approaches to research.

Chapter 1 Contributions to knowledge

The overarching objective in this project was the application of a Relational Values lens to the discourses and interconnections tied to the Bayano region in Panama and to the Bayano dam, explored primarily through the development of a Stakeholder Table, but also through surveys, workshops, and content analysis. These goals were attained, although some planned efforts had to be cut short, principally due to the Covid-19 pandemic. This section will discuss the many contributions to knowledge each article, along with the surrounding work, give to relevant fields of study. Notably, the articles have their own objectives but also helped lead to what is the culmination of the project, the Stakeholder Table and the "enhanced" Stakeholder Table.

The general application of Relational Values, from relationships to Frames to the Parameters of the Impact equation, is a novel way of approaching the topic and is a key contribution to future work. For instance, the use of Frames can be applied, as in this thesis, to determine when positions or views coincide or fail to coincide. The Parameters in the Impact equation are also approached from a relational perspective and elucidate how individuals with different Frames can coalesce to similar approaches to diminishing impact.

Through surveying of the Maje Embera community, their views of the changing climate, as well as the reduction in types of nonhuman animals was elucidated. This is a key contribution as Indigenous communities are not consulted enough on such issues. The results were interesting, as the survey participants saw changes in all nonhuman animal types, rather than only those they may use directly, like fish. This is a key finding, as it argues that Indigenous communities could be a good source for information on species decline. While some past research suggests many locals may be unaware that species in the area are declining (Denkinger, Quiroga, & Murillo, 2014), this research suggests that, at least for some communities, there is general awareness of decline. Scholars have discussed the use of traditional knowledge, including potentially that of Bayano communities, to supplement biodiversity information that is difficult to obtain (Hutton, Patenaude, Revéret, & Potvin, 2017). Finally, the hypothesis that the changes in climate would be seen as "unpredictable" was suggested by the results as being accurate. The workshop with the Maje Embera community was also an objective and offered a key contribution, namely bringing out what would be necessary for their community to thrive, akin to Relational Values' Good Life.

Through workshops with stakeholders, a Human-Wildlife Conflict Impact equation was developed. As discussed in the thesis, the Parameters of the Impact equation are relational in application and can bring together several mental ways of approaching a situation, or Frames. The process demonstrated the importance of the Ethics Parameter and an additional Education Parameter. Both, but particularly Ethics, are tied to a Relational Values perspective. For instance, Ethics can rely on an anthropocentric or non-anthropocentric perspective. The results for Ethics are particularly notable, as it is a more recent Parameter (see P. G. Brown & Garver, 2009) and, as such, often not included. This research thus highlights its importance and that researchers should also seek to include it. This is an important contribution for those who use the Impact equation or related efforts.

Similarly, using stakeholder workshops, terminology applicable to Human-Wildlife Conflicts which reduces the guilt placed on the wildlife, while maintaining its agency, was an objective and a clear contribution. After all, the restructuring of language, as emphasized by Relational Values literature (Simon West, Haider, Stålhammar, & Woroniecki, 2020), can be a first step towards a more humane world. While several scholars have discussed terminological changes regarding the nonhuman realm (Brevik, Adams, Dube, Barbieri, & Yahya Haage, 2020; DeMello, 2021; Dunayer, 2003; Carrie Packwood Freeman, 2010; Sinha, 2018), this thesis demonstrates first hand efforts in modifying terms by the stakeholders in the workshops. Changes such as using "sentient beings" rather than "animal" could help reconceptualize scenarios, both in explicit Human-Wildlife Conflicts and beyond. As such, these workshops offered much to the field of human-nonhuman animal relations.

Furthermore, the poll of 147 participants demonstrated that most of the participants considered themselves to have an ecocentric perspective. This is a key contribution in terms of understanding where such stakeholders, namely those involved in biology, environmentalism and sustainability, may be coming from regarding the natural world. Of course, generalizing to other stakeholders must be made with caution. After all, stakeholders involved in biology, environmentalism and sustainability may not hold similar views to other stakeholders, or the population in general. While workshop participants were chosen due to having some expertise in certain fields, individuals without such expertise may see the world quite differently.

Interestingly, in the Ecosystem Services activity, workshop participants considered services from different categories in a roughly equal manner. This is a key contribution, as it suggests that these types of stakeholders are cognizant of many kinds of services from nature. Once again, it remains to be seen whether this would apply to the population more generally.

The work on Frames is also a key contribution, with the objective being to understand the cooccurrence of Frames like Conservation and Stewardship. The results show that these Frames often do not cooccur. For instance, conservation tied to the Bayano region often does not explicitly consider the stewardship of the Indigenous communities. This is an important contribution in the area of Indigenous and "Western" interaction, particularly in understanding

when the views of the Indigenous communities match up or fail to match up with "Western" environmentalism. This argues that cooccurrence in perspectives should not be taken for granted. Actions meant to work in the environmentalist view and to be helpful to the Indigenous communities must be well thought out and it is necessary not to assume the two will coincide.

In terms of Focal species, the argument that cattle can be considered an Emblematic species for the Bayano region, due to the particular views communities have regarding them, is a general achieved objective and a clear contribution to the field. It should be helpful in other attempts to identify Focal species, by suggesting that cultural characteristics, rather than just biological and ecological ones, must also be considered. This could be true in both Indigenous and non-Indigenous communities.

The Stakeholder Table was the culmination of the other articles. It is the only comprehensive Stakeholder Table for the Bayano region, is an achieved objective, and a key contribution for those interested in the area. For one, it could be used as a key step in any impact assessment. Also, several Hidden Stakeholders were identified and synergistic sustainability projects were discussed. Furthermore, discussion in the follow-up workshops demonstrated which types of reparations were seen as preferable. For those interested in Relational Values, these results are a contribution as they show how relationships between stakeholders can be brought together under some projects. The synergistic examples in the Stakeholder Table article will also be useful for others doing similar work in which there are multiple stakeholders to consider. Another method of evaluating synergistic projects is also elaborated in the general discussion section. The method of determining Hidden Stakeholders, by applying the table to legal documents and accords, is a novel one. It is a key contribution for those who wish to find hidden and overlooked stakeholders. Finally, the "enhanced" Stakeholder Table in this thesis' General Discussion section lists a potential relationship for each stakeholder, along with a few key Relational Values that can be expressed through this. This is a clear contribution to the field of Relational Values, particularly for those who want to understand similar stakeholders in other sites or other development projects. The inclusion of relationships that would not be commonly seen as nature-inclusive is a clear contribution, as these stakeholders also play a strong role and should be considered in comprehensive analyses using a Relational Values lens. The workshops dealing with nonhuman animals were also of use in developing a Stakeholder Table that is less human-centric, by including nonhumans, such as individual nonhuman animals and ecosystems, as stakeholders. The human-centric tendency of the Good Life has been a key criticism of Relational Values (J. Piccolo et al., 2022). The Stakeholder Table in this thesis, which avoids this, is therefore a great contribution to the field of Relational Values.

## Chapter 2 General introduction and methods

## 2.1 General introduction

Whether dealing with complex development projects or day to day interactions, the valuation of the outside world is important to explore. While there is often a dichotomy of Intrinsic or Instrumental Values, Relational Values have been touted as an alternative to these perspectives (Chan et al., 2016). Instrumental Values are those where the value comes from what an object gives a subject, while Intrinsic Values are those that the object has in and of itself (Himes & Muraca, 2018). Relational Values put the focus on relationships and are defined as the "preferences, principles, and virtues associated with relationships both interpersonal and as articulated by policies and social norms" (Chan et al., 2016, p. 1462). Relational Values often discuss what is necessary for a Good Life (i.e. a thriving and meaningful one), which often include relationships with nature, with individual nonhuman animals and with other humans (Saxena, Chatti, Overstreet, & Dove, 2018). The Good Life can also incorporate relationships with social institutions and the concepts of the divine (Saxena et al., 2018). Relational Values, including place attachment, are often said to be particularly important for Indigenous groups (Lliso, Lenzi, Muraca, Chan, & Pascual, 2022). Frames, in so far as they are mental ways of seeing the world (see Oxford English Dictionary, 2022a), are tightly linked to relationships, and thus Relational Values.

While research has been done on the Panamanian Bayano dam and region, both in the past and more recently (e.g. D. Sharma, 2015; Wali, 1989b; Yahya Haage, 2019a), an explicit Relational Values framework has not been applied to this region. Dam development, such as with the Bayano dam, can have strong detrimental impacts. These can include social issues such as resettlement and low compensation, as well as effects on biodiversity and land use change

(Ledec & Quintero, 2003). Notably, the impacts of dams are often interrelated. This is the case for the Panamanian Bayano dam, completed in 1976, which led to the relocation of Indigenous and non-Indigenous communities and to severe impacts on the environment (Wali, 1989b). The detrimental issues, such as unrecognized land tenure status and biodiversity loss, remain problems even now (IACHR, 2012b; Yahya Haage, 2019a).

Considering the various actors and stakeholders in the Bayano case study, a Relational Values perspective is key, as it can include the concept of a Good Life for a stakeholder (i.e. a meaningful, virtuous life) (see Chan, Gould, & Pascual, 2018), as well as explore vital relationships with wildlife and nature. The different stakeholders in dam issues can be quite varied, and solutions to current conflicts need to consider this variability. A Stakeholder Table, in which stakeholders and their perspectives are outlined, so as to find solutions to conflict, can be a very useful tool (Vogler, Macey, & Sigouin, 2017). No comprehensive Stakeholder Table has yet been created for the Bayano region.

This thesis consists of several sections, built around a series of related articles, which use a Relational Values perspective, each with their own objectives and contributions. The overarching objective permeates each section and should be elucidated first. This overarching objective is the application of a Relational Values lens to the exploration of the discourses and interconnections present in a region, in this case the Bayano region in Panama. This chiefly includes the discourses surrounding the Bayano dam, to which groups relate in differing ways. The inclusion of the nonhuman in this exploration is also key. Each article applies a Relational Values lens directly or indirectly to the discourses in the Bayano region, with some emphasizing other components like nonhuman animals in Relational Values. However, the main way that Relational Values are used to explore Bayano is in the development of the Stakeholder Table. As such, the Stakeholder Table was built using the lens of Relational Values. Notably, while each article is an exploration on its own, they also aided in leading up to the Relational Values Bayano region Stakeholder Table.

One may ask why Relational Values could be key to a Stakeholder Table. There are several reasons, including its emphasis on relationships with the nonhuman (see Baard, 2019), as well as its use in connecting with Indigenous communities (see Sheremata, 2018). As discussed below and throughout this thesis, both themes are key, and interrelated, components of the Bayano region.

At its most pragmatic level, of course, a comprehensive Stakeholder Table is not only a way of exploring a region but can also be a key step in an impact assessment. In short, it helps to better understand the region and its circumstances. The process is also adaptable to other regions. As such, the final Stakeholder Table, which explicitly incorporates Relational Values, Human-Wildlife Conflicts, and a novel way to find and connect Hidden Stakeholders, can act as a template for Stakeholder Tables in other regions.

Some more information on Relational Values will be helpful. Relational Values are concerned with the relationships between humans and, usually, aspects of nature (Chan et al., 2018). Importantly, the relationship itself, not just the elements in the relationship, is valued (Chan et al., 2018). For instance, an individual may feel a strong sense of devotion or spiritually towards a nonhuman species, and the individual could consider the act of devotion as also meaningful. Frames, in so far as they are mental ways of seeing the world (see Oxford English Dictionary, 2022a), are tightly linked to relationships, and thus Relational Values. As the concept is used in this project, a Frame can be made up of multiple relationships. The concept of categories of Relational Values, whether the term Frame is used or not, is not new (Muradian & Pascual, 2018; Pungas, 2022; Ross, Witt, & Jones, 2018). For instance, a political Frame, say stemming from a specific religious organization, could be made up of several Relational Values, including specific relationships of care to other humans, relationships of responsibility to/from the state, and relationships of domination towards nonhuman animals (see Beisner, 2013; see Francis, 2015). This thesis will focus on specific potential Frames, such as the Frame of Conservation or the one of Stewardship. The Frames for this thesis were chosen because they are key to the Bayano region, as can be seen by past research (e.g. Horton, 2010; Wali, 1989b). Finally, this thesis considers that several Frames can come together into higher Parameters. As an example, individuals in both the left and right of the political spectrum can emphasize technology as a solution for reducing environmental impact (Empson & Rappel, 2021). In this thesis, the Parameters of the Impact equation, namely Population, Affluence, Technology, and Ethics, are explored (see P. G. Brown & Garver, 2009).

The use of these Parameters to outline a relationship with nature has been discussed by past work (P. G. Brown & Garver, 2009). However, this level of Relational Values has generally not been considered. Not only can different Frames converge on these Parameters, but the Parameters can also show relational connections. As an example of this perspective, the relationships one has for technological solutions to environmental impact (Technology Parameter), such as the technocratic view of some Objectivists (see Rand, 1988), can mediate one's approach to the Population Parameter. Similarly, the relationships with and views of wealth and capitalism (Affluence Parameter) held by some with a Socialist Frame (see Empson & Rappel, 2021), can mediate the relationships with the other Parameters, such as, once again, the Population Parameter. As Relational Values are often relationships to nonhuman animals, it is particularly important to consider a Human-Wildlife Conflict Impact equation. As an example, the adoption of a Conservation Frame, perhaps based on relationships of wonder and curiosity towards endangered species, can mediate the way one sees the trade in animal parts, which would fall under the Affluence Parameter. This view of affluence can then mediate the acceptance or relevance of the other Parameters. For instance, the importance of the Population Parameter, particularly the population size of those living near wildlife, may be downplayed. In this thesis, based on the Impact equation and the Bayano region, a Human-Wildlife Conflict version of the Impact equation is developed.

In practice, the line delineating Frames and Parameters should be seen as fluid. This is one reason this thesis is focusing on a few Parameters that can certainly bring Frames together, namely those of the Impact equation.

As mentioned above, a series of chapters (chapters 4 to 10) each use Relational Values, and the related concepts of Frames and Parameters, as a lens to explore the Bayano region in Panama, as well as to explore Human-Wildlife Conflicts (HWCs), both in Bayano and more generally. Relational Values, and the relationships involved, virtually always include nature, meaning that Human-Wildlife Conflicts (HWCs), and interactions generally, can be front and center (see Baard, 2019; see Deplazes-Zemp & Chapman, 2021; see Latombe et al., 2022; see Pimid et al., 2022). Even when ecosystem change is of interest, considering impacts on Focal species can be a useful proxy (Guerra, González, Pascual, & Dawe, 2011). Certainly, the Bayano region is connected to Human-Wildlife Conflicts, particularly as the land is encroached upon by humans (Urieta Donoso, 1994). The link between the Bayano region and Human-Wildlife Conflicts can be briefly discussed here, as Human-Wildlife Conflicts are key to this thesis. Protected areas and HWCs are often linked, particularly in terms of balancing the needs of local, often Indigenous, inhabitants and wildlife (Dowie, 2009). Although only partly in the Bayano watershed, the Guna Yala reserve, which includes the PEMASKY protected region, is a key example of this (Mulder & Coppolillo, 2005). For instance, several Indigenous scholars have discussed the increasing impact of overharvesting of plants and nonhuman animals in the region (Chapin, 1995). Relatedly, the Guna Madungandi Indigenous reserve has faced biodiversity loss (Wali, 1989b). Notably, the Guna were relocated to within this region due to their values and lifeways regarding biodiversity protection, which has become difficult to maintain due to human invaders (Wali, 1989b).

One recently emphasized example of Human-Wildlife Conflicts is overhunting when there are external social pressures. For instance, some have discussed this phenomenon, namely overharvesting, including of wildlife, due to the Covid-19 pandemic (Sen, 2021). This can be due to food insecurity, lack of income, and migration to rural areas (Sen, 2021). Another study, centered in Bangladesh, saw an increase in nonhuman animal killings since the start of the Covid-19 pandemic (Rahman, Alam, Salekin, Belal, & Rahman, 2021). Similarly, yet another study saw an increase in poaching and subsistence hunting since the start of the Covid-19 pandemic (Singh et al., 2021). For instance, more than half of those surveyed in South America agreed that subsistence hunting and illegal poaching had increased (Singh et al., 2021). It is therefore not surprising that an increase in hunting has occurred in the Bayano communities since the start of the Covid-19 pandemic (Personal communication, 2021). Relational Values and Human-Wildlife Conflicts likewise deal with nonhuman animal welfare (see Gambourg, Palmer, & Sandoe, 2012; see Lute, Navarrete, Nelson, & Gore, 2016; see Ross et al., 2018; see Woolaston, 2018), which is a concept prevalent in the history of the Bayano region. For instance, documents during the construction period of the dam discuss the market in wild nonhuman animals, which fits directly with nonhuman animal welfare (Haarington, December 07, 1974). The Noah 2 project, a key effort to rescue stranded and drowning individual nonhuman animals during the construction of the Bayano dam, is also a connection with nonhuman animal welfare (e.g. McCormick, February 24, 1976). These examples show that Human-Wildlife Conflicts, in several formats, are seen in the Bayano region. In addition, the efforts discussed in the articles that make up this thesis, including a Relational Values-based Human-Wildlife Conflict Impact equation, can be applied elsewhere and more widely. In fact, all the articles in this thesis, by helping to develop and apply a comprehensive Stakeholder Table that includes nature, are also an exploration of the Good Life for nonhumans.

A note on capitalization may be useful. "Relational Value," "Frame" and "Parameter" are capitalized to emphasize that they fall on one nested continuum. In cases of published or submitted articles, they may not be capitalized, depending on the journal guidelines or how the term is used in relation to other terms. All translations from Spanish to English were done by me.

## 2.2 Overview of articles

The articles in this thesis (Chapters 4 to 10) are organized in a systematic way. Each adds information and perspectives leading up to the development and application of a Stakeholder Table for the Bayano region and an exploration of Relational Values. Notably, by including an exploration of Relational Values, followed by the related concepts of Frames and Parameters, the types of stakeholders included are quite broad. A series of sources, from documents spanning the history of the Bayano dam to the results of workshops on Human-Wildlife Conflicts with stakeholders involved in relevant fields, are utilized. Each article in this thesis is meant to help discover new stakeholders or understand their views in a concrete way. Once the Stakeholder Table is created, it is useful to identify which are Hidden Stakeholders. As such, in a novel approach, the Stakeholder Table is applied to legal documents, such as accords, which generally discuss stakeholders. Those not mentioned in the legal documents are considered Hidden Stakeholders. These include nonhuman animals and intergenerational subcommunities. Synergistic solutions to include these stakeholders are discussed. However, even when the focus is on the Bayano region Stakeholder Table, the articles offer information that is useful for other regions, particularly when a Relational Values perspective is sought. As mentioned below, when each article is discussed, they also had their own objectives, all based on Relational Values.

The first chapter containing an article, namely chapter 4, deals with a survey of individual members of the Maje Embera Indigenous community, asking about changes in climate and changes in abundances of nonhuman animals in the region ("Determining the Views of the Panamanian Indigenous Maje Embera Drua on Environmental and Biodiversity Changes"). The key questions were what types of changes they noticed and whether they saw changes in nonhuman animals differently depending on the category of nonhuman animal. As such, determining Indigenous Focal species was one objective for that chapter. The hypothesis for the changes in climate was that they would see the changes as "unpredictable." As discussed in that thesis section, the results of this article helped identify stakeholders, while also exploring Focal species, offering a voice to an Indigenous community, and understanding how they see climate changes. This is a clear contribution to knowledge for both the region and generally, as

Indigenous communities are rarely given a chance to voice their views on changes they have noticed.

The following chapter, namely chapter 5, contains the results of a workshop with the Maje Embera community ("Informal Workshop with Members of the Maje Embera Community"). Participants were tasked with coming to a consensus on several topics, including changes in biodiversity since the construction of the Bayano dam and what they felt was necessary for their community to thrive, akin to Relational Values' Good Life. As with the surveying, this is an important contribution, as the views of the Good Life of the Maje Embera community, and Indigenous groups more generally, aid in enriching society and in helping these groups achieve their goals.

Following this chapter is one (chapter 6) containing an article that resulted from the Innovative Ideas for Environmentalism collective workshop initiative ("The Environmental Stewardship Frame, the Role of History, and the Indigenous Communities of the Bayano Region in Panama"). This paper deals with the Stewardship, Ethnicity and Historical Frames, taking an expansive temporal view. It considers when the views of the Indigenous peoples in Bayano have coincided with larger "Western" environmental views, when they have not, and when the History Frame has been used to make an argument. This paper is important as it explores when environmentalism is or isn't helpful to the Indigenous communities, a nuanced view that is often ignored in writings about the Indigenous communities and environmentalism (Rice, 2014). The use of a historical component in arguments is also an important contribution to the field of Frames. Frames, in so far as they are mental ways of approaching a topic, can be seen as an elaboration on basic relationships in a Relational Values lens. As such, this article helps explore stakeholders for the Stakeholder Table which might otherwise be missed. The subsequent chapter (chapter 7) contains an article that considers Frames during and right after the construction period of the Bayano dam (1969-1976 and 1977-1981) ("Frames, Omar Torrijos, and Media Documents during and after the Bayano Dam Construction Period"). In this thesis, Frames are seen as an elaboration on relationships. The article considers several Frames that are key to Indigenous groups. These include the Conservation Frame (discussions of conserving or protecting the environment), the Economic Frame (discussions of economic aspects), Stewardship Frame (the view that the Indigenous communities are stewards for the environment), the Ethnicity Frame (the view that the lifeways of Indigenous communities must be protected) and the Historical Frame (the use of history, including historical figures, in discussions). The article considers media documents from the specified periods of dam construction (1969-1976) and immediately afterwards, until Torrijos' death (1977-1981), noting which Frames occur and cooccur. While research on Frames has been conducted, even in the Bayano region (see Sylvester, 2015), no large scale exploration of Frames and of the cooccurrence of Frames has been done for Bayano.

The next two chapters (chapters 8 and 9) each contain an article based on 14 workshops run with individuals having academic training and/or direct experience in the fields of biology and/or environmentalism and/or sustainability. They can generally be placed as stakeholders when it comes to these topics. For instance, many advocated positions of conservation and environmental protection. In truth, the category could be called "ecology/environmentalism/sustainability," but the more inclusive "biology/environmentalism/sustainability" is preferred, as some organizations labelled themselves explicitly as dealing with "biology." The 14 workshops were inspired by the surveying and workshop with the Embera community, but with other stakeholders and academics. These 14 workshops were meant to bring in expertise on the topic that could then be applied to the documents reviewed for the Stakeholder Table and to better understand the positions of stakeholders.

The first of these two chapters deals with several activities, including one exploring terminology related to Human-Wildlife Conflicts ("Beyond Human-Wildlife Conflicts: Workshops Sought to Develop Terminology to aid in Human/Nonhuman Animal Relationships"). In essence, terminology that removes some of the guilt of the nonhuman animal in Human-Wildlife Conflicts, while maintaining some of their agency, was sought. Another activity, which was omitted from the submitted article, but is detailed in this thesis, was a brainstorming of Ecosystem Services for a hypothetical water development project (Appendix 1). Both activities helped in understanding the positions of potential Bayano region stakeholders. For instance, the terminology helped understand the Bayano Noah 2 project and thus the inclusion of nonhuman animals as stakeholders.

This is followed by the second article from the 14 workshops (chapter 9), which focusses on a greater grouping of Frames into the Parameters of the Impact equation ("Human-Wildlife Conflicts and the Environmental Impact Equation: Creating a Version through Stakeholder Workshops and Relational Thinking"). It develops an Impact equation that is focused on Human-Wildlife Conflicts. This is an important contribution, not just because it can be applied to the Bayano region, but also in the realm of Relational Values, as the Parameters can be used to connect different stakeholders, particularly the Ethics Parameter.

All these chapters culminate in the creation and analysis of a Stakeholder Table for the Bayano region in chapter 10, laying out many stakeholders, placed into meaningful categories ("Creating a Stakeholder Table, Identifying Hidden Stakeholders, Exploring Relational Interventions and Potential Reparations, for the Bayano Region of Panama"). The previous articles were used to explore the positions of stakeholders as well as develop the proper understanding to not exclude key stakeholders. As an example, the workshop on terminology led to the inclusion of several stakeholders such as species, spiritual ecosystems, and individual nonhuman animals. Using a novel method, the Stakeholder Table was applied to a set of legal documents, spanning decades of Panamanian history, starting at the construction of the Bayano dam. This method, based on the relationships between stakeholders and the legal system, was done in order to find Hidden Stakeholders. Following this, synergistic methods to beneficially target as many Hidden Stakeholders as possible was undertaken. Finally, follow-up workshops were conducted on potential reparations from some Bayano dam funders, which were, interestingly, Hidden Stakeholders. This contributes much to the field, not only as it is the most comprehensive Stakeholder Table for the Bayano region, but because it uses a novel way to find Hidden Stakeholders, and it explores what reparations may be most palatable for people to accept. The reparation options were based on the workshop with the Maje Embera, but are applicable to many regions of the world. It is also a key contribution to the Relational Values field as each stakeholder is linked to their positions on the Bayano region, similar in concept to, at least partly, their Good Life. The positions go beyond the general nature-inclusive versions of the Good Life, towards a more expansive understanding of the field. This inclusion of other Relational Values is a needed contribution to the field, if only to not miss Hidden Stakeholders in Relational Values studies and research. The General Discussion section of this thesis contains the "enhanced" Stakeholder Table, which adds Relational Values to each stakeholder, which is of benefit to anyone interested in understanding stakeholders.
In sum, by using a Relational Values lens, and an associated Frames perspective, several new avenues are explored. Each chapter and the articles within target specific objectives, offer new contributions to knowledge while also leading to a better understanding of stakeholders and their relationships to the Bayano region. All these chapters culminate in the article on a Bayano region Stakeholder Table, which uses novel methods to find Hidden Stakeholders and adds to the area of reparations, particularly from development project funders.

Two key goals of this thesis are therefore to use Relational Values, and the related concepts of Frames and Parameters, to better understand the Bayano region, as well as to use the Bayano region as a case study to explore how similar methods can be used in other regions. For instance, for the latter, the novel method to find Hidden Stakeholders, based on relationships of stakeholders to the legal system, can be applied more widely. Similarly, the Human-Wildlife Conflict Impact equation activity could be applied to the Bayano region, particularly the discussions of stakeholders, but the method can also be used for other regions.

2.3 Overview of methods (for chapters 4 to 10)

2.3.1 General methods for chapter 4 (Survey with an Embera community)

# Article title: "Determining the Views of the Panamanian Indigenous Maje Embera Drua on Environmental and Biodiversity Changes"

This published article uses results from a survey questionnaire filled in by 21 members of the Maje Embera Indigenous community, in the Bayano region. Surveying was done by Gabriel Yahya Haage, who worked with Felipe Pérez-Jvostov to develop the survey questions. The questionnaire had both structured and semi-structured questions, although the ones used for the article were structured questions. The article makes use of the questions regarding changes community members have noticed in the past 10 to 15 years. These include changes in the length and timing of the dry and wet seasons. Each question offered three options, including that the changes are "unpredictable." They were also asked to identify whether they have noticed changes in abundances of different categories of nonhuman animals (fishes, mammals, birds, and reptiles), and whether these were increases or decreases. For the data analysis, Pearson's Chi-square goodness of fit test (J. H. McDonald, 2014) was used to see which category was most common in climate-related questions. Pearson's Chi-Square goodness of fit, along with the Cochran's Q statistical test (NCSS, 2014; West et al., 2010), were used to determine whether respondents saw changes in abundance evenly for all categories of nonhuman animals or if certain categories, such as "fish," received more notice in terms of changes in abundance.

2.3.2 General methods for chapter 5 (Workshop with an Embera community)

## Article title: "Informal Workshop with Members of the Maje Embera Community"

A workshop with the Maje Embera community was also done and was first published in the report "Developing a Child-Centered Water Poverty Index: General Guidelines and the Case Study of the Bayano Region, Panama (Version 1.0)".

The workshop/focus group with 10 members of the Maje Embera Indigenous community allowed me to get a community-level view, in comparison to the sampling of individuals. Such workshop/focus group events can be defined as a "research technique that collects data through group interaction on a topic determined by the researcher" (D. L. Morgan, 1996, p. 130). The topic was developed by me, based partly on the individual survey questions and with input from a Maje Embera community member who was my intermediary in the surveying. However, the method that was used for the Maje Embera community workshop was an attempt to reduce my impact as the facilitator running the event. As such, the group was given a question, which they would discuss amongst themselves and come to a consensus answer that they would bring to me,

as facilitator. Taking notes during the discussion was considered too intrusive for this community, which can be wary of outsiders.

The literature has discussed several advantages of running workshops or focus groups, which are relevant here. An advantage of running a focus group is that it can "generate interchange and debate between respondents" (Secor, 2010, p. 199). As such, the results can be different from individual sampling. Furthermore, a difference is that the interaction between participants can "[highlight] their view of the world, the language they use about an issue and their values and beliefs about a situation" (Gibbs, 1997, p. 3). This is of particular importance with Indigenous groups, which can use language and views that differ from "Western" views (see Clinker, 2021; see Nash, 1989). This is also key when a Relational Values perspective is taken, as one wants to allow participants to explore their relationships to nature, rather than imposing one's own. Workshops and focus groups are also key to make participants feel part of the "decision making processes" as well as "to be valued as experts" (Gibbs, 1997, p. 3). For the Maje Embera workshop, some community elders, who did not feel comfortable in individual sampling, including due to language issues, could now act as experts for this event. Relatedly, taking part in workshops or focus groups can help participants feel they are part of the research efforts, which can be empowering (Gibbs, 1997).

2.3.3 General methods for chapter 6 (Relational Values, Frames, the Bayano region, and history) Article title: "The Environmental Stewardship Frame, the Role of History, and the Indigenous Communities of the Bayano Region in Panama"

The third article was the result of the Innovative Ideas for Environmentalism initiative (2019) which I headed and facilitated. The initiative was open to both undergraduates and graduate students interested in exploring environmentalism. The initiative took place as a series

of group meetings in Montreal and was methodologically based on the "collective writing" movement. Specifically, it based itself on the work of C. A. Taylor (2014) who ran a collective writing series of workshops. As with their work, a "collaborative, participatory methodology" was encouraged (C. A. Taylor, 2014, p. 398). Relatedly, I attempted, by giving voice and decision-making power to the participants, to create group meetings which "contest instrumentalist, hierarchical, student-as-consumer models of higher education" (C. A. Taylor, 2014, p. 398). Susinos-Rada, Ceballos-Lopez, and Saiz-Linares (2017) describe a similar tact towards more academic writing, although a key difference is that for the papers in the Innovative Ideas for Environmentalism initiative, there was a single author for each paper. The collaborative component fell to aspects like encouragement and aid in finding sources.

As the name suggests, the Innovative Ideas for Environmentalism initiative sought to develop and explore ideas in environmentalism. However, what would be explored was allowed to come organically from the group, through discussion and consensus. From a Relational Values perspective, the relationship between participants, and that between participants and their chosen topic was emphasizing, such as suggesting topics that the participants had an emotional link to, including curiosity. This was meant to go beyond the structured and instrumental process of choosing a topic for a course paper or academic publisher.

In the first workshop, I, as facilitator, gave a presentation on the fertile ground that transdisciplinary thinking can lead to. The concept of Orphan Disciplines (see P. Brown & Erickson, 2014) were given as examples of the necessity of thinking beyond the norm. Three, self-selected, students participated until the end of the semester-long series of biweekly group meetings. They early on decided on a topic to explore, namely the Bayano region of Panama. Each individual, including me, picked an aspect that was of particular interest about the topic and developed a work based on it. While each individual wrote their own paper, the group sessions were used to find interesting sources and to act as a wellspring of positive encouragement as they worked through their topic.

The group organized a symposium, open to the public, at which each paper, along with some others, were presented. The papers were then compiled into a conference proceedings document, released by the initiative.

2.3.4 General methods for chapter 7 (Relational Values, Frames, the Bayano region, and media) Article title: "Frames, Omar Torrijos, and Media Documents during and after the Bayano Dam Construction Period"

In this article, the Relational Values perspective is considered in terms of Frames or mental ways of approaching scenarios and events. This article is tied to the paper "The Environmental Stewardship Frame, the Role of History, and the Indigenous Communities of the Bayano Region in Panama," detailed above.

This article considers media documents which discuss the Bayano dam in the construction period (1969-1976) as well as the subsequent post-construction period until Omar Torrijos' death (1977-1981). The documents were obtained by searching databases for the terms "Bayano AND dam," "Bayano AND presa" and "Bayano AND represa." The databases searched were PubMed, Ebesco Host, Factiva, Web of Science, ProQuest, ECOLEX, FAOLEX, Gale Newsvault, Google Newspaper, the Hispanic American Periodicals Index (HAPI), JSTOR, Redalyc, Scopus, Wiley Online Library, LexisNexis, and the World Bank document database. In cases where the databases only give recent results, they were used to try and track down mentioned media documents.

Using key Relational Values Frames (Stewardship, Ethnicity, History, Economics, and Conservation) as codes, a content analysis was performed on the media documents. There was also flexibility so as to allow new themes to arise from the documents, as suggested in the literature (see Gale, Heath, Cameron, Rashid, & Redwood, 2013). Furthermore, since more than one Frame can occur in a document, a standard Jaccard index (Addinsoft, 2020; Pielou, 1984), conducted through R studios, was performed, with a similarity of 0.2 (20%) set as a threshold of interest. The level of cooccurrence of Frames could thus be calculated. Furthermore, for Economics and Conservation, the two most common Frames, Fisher's exact test of independence analyses (J. H. McDonald, 2014) were done to determine whether there were, proportionally, significantly more documents with these Frames during the construction or post-construction period.

2.3.5 General methods for chapter 8 (Relational Values, Human-Wildlife Conflict and terminology)

# Article title: "Beyond Human-Wildlife Conflicts: Workshops Sought to Develop Terminology to aid in Human/Nonhuman Animal Relationships"

This article, accepted in the journal *Relations. Beyond Anthropocentrism*, is based on workshops run in the years 2020 and 2021, which were meant to bring out topics and ideas to help in exploring the documents in the Bayano region, particularly when it came to relationships between humans and nonhumans, including in Human-Wildlife Conflicts. Such workshops were seen as important as several stakeholders can have different Relational Values towards the nonhuman. While somewhat different in content, these workshops connect thematically with the workshop and surveying done with the Maje Embera community. In fact, that workshop was the inspiration for holding these workshops. An activity that was not included in the article but is

also key, was a discussion of Ecosystem Services in a hypothetical hydrology-based scenario. That section can be found in the appendix (Appendix 1) and is more fully discussed in the general discussion section of the thesis.

Fourteen workshops were run, with a total of 147 participants. Participants received 50 Canadian dollars per workshop, with notetakers receiving an additional 50 Canadian dollars. Participants were considered to have expertise or to be strongly involved in biology and/or environmentalism and/or sustainability. Participants were recruited through listservs, including academic and discipline-based listservs. Snowball sampling (Bahr, 2015) was also used, in which potential participants suggested other individuals or organizations to consider. The workshops were done virtually and all participants were adults.

It is useful to note in this section that, before being split into their subgroups, participants were polled as to whether they see themselves as anthropocentrists, biocentrists or ecocentrists. Results were (out of 147): 94 chose ecocentrism, 38 chose biocentrism, and 15 choose anthropocentrism.

In terms of methodology for the nonhuman terminology component, the topics of Human-Wildlife Conflicts and Human-Human Social Conflicts were introduced and participants were divided into subgroups (40 in total) of at least three members. They were tasked with developing terminology which would help diminish the "guilt" which might be placed on wildlife in Human-Wildlife Conflicts, while trying to maintain the agency of the wildlife. I offered some examples to get the conversation started, such as using "damage," instead of "conflict" or the notion that a species could be made into an "icon" for a region, namely acting as an Emblematic species. Importantly, I used the term "animal" rather than "nonhuman animal" during the workshops, to avoid bias. The notetakers would track the discussion and views of the participants. A thematic analysis (Gale et al., 2013) was then performed by me on the notes that were taken. As the groups generally reached a consensus on a set of terms, and the examples I gave could act as a codebook, the thematic analysis was straightforward. The terms were noted and placed into meaningful categories, such as positive/negative views on Emblematic species, and terms/discussions seeking to reduce the human/nonhuman divide.

For the Ecosystem Services activity, which did not make it into the article proper, the methodology was similar. A case study, based on McCauley (2006), was presented to participants in ten of the 14 workshops (101 participants). In this case study, a watershed is maintained because it can act as a water filtration system which is much cheaper than building a filtration plant. The participants were then given the scenario that the filtration plant would be much cheaper than maintaining the watershed and were tasked with arguing, from an anthropocentric perspective, for maintaining the watershed anyways. The answers, taken down by the notetakers, were considered from a manifest content analysis method (Vaismoradi, Turunen, & Bondas, 2013), with the categories of Ecosystem Services as the codes. Fisher's exact goodness of fit was used to see if a category was chosen more often than expected by chance.

2.3.6 General methods for chapter 9 (Relational Values, Human-Wildlife Conflict and the Impact equation)

# Article title: "Human-Wildlife Conflicts and the Environmental Impact Equation: Creating a Version through Stakeholder Workshops and Relational Thinking"

For this article, the same fourteen workshops as in the previous article were used, here considering higher groupings of Relational Value Frames, namely the Parameters of the Impact equation (Population, Affluence, Technology, and Ethics). The link between these Parameters

and relationships has been considered in the literature (see P. G. Brown & Garver, 2009). As with the other article arising from these workshops, the purpose was to better understand the documents and viewpoints linked to the Bayano region. For instance, the pressure of population growth can be an issue for communities in the region, as can affluence, both locally and distally (see Distefano, 2005; see Torres & Nunez, 1995). Furthermore, the question of which stakeholders have the most influence is key to this article, which was helpful for developing the Bayano region Stakeholder Table. Finally, when one considers the key criticism that the Good Life in Relational Values is often human-centric (J. Piccolo et al., 2022), finding stakeholders, such as within the nonhuman, becomes a key aspect of a complete Relational Values Stakeholder Table.

For these activities, a Human-Wildlife Conflict (HWC) Impact equation was developed. Considering that conflicts between wildlife and humans, as demonstrated by the surveying and workshop in the Maje Embera community, is a key issue, these activities can broaden the discussion by bringing in the useful Parameters of the Impact equation.

After an introduction to Human-Wildlife Conflicts, the Impact equation, and what an HWC Impact equation might be like, participants were placed in their subgroups. They were tasked with identifying a Parameter which could act as a leverage point to achieve the most change in terms of HWC impact. Alternatively, they could chart a path to reducing the most impact, including a sequence of Parameters. For instance, a subgroup could argue that the easiest Parameter to change is Ethics, which would make it easier to change Population, which would lead to the greatest reduction in impact. Simple manifest content analysis (Vaismoradi et al., 2013) was used to determine the most common single Parameter or most common first step in a sequence of parameters. A Fisher's exact goodness of fit helped determine whether a Parameter appeared significantly more than the others. Participants were also tasked with coming up with a new Parameter or a new subcomponent for a Parameter. Once again, as they had a clear task with a clear result, simple thematic analysis could be performed to find new inclusions (see Gale et al., 2013).

Finally, participants were asked to determine which stakeholders could have a strong influence in terms of reducing HWC impact. Using manifest content analysis, stakeholders were divided into "international," "national," "local," and "other." As mentioned, this was particularly helpful for the Bayano region Stakeholder Table.

2.3.7 General methods for chapter 10 (Bayano Stakeholder Table)

# Article title: "Creating a Stakeholder Table, Identifying Hidden Stakeholders, Exploring Relational Interventions and Potential Reparations, for the Bayano Region of Panama"

This article is the culmination of the other articles, which helped understand and frame the various stakeholders involved. The article followed a set of iterative steps.

A Stakeholder Table for the Bayano region in Panama was first developed. The sources, included the surveying, the 14 workshops with participants involved in biology and/or environmentalism and/or sustainability, and a review of scholarly and non-scholarly documents spanning from the construction period of the Bayano dam to the present (2019), were used.

These latter sources were the most extensive and documents were obtained by searching for "Bayano AND dam," "Bayano AND represa" and "Bayano AND presa." The databases searched were PubMed, Ebesco Host, Factiva, Web of Science, ProQuest, ECOLEX, FAOLEX, Gale Newsvault, Google Newspaper, the Hispanic American Periodicals Index (HAPI), JSTOR, Redalyc, Scopus, Wiley Online Library, and the World Bank document database. In total, 302 documents of interest (spanning 1969-2019) were collected. The procedure for identifying stakeholders was simple. First, a sample of 50 documents was taken from the 302 Bayano-related documents collected from the databases, a common process in thematic analysis (see Gale et al., 2013; see Pickering & Byrne, 2014). This was done to get an initial understanding of the stakeholders involved. This then helped guide the search for stakeholders when reading through all the sources of information, including the workshop results and fieldnotes from past researchers.

Once developed, the Stakeholder Table was reviewed by an individual familiar with documents pertaining to the Bayano dam from its construction onwards. The table was then applied to relevant legal documents linked to the region, to find Hidden Stakeholders. Hidden Stakeholders are those not discussed in the legal documents.

Three follow-up workshops were conducted to find appropriate ways to include some key, but ignored, stakeholders. To create a leverage point for the inclusion of stakeholders, a Hidden Stakeholder with a potentially strong influence was determined based on the sources. Potential interventions of this prominent, yet hidden, stakeholder were explored. These potential interventions also sought to have a strong decolonization component, particularly when discussing hidden Indigenous stakeholders.

The workshop participants in these three follow-up workshops (44 participants) were selected from the pool of 147 from the initial workshops, based on their availability and interest. Participants received 50 Canadian dollars, with notetakers receiving an additional 50 Canadian dollars. The potential inclusion of these Hidden Stakeholders was discussed. This included a discussion of potential reparations from a hidden, yet important, Bayano dam funding source, with reparations defined as the "action of making amends for a wrong or harm done by providing payment or other assistance to the wronged party" (Oxford English Dictionary, 2009, 3a). The

potential reparation choices were partly based on the workshop conducted with the Maje Embera Indigenous community.

By taking a Relational Values perspective, in which the relationships between stakeholder groups are front and center, sustainable methods that target multiple Hidden Stakeholders with a single action or project, are explored in this article. As such, the Hidden Stakeholders discovered in a previous step were considered here. A similar process was previously performed in regards to water poverty, Children's Rights, and the Bayano region (Yahya Haage, 2019a).

In summary, several different, yet related, methods were used for the articles and papers in this thesis. These include workshops, content analysis, and surveying. In the end, the works culminate in the article on the Stakeholder Table, in which novel methodologies are also used to identify Hidden Stakeholders. Relational sustainability projects, which simultaneously target multiple Hidden Stakeholders, are then put forth.

#### Chapter 3 Literature review

#### 3.1 Relational Values

#### 3.1.1 Introduction to Instrumental Values and Intrinsic Values

The Relational Values (RV) perspective is largely a response to the Intrinsic/Instrumental Value dichotomy. An understanding of these two perspectives is therefore key to understanding Relational Values. This first section will discuss Instrumental Values. The subsequent section will discuss criticisms of Instrumental Values and the use of Intrinsic Values. Both look at the characteristics of an organism and determine the qualities that would give them moral consideration (Deplazes-Zemp & Chapman, 2021). This includes contemporary people, future people, nonhuman animals, and other nonhumans.

Both Intrinsic and Instrumental Values can be seen as directional between the subject and the object. For Intrinsic Values, the direction goes from the subject (the human) to the object (natural attribute), as the subject recognizes something of value in the object (Deplazes-Zemp & Chapman, 2021). For an Instrumental Value, the direction goes from the object to the subject, as the subject cares about what the object can offer them (Deplazes-Zemp & Chapman, 2021). As such, the direction shows in "which element the respective valuing relation is oriented" (Deplazes-Zemp & Chapman, 2021, p. 6).

### 3.1.2 Instrumental Values

In Instrumental Values, a distinction is usually made between humans and the nonhuman. This is based on characteristics that are found in humans but not nonhumans. As has been discussed elsewhere, these distinctions have a long history (Kuper, 2015). Human rationality is a key difference which has been used to justify the utilization of the environment by humanity (Kuper, 2015). As an example, Kant had rational thought as the key reason for a form of anthropocentrism (Robinson, 2014), although Kantian arguments against anthropocentrism have also been put forth (Dussault, 2013). Others have argued that humans, as truly conscious beings, are the only ones who can demand and create the components necessary for their survival, like adequate shelter (Peikoff, 1993). As such, they are the only ones whose position is necessary to consider. This can extend across the political spectrum, from Adam Smith's capitalism to Marxist writings (Kuper, 2015).

Modern perspectives have also argued for the primacy of humans and the Instrumental Value of the nonhuman world (see Boyd, 2017). For instance, in terms of vital characteristics, it is possible to give moral standing to only human beings based on other attributes. As discussed elsewhere, this can go beyond the religious belief in the importance of humans, although this can be part of the argument (see Carrie Packwood Freeman, 2010). The characteristics of sentience, consciousness, and communication are used to argue that the separation of humans from the nonhuman animal is unavoidable (see Boyd, 2017; see Heikkila, 2018).

Different typologies of Instrumental Values have been developed. For instance, in Hay's typology of anthropocentric instrumental categories, they discuss "Unrestrained Exploitation and Expansionism," "Resource Conservation and Development", and "Resource Preservation" (Hay, 2002, pp. 32-33). The first refers to what "Western" society has done for most of history, using

resources with impunity, regardless of actual resource availability (Hay, 2002). The second also uses resources for mankind, but understands that resources are limited and must be kept, in part, for future generations (Hay, 2002). The final category understands that maintaining ecosystems and natural structures is necessary for human survival (Hay, 2002). These can be seen as precursors to the Ecosystem Services perspective.

### 3.1.2.1 Ecosystem Services

If one continues with the idea that only those who are human deserve true moral consideration, one is squarely in anthropocentrism. The notion of Ecosystem Services (ES) falls into this area (McCauley, 2006). Ecosystem Services are "the benefits people obtain from ecosystems" (Millennium Ecosystem Assessment Board, 2005, p. 40). Ecosystem Services include "Provisioning Services" like food and lumber, "Regulating Services" such as climate and water quality, "Cultural Services" such as beauty and spirituality, and "Supporting Services" like nutrient cycling (Millennium Ecosystem Assessment Board, 2005, p. 40). Supporting Services, which can include soil formation and photosynthesis, are particularly relevant as they help support processes that can lead to other Ecosystem Services (Millennium Ecosystem Assessment Board, 2005). Such services are not "final" services and so are more difficult to interact with (Fox, 2021, p. 30).

Quantification is common in Ecosystem Services, including both monetary and nonmonetary quantifications (Healy & Secchi, 2016). A criticism of Ecosystem Services is that it can give a monetary value to natural systems (McCauley, 2006). In fact, early work gave a steep price tag for nature, although this was probably meant to be hyperbolic rather than literal (see Costanza et al., 1997). Regardless, Ecosystem Services methodology has been used to place values, including monetary value, on services. These can include Willingness-to-Pay, Travel Cost, and Hedonic Pricing (Liekens et al., 2013; Pascual et al., 2010; Value of Nature to Canadians Study Taskforce, 2017). This component of Ecosystem Services has been criticized as potentially "Selling out on Nature" (McCauley, 2006, p. 27).

As mentioned, since Supporting Services are not final services they are difficult to contend with (Wood, 2017). Some discuss that the same service can be intermediate for one stakeholder and final to another, complicating matters (Wood, 2017). Similarly, the concept of Ecosystem Disservices is still nebulous, and terms are debated, which make them particularly difficult to place in a market system (Kadykalo et al., 2019; McCauley, 2006).

The Ecosystem Services perspective tries to include as many relevant stakeholders as possible, even while remaining instrumental in focus. For instance, Cultural Ecosystem Services are suggested to be similar to valuing others beyond the use to humans (Unks, Goldman, Mialhe, & Roque de Pinho, 2021). In fact, some authors have placed Cultural Values as non-instrumental (Unks et al., 2021). Bequest Values also give value to future generations, whether through Weak or Strong Sustainability (Häyhä & Franzese, 2014).

Other Ecosystem Services also bridge the passage between Instrumental and Intrinsic Values. Consider Evosystem Services, which, by looking at the advantages of biodiversity to encourage beneficial evolution to take place, certainly consider a long view and incorporate many organisms (Faith et al., 2010). Of note when discussing Ecosystem Services are Existence and Warn Glow Ecosystem Services (Davidson, 2013). Existence Services refer to the feelings a human gets knowing a habitat or species exists, even if they don't interact with it directly (Davidson, 2013). Warm Glow Ecosystem Services include the positive emotions one feels by considering that an aspect of nature is important to another, even if they do not benefit humans directly (Davidson, 2013). Even in such cases, however, the feelings are filtered through humanity (Davidson, 2013). Other instrumental perspectives try to bridge the gap between Instrumental and Intrinsic Values. For instance, some have discussed the view that certain animals are already in pseudo-contracts with humans, as is perhaps the case for domesticated animals (see Matevia, 2016).

A common argument in instrumental discourse is the Convergence Hypothesis, which argues that the result, in terms of environmental protection, is the same whether an Instrumental or Intrinsic Value is taken up (see McShane, 2009). This can be expanded to offer tacit protection to the nonhuman. For instance, some Compassionate Conservationists argue that seeking the welfare of the individual organism, which Ecosystem Services could definitely agree with, if only as it pertains to human benefits, means taking care of the whole of nature (see Branco, Soriano, Schnaider, & Molento, 2017). In other words, nature suffers more from our interference than without it and helping one or two animals affected by humanity's incursions in nature helps the whole ecosystem (Branco et al., 2017). This is reminiscent of the Strong versus Weak versions of sustainability discussed in Ecosystem Services literature (Häyhä & Franzese, 2014). It also harkens back to the pronouncement of E. O. Wilson (2014), who stated that we should tread lightly on this world, as it is the world we have evolved to be in and our efforts to replicate it have been extremely flawed. These are all methods based on only humans having moral value, but which result in aiding the nonhuman world.

Scholars have criticized Ecosystem Services, including due to the argument that nonmaterial benefits are not emphasized enough, despite the category of Cultural Ecosystem Services, in which many would fall (Ishihara, 2018). A modification of Ecosystem Services has been developed, namely the Nature's Contributions to People or NCP framework (Ishihara, 2018). In this NCP perspective, "culture permeates" across the regulating, material and nonmaterial aspects of this concept (Kadykalo et al., 2019, p. 270). This is in contrast to the earlier Ecosystem Services system, for which Cultural Ecosystem Services was its own category and often critiqued for its difficulty to measure (Kadykalo et al., 2019). NCPs can include both positive and negative contributions (Kadykalo et al., 2019). As one author discusses, the Nature's Contributions to People perspective can be very fruitful, and can included many "nonmaterial, non-consumptive and intangible" benefits of environmental components (McElwee, 2021, p. 1). As such, this may be a good bridge to another attempt to connect with the outside world, namely, Relational Values.

# 3.1.3 Intrinsic Values

As one moves from Instrumental to Intrinsic Value, it must first be noted that the attributes that separate humans from nonhumans, and thus give moral consideration to humans, are not that clear-cut. Some point to reason or consciousness as being the undeniable separation between humans and nonhumans (see Boyd, 2017; see Heikkila, 2018; see Lawrence, 1995). Language is also a classically claimed difference (see Boyd, 2017; see Heikkila, 2018; see Lawrence, 1995). In reality, there is ample evidence that other nonhuman animals can reason, as well as communicate and have consciousness (see Boyd, 2017; see Heikkila, 2018). Friendship and culture have also been argued as the distinction, both of which have now been seen in nonhuman animals (Linzey, 2013). In general, the divisions are probably ones of degree, not kind (see Boyd, 2017; see Heikkila, 2018). These recognized attributes have been used to argue for Intrinsic Value for some nonhuman animals (Boyd, 2017). These ideas, often arguing for differences in spectrum but not in kind, are not new. For instance, scholars have pointed out that both Darwin and Hume have been used for such arguments (Hay, 2002; Regan & Singer, 1989).

Heikkila (2018) also discusses the potential circular reasoning in arguments that humans are greatly distinct from nonhuman animals. For instance, in terms of sentience, arguing that nonhuman animals are seen as separate because they don't have "human" sentience (chosen by fiat) is misleading as they, not being humans, almost certainly would not have it (Heikkila, 2018). Relatedly, Linzey (2013, p. 311) argues against choosing a characteristic for the human/nonhuman animal divide, as "all moral categories and distinctions are themselves liable to change as our own moral sensibilities develop and our scientific understanding increases."

Generally, there are several reasons an object may be considered intrinsically valuable. The first is to assert that it is valued for its own sake, which is sometimes called its "final value" (Deplazes-Zemp & Chapman, 2021, p. 7). A related position is that something is intrinsically valuable due to some characteristic of the object, such as sentience or its possession of interests (Deplazes-Zemp & Chapman, 2021). The characteristic it possesses which can give it value may also be somewhat abstract, such as "rarity" (Deplazes-Zemp & Chapman, 2021, p. 7). Another example of an abstract and difficult to define characteristic that can give Intrinsic Value to a species or ecosystem is the concept of "wildness" (N. J. Beausoleil, Appleby, Weary, & Sandøe, 2014, p. 131). Intrinsic Value can also be given to processes, such as evolution, and evolutionary history, as well as genes (J. J. Piccolo, 2017). The latter can be seen as "value-laden, and [having] evolved to promote the good of the organism" (see Thomas, 2020, p. 10).

The inclusion of nonhumans has also been argued as necessary in creating a just society. For instance, the Veil of Ignorance, a thought experiment in which a human forgets their attributes, like wealth, and must come up with a just world, can be extended to species (see Matevia, 2016; see Narveson, 2017). One could forget what species one is and thus create a just society for all animals (see Narveson, 2017). However, it has been argued that some nonhuman animals simply cannot be included, like predators (Barilan, 2004). In contrast, Ariansen (1998, p. 156), who was writing on a similar topic, suggested that just because someone can innately not play by the "rules" of an ethical "game" does not mean they are out of consideration or that others do not owe them due consideration.

Some have also discussed, in critiquing the Animal Rights movement, that one could argue that considering characteristics "related" to humans, such as consciousness, is itself a form of discrimination against plants and even natural features (see Li, 1996, p. 259). Some have discussed that certain aspects, such as consciousness, may lead to unfortunate actions, such as valuing some nonhuman animals over others (see Curran, 2005). In fact, as discussed by scholars, it could conceivably mean getting rid of local biodiversity in efforts to protect nonnative species (see Curran, 2005).

A common focus, in terms of nonhuman characteristics, is the question of suffering. It is argued that, if a nonhuman can suffer, it has an interest in not suffering (Singer, 1989). From such a sentientist or pathocentric perspective, all beings who experience suffering have interests in not suffering (Singer, 1989). As such, their interests in not suffering exist even if they are of no instrumental value to humans (Singer, 1989).

However, the basic framework of pathocentrism can be further expanded to be more inclusive. For instance, it can be expanded to include nonhumans that do not suffer, but can have interests without even being aware of it, such as plants (Varner, 1990). As an analogy, one can consider an ancient sailor who has an interest in consuming vitamin C, to avoid illness, but is not consciously aware of this interest (Varner, 1990). Similarly, a plant would have an interest in sunlight, even if they are unaware of it (Varner, 1990). Another way of seeing this is that "death" is an undeniable harm. As such, avoiding that harm should be a goal, whenever possible,

meaning all living things deserve some of our moral consideration, even without any other characteristics (Hourdequin, 2018).

Even in a utilitarian perspective, the maximization could be considered to be maximizing an organism's flourishing, rather than the more common maximization of happiness or a lack of suffering (see Davidson, 2013). Of course, there is no necessity to remain in the language of an organism's interests, as the concept of rights is just as open to expansion (Dussault, 2013). As discussed by Thomas (2020, p. 8), the nonhuman can also be given Intrinsic Value based on a "quasi-Aristotelian" view of flourishing. All aspects that can be said to flourish, from humans to weeds, can be said to have Intrinsic Value (O'Neill, Holland, & Light, 2008). In Hay's typology of eco-philosophies, this fits with the "cell life" perspective, where nonhuman living things have interests and therefore have Intrinsic Value (Hay, 2002, p. 33). This can be further expanded to include all nonhumans, living or not living, that have a telos (see Hay, 2002). This is what is sometimes discussed as "autopoiesis" Intrinsic Value (see Hay, 2002, p. 33).

Intrinsic Values can be seen as a way of caring for the nonhuman world. While generally not discussed, some have argued that Intrinsic "Disvalues" from nature are also important to consider (Lliso, Lenzi, et al., 2022, p. 2). An Intrinsic Disvalue is an aspect of nature "perceived to be bad in itself, regardless of its impact, consequences on, or reference to people" (Lliso, Lenzi, et al., 2022, p. 2). These can be processes or aspects that are "perceived [...] to be 'unnatural'," and therefore intrinsically bad (Lliso, Lenzi, et al., 2022, p. 3). Examples can include the disvalue of blood sports like bullfighting or even predators in general (Lliso, Lenzi, et al., 2022).

Certainly, Intrinsic Value is not simply a theoretical position. The fact that many humans, at least subjectively, give Intrinsic Value to the nonhuman world is difficult to deny. Several

thought experiments seem to demonstrate this. For instance, Routley (1973) offers the Last Man and the Last People example. In the former, the last man in existence chooses, before dying, to destroy all the living beings and ecosystems on earth. This can be expanded to the Last People thought experiment, in which the last generation in existence chooses to destroy all environments and ecosystems. In both cases, many people would see this as the wrong thing to do, suggesting the value of nature is prominent in the "environmental ethic," which is contrary to "chauvinism" and argues that certain behavior is "morally impermissible" (Routley, 1973, p. 208). As argued elsewhere, this fits well with the fact that humans offer Intrinsic Value to the nonhuman (Thomas, 2020). Another thought experiment with a similar argument considers a human who can destroy a planet of their choosing. They are more likely to destroy a lifeless planet, than one with life, even if that life is nonhuman (Thomas, 2020).

Other fields have also explored subjective or experiential views that reduce the difference between the human and nonhuman. In terms of multispecies ethnography, Fijn and Kavesh (2021) discuss several cases in which the human and nonhuman separation is contested, including in the crocodile attack of a scholar, who, in that moment, found anthropocentrism disappearing, as they became simply a potential meal for the crocodile. They went from the top of the food chain to simply a potential snack. This is, of course, more metaphorical, but it does show that the mind is capable of seeing beyond a basic anthropocentrism.

### 3.1.4 Is the Instrumental/Intrinsic Value a true or useful dichotomy?

It should be noted that some reject the Intrinsic/Instrumental dichotomy, arguing that, while both types of values exist, they should not be of equivalent status (J. J. Piccolo, 2017). According to this perspective, Intrinsic Value should be the basis of conservation and environmental science, with Instrumental Values being useful in certain circumstances (J. J. Piccolo, 2017). For instance, one could look at the analogy of a war, where the "difficult decision for a nation to go to war [...] does not mean we diminish the moral value of human life" (J. J. Piccolo, 2017, pp. 10-11).

As discussed by certain scholars, Intrinsic Values are sometimes said to not function as a strong motivation to work towards conservation (see Batavia & Nelson, 2017). As Batavia and Nelson (2017, p. 373) argue, however, intrinsic valuation is not only foundational, but it "motivates conservationists." Another potential overlap is in the concept of cost/benefit analysis. While often considered a method in instrumental valuation, some have made the case that intrinsically valued objects can also fall under this rubric (Schmidtz, 2001). For instance, one may intrinsically value a work of art but be willing to sell it for the right monetary compensation (Schmidtz, 2001). As another example, if two intrinsically valued species are threatened and there are limited monetary funds, a decision, based on cost/benefit analysis, may be necessary to decide which to save (Schmidtz, 2001).

### 3.1.5 Other notable approaches to Instrumental and Intrinsic Values

There are other notable positions on Intrinsic and Instrumental Values. The "pure approach" to Intrinsic Value is one that requires a "leap of faith" and "subjective" acceptance of the value of nature (Curran, 2005, p. 62). It is not something that can be achieved rationally (Curran, 2005). Deep Ecology has been placed in this category by some scholars (Hay, 2002). Deep Ecology is a perspective that does not base itself principally on objective arguments, but seeks a total reformulation of humanity's thinking that includes a subjective evolution of thought (Hay, 2002). As Hay (2002, p. 41) discusses, it is a broad term, which can range from "interrogating one's assumptions concerning ecological relationships in ever 'deeper' sequence until the point of personal philosophical bedrock is reached," to a basic ecocentrism view. As such, Deep Ecology considers several aspects as worthy of moral consideration, including humanity, nonhuman animals, and other nonhumans (see Hay, 2002). In fact, there is an idea of impartiality of participants considered, whether human or nonhuman (see Hay, 2002). Deep green theory is an elaboration on this, in which the emotional, subjective component is important, but must be checked with rational analysis (see Hay, 2002). The philosophy also advocates an "eco-impartiality," in which attributes such as "sentience and diversity" are still useful criteria in ranking value (see Hay, 2002, p. 56).

Other scholars have seen the value to the nonhuman as part of a spectrum, with the "fulcrum" for this spectrum being "the dichotomy of anthropocentrism and biocentrism" (Curran, 2005, p. 59). On the one end, the nonhuman is given no value and only humans are given value and have rights. On the other end are "holism and deep ecology," in which the nonhuman has strong Intrinsic Value (Curran, 2005, pp. 56-59).

As discussed by scholars, some advocates consider the biosphere as a single entity, namely a version of the Gaia Hypothesis, with each aspect of the biosphere playing a key role (see Curran, 2005). In fact, human beings may be "Earth's conscious mind" and, as such, have obligations to protect the biosphere (see Curran, 2005, p. 62). The Gaia Hypothesis can be seen in religious and supernatural terms, even if that was not its original intent (see Hay, 2002). The Gaia Hypothesis has been criticized for taking a supernatural and/or strong organism-centered perspective (see Kirchner, 2002). However, the existence of certain negative feedback loops which maintain some planetary homeostasis could fit with the concepts of telos and flourishing discussed above (see Kirchner, 2002).

Some have also discussed different separations beyond the Intrinsic and Instrumental dichotomy. For instance, while the intrinsic perspective seeks to give the nonhuman its value in

and of itself, some have separated this from a third category, namely the "transformational agenda" (Sewpershad, 2018, p. 27). The latter effort seeks "radical change in our way of life and the way in which we view the relationship between human beings and nature" (Sewpershad, 2018, p. 27). According to this method of articulation, Deep Ecology would fall in this third category.

Another approach of note focusses on anthropocentrism and non-anthropocentrism, with the following categories: Anthropocentric Instrumental Value, Anthropocentric Intrinsic Value, Non-Anthropocentric Instrumental Value, and Non-Anthropocentric Intrinsic Value (Turner, 2010). It is mentioned in this section as it offers some nuance and some new terminology (e.g. Inherent Value). The common category for services to humans is the Anthropocentric Instrumental Value, in which humans consider the value of nature to be based on what humans can get from it (Turner, 2010). Another category of note is Anthropocentric Intrinsic Value, which is "a culturally dependent concept [...] linked to human stewardship of nature" and "which requires a human valuer to ascribe Intrinsic value to non-human nature" (Turner, 2010, p. 1). This can also be likened to "intrinsically valuing" something, in contrast to "inherent" value (Hargrove, 1992, p. 189). The Existence Value in Ecosystem Services can be seen as adjacent to Anthropocentric Intrinsic Value (see Turner, 2010).

Non-Anthropocentric Instrumental Value simply refers to the value an aspect of nature or an ecosystem has on some other aspect of nature, regardless of humanity's input (Hargrove, 1992). For example, a plant can be of value to a specific species, without any input from humanity (Hargrove, 1992). Similar webs of Instrumental Value have been discussed by others (Brevik et al., 2020). Furthermore, this is arguably what is recognized by some as Warm Glow Ecosystem Services, although the value should exist even if humans do not recognize it (see Davidson, 2013). Non-Anthropocentric Intrinsic Value refers to something that has value in and of itself, regardless of the valuer (Hargrove, 1992). For instance, a famous painting may have Intrinsic Value, but this is based on the valuer (see Hargrove, 1992). Inherent Value, in contrast, is value beyond any valuer.

Theocentric views approach the interrelations between subjects and objects differently, and are included here for two reasons. First, the terminology of "Intrinsic Value" is sometimes used (Francis, 2015, p. 105). Secondly, some standard perspectives have been classified as theocentric (or adjacent to that category), like Leopold's Land Ethic philosophy, even if that may not have been the intention of the originators of the view (see Hoffman & Sandelands, 2004). In some Christian theocentric views, the Intrinsic Value is created through an interrelation with God, which sees humans and nonhumans as siblings, under God (Hoffman & Sandelands, 2004). God gives the aspects intrinsic meaning due to caring for them and this creates a responsibility for humans to care for the nonhuman components of creation (see Hoffman & Sandelands, 2004).

An example of such reasoning and use of the term "intrinsic" can be seen in Pope Francis' *Laudato si*', in which the love God has for the world causes it to have a value of its own (Francis, 2015). Similarly, other scholars have argued that religion is necessary to create a "valuer" and framework beyond the human in environmental ethics (Sewpershad, 2018, p. 34). Intrinsic Value cannot come from humans as the valuers, but must rely on a higher source of knowledge and perspective, including God as giver of value (Sewpershad, 2018). Other faiths, including Buddhism and Hinduism, have been touted as alternatives to an instrumental view of the environment, because of the belief that each being is related to the others, possessing an Intrinsic Value, and, thus, deserving protection and respect (Hoffman & Sandelands, 2004). Certain other non-Western epistemologies have also contested the anthropocentric view by arguing that the nonhuman animals are equal to humans. For instant, in the Mi'kmaq worldview, "humans and animals both experience our lives in the first-person, overcoming fears, having adventures, falling in love, raising families, vanquishing enemies, and having a relationship with Kisu'lk, the Creator" (Robinson, 2014, p. 674). Indigenous perspectives will be discussed throughout this thesis, particularly as the Bayano region in Panama, home to Indigenous communities, will be a key case study.

# 3.1.6 Beyond the Instrumental/Intrinsic Dichotomy: Relational Values

The concept of Relational Values is meant to transcend the Intrinsic and Instrumental Value dichotomy (Himes & Muraca, 2018). This is seen as a key concept, as some have argued that the Intrinsic/Instrumental Value framework "fails to resonate with many lay people," as people generally "consider the properties of the relationships they hold with nature rather than the inherent worth of nature itself or the benefits they derive from it in instrumental ways" (Muradian & Pascual, 2018, p. 9). Relational Values still have the link between the human and the object, but are distinct from "values as services provided by ecosystems" (Deplazes-Zemp & Chapman, 2021, p. 2). Relational Values refer to the "preferences, principles, and virtues associated with relationships both interpersonal and as articulated by policies and social norms" (Chan et al., 2016, p. 1462). These are usually framed as the relationships necessary to achieve Eudaimonia or the Good Life (Bieling, Eser, & Plieninger, 2020; Saxena et al., 2018). The Good Life is one that is satisfying and meaningful (Chan et al., 2016).

While all three types of values can fall into a general category, scholars have argued for certain distinctions between Instrumental, Relational, and Intrinsic Values (see Muradian & Pascual, 2018). Instrumental Values are considered substitutable, while the other two are not

(Himes & Muraca, 2018). It should be noted, however, that cost/benefit analysis has been argued for Intrinsic Values (Schmidtz, 2001) and the non-substitutability for some Relational Values can be considered quite weak in certain circumstances (see Deplazes-Zemp & Chapman, 2021). Both Instrumental and Relational Values refer to the link between humans and nature, while a common definition of Intrinsic Value is that the entity is an end in itself, regardless of the interactions with the human species (Himes & Muraca, 2018). Relational Values can consider more "intangible values," like care, in comparison to other methods (Bataille, Malinen, Yletyinen, Scott, & Lyver, 2021, p. 943).

As discussed by scholars, some see Relational Values as a way of avoiding the "economic valuation framework" that is often seen in the Ecosystem Services and Nature's Contributions to People frameworks (Himes & Muraca, 2018, p. 1). While all values are, by definition, relational, an argument has been made that Relational Values are a distinct and meaningful classification methodology (Himes & Muraca, 2018). In terms of all values being relational, one can consider that valuations are "neither entirely produced by the observer nor inherent to the thing" being valued (Himes & Muraca, 2018, p. 2). An example is one's native tongue, as an individual is "embedded in a non-neutral relationship with [one's] native tongue that is independent of [one's] actual preferences about it" (Himes & Muraca, 2018, p. 2). Relational Values go beyond this ubiquitous valuation, namely what can be termed the "process of valuation," to target the "content of valuation" (Himes & Muraca, 2018, p. 2). The latter includes what "is considered important and how this attribution of importance is articulated" (Himes & Muraca, 2018, p. 2). Unlike some past conceptions of nature/human relations, such as Ecosystem Services, Relational Values emphasize that value is "produced through socialecological relations and processes" (Unks et al., 2021, p. 28).

As Baard (2022) discusses, at the core of Relational Values is the move away from ascribing characteristics to objects and then seeing whether they fit our framework, but rather focusing on what relationships we want with these aspects. It is a way of becoming less detached from our external view of ethics and towards a living ethics, where "ethics becomes a part of life" (see Baard, 2022, p. 117). The argument is in essence to move from a dualist and separate way of seeing nature towards lived experiences of relationships (see Baard, 2022). Certainly, others have pointed out that Relational Values take a clear account of ethics, as in "the study of morality that refers to the norms and values that are accepted by individuals and groups and guide their behaviour" (De Vos, Joana, & Dirk, 2018, p. 89).

Some authors have made the distinction between types of values as "living from" nature for Instrumental Values, "living in" nature for Relational Values, and "living with" nature for Intrinsic Values (Deplazes-Zemp & Chapman, 2021, p. 5). While this is a simple method of categorizing relationships, others have argued the categories are more malleable (Thomas, 2020).

Relational Values are two-way relationships and can include both Instrumental and Intrinsic Values (Deplazes-Zemp & Chapman, 2021). For Instrumental Values, relationships can be a contribution to flourishing and the Good Life (Deplazes-Zemp & Chapman, 2021). For instance, natural aspects can be valued based on how they contribute to human flourishing, which incorporates Instrumental Values (Deplazes-Zemp & Chapman, 2021). Relatedly, the natural aspect can be valued itself, which is an intrinsic perspective (Deplazes-Zemp & Chapman, 2021). In fact, not only can "flourishing" be an Intrinsic Value, but the objects in the Relational Value relationships are given value in and of themselves (Deplazes-Zemp & Chapman, 2021, p. 12). As an example using a common Relational Value, "friendship" can be considered (Deplazes-Zemp & Chapman, 2021, p. 12). Such a relationship would not be meaningful if the "friend" is not valued as well (Deplazes-Zemp & Chapman, 2021, p. 12).

An individual can also have Intrinsic, Instrumental, and Relational Value to the same object (Deplazes-Zemp & Chapman, 2021). For instance, a farmer can have a specific relationship with a cow that they do not have to the other cattle in the herd (Deplazes-Zemp & Chapman, 2021). When the farmer slaughters the cow for its meat, which is its Instrumental Value, it also loses that relationship with the cow (Deplazes-Zemp & Chapman, 2021).

Another potential point of overlap between Relational Values and commonly classified Instrumental Values are Cultural Ecosystem Services, which some have argued to be essentially relational and that they don't really fit as instrumental (see Al-Afifi, 2018). Also, not only can the relationships have Intrinsic Value, but "relational values can also affect beliefs about the Intrinsic value of nature" (De Vos et al., 2018, p. 90). Relational Values are sometimes seen as pervasive in how individuals relate to nature (Knippenberg, de Groot, van den Born, Knights, & Muraca, 2018). As some argue, conservationists, and related actors, tend to describe Relational Values when discussing conservation, even above Intrinsic Value (Knippenberg et al., 2018).

Relational Values scholars have defined Eudaimonia, based on Aristotelian philosophy, as "human flourishing that is achieved through living 'a good life' in the sense of a meaningful, virtuous life" (Deplazes-Zemp & Chapman, 2021, p. 8). This goes beyond the basic needs that purely Instrumental Values can offer (Deplazes-Zemp & Chapman, 2021). It should be emphasized that in Relational Values, the relationships are themselves valued, which refers to valuing the "content" of the relationship (Deplazes-Zemp & Chapman, 2021, p. 27).

## 3.1.6.1 Indigenous views and Relational Values

Relational Values are often linked to local communities, including Indigenous communities, and may aid in understanding the "culturally-specific narratives" of such groups (Sheremata, 2018, p. 79). A potential key benefit of Relational Values is that it can better represent "non-Western languages of valuation" such as a "web of relationships" in Indigenous views (Himes & Muraca, 2018, pp. 3-4). Similarly, others have argued that conservation strategies must integrate "not only scientific approaches and methods but also Indigenous and local knowledge, cultural meanings, traditions and values" (Lliso, Lenzi, et al., 2022, p. 6). For instance, a study of Māori communities illustrated their incorporation of Relational Values, including a sense "of responsibility for the well-being of both the living and the non-living environment" (Paul-Burke & Rameka, 2015, p. 6).

Beyond the usefulness of Relational Values in understanding Indigenous perspectives, Indigenous thought has contributed substantially in shaping the scope of Relational Values. For instance, scholars have grouped a set of Indigenous philosophies under the umbrella of "Good Living" or "Buen Vivir" philosophies (Lazos-Chavero, Pawlowska-Mainville, González-Jiménez, Cantú-Fernández, & Athayde, 2023, "Values articulation" para. 1). While the prominent modern version arose in South America, "analogous concepts and associated values are widespread" among Indigenous communities and worldviews (Anderson et al., 2022, Box 2.4). Examples of Buen Vivir philosophies include Mino-bimaadiziwin for the Anishinaabeg and Sumak Kawsay for the Kichwa (Lazos-Chavero et al., 2023). Considering Indigenous Sumak Kawsay specifically, there are four key principles, namely reciprocity, oneness, connectedness, and complementarity (Waldmüller, 2014). Sumak Kawsay also seeks a community living in harmony, in this case referring to the "animacy of all things and beings who are connected through energies" (Waldmüller, 2014, p. 20). Similarly, for sub-Saharan African communities, the "relational values system of the Ubuntu philosophy" puts an emphasis on "reciprocity, dialogue, and collective humanity, which [...] extended to nature" (Anderson et al., 2022, Box 2.4). The concept of Mother Earth is key to Indigenous perspectives of Buen Vivir (see Boyd, 2017; see Lazos-Chavero et al., 2023; see Sajeva, 2017). For instance, for Sumak Kawsay, the Andean goddess of Pachamama, who embodies the creative force of the whole earth, is often invoked (see Boyd, 2017).

Scholars have described several characteristics of Buen Vivir being connected to nature and strong reciprocity (Lazos-Chavero et al., 2023). The perspectives encompass Intrinsic, Instrumental and Relational Values, with relationships being at the center of the worldviews (Lazos-Chavero et al., 2023). Other key aspects include "place-based identities [and] kinship with nature" (Anderson et al., 2022, Box 2.4).

The distinctions between Buen Vivir Indigenous views and "Western" perspectives have been discussed. In a general sense, these Indigenous views reduce the human/nature dichotomy and advocate for the lack of distinction between nature and culture (Lazos-Chavero et al., 2023). In discussions of Sumak Kawsay, this has even been seen as Indigenous worldviews overcoming the "Western" conceptions of humanity and nature (see Sajeva, 2017).

Buen Vivir can encompass several environmental and socioeconomic positions. These can include opposing the concept of perpetual economic growth and rampant capitalism (see Boyd, 2017; see Lazos-Chavero et al., 2023). It can similarly advocate against massive consumerism (see Boyd, 2017; see Sajeva, 2017).

Some have pointed out that as Buen Vivir encompasses a great variety of notions, one must be cautious in its use in rhetoric and policy (Cuestas-Caza, 2018). Similarly, others have

argued that it remains an unfortunately "fuzzy" concept (Sajeva, 2017, p. 272). Some have described three types of Buen Vivir, with only one tied directly to Indigenous perspectives (Waldmüller, 2014).

Notably, some have even cautioned that the notion of Buen Vivir can be tied to anthropocentric development, particularly when this has been argued as necessary to achieve some of its goals, including poverty reduction (Sajeva, 2017). This could even result in less environmental protection (Sajeva, 2017). Whether or not this is the case, the fact remains that Buen Vivir and Indigenous thought have played an undeniable role in environmental advocacy (see Boyd, 2017; see Lazos-Chavero et al., 2023; see Sajeva, 2017).

## 3.1.7 Relational Values Research

Research on Relational Values has been mostly qualitative, such as workshops or ethnographies, although some quantitative methods have been used (Schulz & Martin-Ortega, 2018). Quantitative methods, while requiring simplification, can help with generalized results between groups of cultures (Schulz & Martin-Ortega, 2018). Also, as some authors discuss, past quantitative studies could be useful for the understanding of Relational Values, as they deal with similar topics (Schulz & Martin-Ortega, 2018).

Methods to quantify levels of Relational Values in individuals have largely focused on interviews and questionnaires, thus gauging agreement with statements that can be linked to Relational Values (Marquina, Gould, & Murdoch, 2022; Schröter et al., 2020). One study allowed participants to write letters to trees and Relational Values were quite commonly discussed, along with more traditional Ecosystem Services (Marquina et al., 2022).

There have been efforts to create indicators for Relational Values, although this can be tricky as Relational Values "feature the interplay between biophysical and socioeconomic information" (Schröter et al., 2020, p. 51). Past research developed a framework with multiple indicators "along four [Relational Values] dimensions about people's relationships with nature" (Schröter et al., 2020, p. 51). These dimensions are "collective notions of security and sovereignty [,] health towards a good quality of life [,] held values associated with equity and justice [and] aspects of natural heritage, social identity and stewardship of the environment" (Schröter et al., 2020, pp. 51-52). Interestingly, some research found females displayed greater Relational Values than males (Kleespies & Dierkes, 2020).

Connections have been made between Relational Values and other measures of relationships to nature. Some have argued that versions of Ecosystem Services valuation methods such as Willingness-to-Pay can be useful in understanding Relational Values (Schulz & Martin-Ortega, 2018). In one study, researchers found overlap between the Connectedness to Nature Scale and Relational Values (Kleespies & Dierkes, 2020). Both Nature's Contribution to People and Ecosystem Services can connect with Relational Values, as discussed by Kadykalo et al. (2019). However, as discussed above, Relational Values have sometimes been described as an alternative to Instrumental Values (Himes & Muraca, 2018). Interestingly, research shows Relational Values can change over time and space, even throughout a lifetime (De Vos et al., 2018).

## 3.1.8 Other fields tied to Relational Values

The Relational Values perspective fits well with the social science realm of Human Ecology, which argued, even before such perspectives became prominent in environmental ethics, that the human being and the natural world cannot be held as "distinct from each other" and that social values frame interactions between the human and the environment (Saxena et al., 2018, p. 54). In fact, the fields of geography, sociology and anthropology have "long emphasized that the values defining human-environment interfaces may be understood in terms of relationships, including those linking humans to other humans; those that tie humans to non-human species and landscapes; and those that mediate the interaction between any of these entities and the divine" (Saxena et al., 2018, p. 54).

As has been argued elsewhere, there are "old-age sources" for such relational perspectives, including in Confucianism, Daoism, Buddhism, and Greek philosophy, such as in Virtue Ethics (Neuteleers, 2020, p. 2). One can certainly find examples, from these traditions, of Relational Values being used not only as something of value in themselves, but also as a means to an end. Consider the Mind Training Buddhist monk, who sits and works towards feeling compassion for all beings. This illustrates the valuable nurturing of a relationship to the outside world, while it also has a goal, namely the removal of the Self and Self-Grasping (Jinpa, 2011). As such, Relational Values can be a means to an end, but the means is also of great value.

Relational Values can also be tied to "multispecies ethnographies" or similar efforts in anthropology (see Fijn & Kavesh, 2021, p. 7). A few examples include describing the strong relations between different species, including diminishing the human/nonhuman dichotomy. For instance, Fijn and Kavesh (2021) discuss several examples, such as describing the nonhuman and human subjects together or the emotional melding of different species, such as a horse and its rider.

#### 3.1.9 Components of Relational Values

The Relational Values perspective often has a concept of "care" towards the environment (S. West et al., 2018). In fact, the Relational Value of care can fuel stewardship (S. West et al., 2018). As such, a stewardship Frame, discussed below, is linked to the concept of Relational Values. In the work of S. West et al. (2018, p. 31), which does see care as sustainable, the

authors argue concepts like "care" are "normative, subjective aspects considered to influence stewardship action." As in much of the Relational Values view when discussing meaningful relationships, care is informed by "values, meaning, emotions, preferences, and senses of attachment, connection or responsibility" (S. West et al., 2018, p. 31). Relational Values are also often tied to respect and genuine esteem for the object in the relationship (Deplazes-Zemp & Chapman, 2021).

Other potential Relational Values components that can lead to a Good Life include heritage, beauty, self-transformation, sense of place, spirituality, justice, kinship and ecoreciprocity (Washington, Piccolo, Gomez-Baggethun, Kopnina, & Alberro, 2021). Other values that have been placed as Relational Values in past research include "gratitude, friendly relations and love" (Marquina et al., 2022, p. 5). Others have seen different Relational Values at different stages of relationships, from nature being superior to humans (e.g. devotion Relational Values), nature being equal to humans, and humans as part of nature (Lliso, Arias-Arévalo, Maca-Millán, Engel, & Pascual, 2022).

Interestingly, some have discussed that a Good Life may be attainable without a relationship to nature, but that there are reasons to consider that it is beneficial to include nature (Knippenberg et al., 2018). These authors offer a few reasons why a "nature-inclusive" Good Life is generally helpful, including that, as nature is the most prominent "Other" in a person's life, meaningful relationships with this ever-present aspect are "fundamental for flourishing lives" (Knippenberg et al., 2018, p. 43). Furthermore, these types of relationships offer aspects that others can generally not, such a "growth, health, and healing" (Knippenberg et al., 2018, p. 43).
Relational Disvalues are also possible, and have been argued to be necessary to "better identify social-ecological trade-offs" (Lliso, Lenzi, et al., 2022, p. 1). This refers to aspects that impede flourishing, such as bullfighting being a "perversion of the principle of animal stewardship" (Lliso, Lenzi, et al., 2022, Figure 2).

In the end, Relational Values offer a nuanced look at the interrelations of the human and nonhuman. In the next section, the idea of "Frames," which can be made up of different relationships between humans and other aspects, will be explored. This project posits that Frames, which can thus be seen as mental models when approaching a topic or event, can also coalesce into larger categories, namely Parameters. In this thesis, the Parameters of the Impact equation, namely Population, Affluence, Technology, and Ethics will be considered, with individuals and societies emphasizing one over the other when it comes to environmental impact.

# 3.1.10 Relational Values and Frames

Frames, as they are used here, can be defined as "a natural or habitual disposition, temper, way of thinking, etc." (Oxford English Dictionary, 2022a, 20a). Similar uses have been offered by others such as it being a "mental model" that is used in approaching topics and issues (Parmley, 2009, p. 78). Frames are tied directly to Relational Values, as relationships can determine how one thinks of or approaches a topic. In this thesis, the concept of Frames is defined broadly, referring to a category made up of several Relational Values. Several Frames, including that of Conservation and Stewardship, will be utilized.

Generally, similar efforts to create and use categories of Relational Values exist (Muradian & Pascual, 2018; Pungas, 2022; Ross et al., 2018). Furthermore, scholars have discussed how the "notion of 'framing' (referring to social representations as cognitive 'frameworks') is useful to analyze socio-environmental conflicts" (Muradian & Pascual, 2018, p.10).

Some discuss several Human-Nature Relational Models, which can include Detachment and Wardship (Muradian & Pascual, 2018). Scholars have also discussed several useful typologies stemming from past researchers (Ross et al., 2018). There are several categories and each can have specific uses or connections to nature (Ross et al., 2018).

Some deal with categories extensively, particularly the different versions of Stewardship, along with others, like "Mastership of Nature" (Pungas, 2022, p. 431). Each category can have multiple relationships. For instance, one category can include views of meat, relationships with animals, and views of forests (Pungas, 2022).

It should be noted that Stewardship in this thesis is explicitly linked to Indigenous views. Stewardship, Pungas (2022) discusses, can have many definitions, some stemming from "Western" cultures. Considering the Indigenous perspective in Human-Nature Relational Models is key, as discussed by certain scholars (Arjaliès & Aguanno, 2021). As in this thesis, in their discussion of Human-Nature Relational Models, scholars have emphasized how there are "specific lenses through which human-nature relations are perceived," and people have different "cognitive frameworks" (Arjaliès & Aguanno, 2021, p. 15).

Also, as has been discussed, the "parting lines between various relational models are not always clear" (Pungas, 2022, p. 431). In the end, which are chosen can vary by study. In the case of this thesis, Frames of relationships that fit the Bayano region, based on knowledge of the region and past research, were chosen (see Horton, 2010; see Yahya Haage, 2019b). These include the Stewardship, Ethnicity and Conservation Frames. This is similar for Parameters, which can be a coalescence of different Frames. For this thesis, the Parameters in the Impact equation (Impact as a function of Population, Affluence, Technology, and Ethics) are the focus.

Other relational links between people and the world that fit well with projects like the Impact equation, which is dealt with in this thesis ("Human-Wildlife Conflicts and the Environmental Impact Equation: Creating a Version through Stakeholder Workshops and Relational Thinking"), have also been studied. For instance, in terms of environmentalism, Harrison's Narratives, namely Efficiency, which has an emphasis on better eco-technology, Equity, which emphasizes political change to achieve sustainable development, and Ethics, which target beliefs and values, are interesting Frames (see Farley, 2013). Similarly, in their application of the Impact equation, the IPAT version, Frames such as the Neo-Malthusian population growth perspective, along with several economic ways of approaching the issue of the environment, are discussed (A. K. Sharma, 2013). As such, the concepts of Frames and Parameters used in this thesis fit with similar past scholarly discussions, even when the terms are not always explicit.

It should be noted that some see these cognitive models as a first step to then identify the Instrumental, Intrinsic and Relational Values individuals hold (Pascual, 2019). This fits with the idea that there is no absolute demarcation with the three types of values, and a Good Life can incorporate all three.

## 3.1.11 Frames, Language and Rhetoric

Language and rhetoric are also key in discussions of Frames, with Frames potentially attached to specific terms and expressions used. For instance, Antal and Drews (2015, p. 1058) consider two "frames in communication," that of nature as instrumental and the interpersonal relationship Frame. They make use of specific expressions to address these Frames. For instance, the instrumental Frame is linked to expressions and terms like "natural capital," "ecosystem services," and "natural resources" (Antal & Drews, 2015, p. 1060). For the interpersonal relationship Frame, expressions such as "feelings for nature", "intimacy with nature," and "companionship with nature," are among the main ones (Antal & Drews, 2015, p. 1060). Their paper argues that using the language of relationships, such as those between humans, can act as a template for better approaches to the natural world (Antal & Drews, 2015). For instance, just as children "may show symptoms that stem from conflicts between their parents; species may be affected in ecosystems stressed by violent 'resource conflicts'" (Antal & Drews, 2015, p. 1064). The use of proper analogies and metaphors is also seen as key (Antal & Drews, 2015).

Others have also discussed how the way one interacts and talks about nature, including terminology used, impacts what one feels one can do to it (Kimmerer, 2013). This is similar to work done with Relational Values, such as with Payment for Ecosystem Services and whether protection continues after payment ends (Lliso, Arias-Arévalo, Maca-Millán, Engel, & Pascual, 2021). Statements like "Humans are a part of nature and nature is a part of us" were used to advocate for, or put individuals in mind of, a specific "relational" Frame regarding the environment (see Lliso et al., 2021, Table 2). Similarly, other research on Relational Values, specifically between individuals and trees, brought out the Frame of Gratitude and the Frame of Love (Marquina et al., 2022). Another example are the Frames dealing with nonhuman animal welfare and nonhuman animal rights. For instance, Pendergrast (2015) explored the Animal Rights Frame and the Animal Welfare Frame regarding live nonhuman animal exports, concluding that the latter was mostly discussed in the media. Terminology is key to one of the chapters of this thesis, which contains the article "Beyond Human-Wildlife Conflicts: Workshops Sought to Develop Terminology to aid in Human/Nonhuman Animal Relationships."

# 3.1.12 Cognitive Dissonance and Frames

A few examples of Frames dealing with mental conflict and cognitive dissonance can help situate the idea of Frames and their complexity. Frames that deal with relationships with the environment include the NIMBY (Not In My Back Yard) mentality, which is a mindset in which people support environmental innovations, such as the use of wind power, but are against it being implemented in their regions (Smith & Klick, 2007). Tied to this is the idea that, when thinking of local impacts of the technology, people are less favorable towards a project which they may support in theory (Smith & Klick, 2007).

A similar perspective that holds some cognitive dissonance is that of "context-sensitive thinking," which results in showing reverence to nature at one point in the day, but acting in antienvironmentalist ways at another (Nagarajan, 1998, p. 279). This has been noted when studying the daily Hindu ritual of Kolam (Nagarajan, 1998). In this ritual, auspiciousness is invited into the home and one apologizes for hurting the Earth and the Earth goddess (Nagarajan, 1998). Beyond the emotional component, the materials used in the ritual were also meant to feed wildlife (Nagarajan, 1998). The rest of the day, however, concrete environmentalist actions are sometimes not considered and many people have no problem with waste. Even though the ritual can hold much cultural and emotional meaning, it may not influence the behavior the rest of the day (Nagarajan, 1998). Furthermore, the materials used in many modern rituals cannot be ingested by wildlife, so that aspect can be lost, as well (Nagarajan, 1998).

Versions of this "dissonance" Frame are important in relation to many projects. For instance, several Campesinos in the Bayano region understand the detrimental environmental impacts that are occurring in their region but continue their environmentally detrimental actions (Duchesne & Lemoyne, 2009). As discussed by researchers, some Campesinos feel it is up to rich people, not those who are simply trying to survive from one day to another, to solve the problem (Duchesne & Lemoyne, 2009).

The concept of an institution is directly tied to Frames. An institution can be broadly defined as an "established law, custom, usage, practice, organization, or other element in the political or social life of a people" (Oxford English Dictionary, 2022b, 6a). It will be seen as expansive for this thesis, and can include religions, social movement, and political associations. Generally, a perspective similar to the Religioid view will be taken, at least in so far as including many types of institutions, from religions with strict dogma, to more loose organizations to which people belong (see Benthall, 2006). An institution can contain several Frames, as individuals tied to an institution can approach them differently. For instance, several Frames have been discussed in the world of business ethics (see Miesing & Preble, 1985).

An article in this thesis ("Frames, Omar Torrijos, and Media Documents During and After the Bayano Dam Construction Period") deals with Frames in media during and directly after the construction of the Bayano dam. These include Frames such as the Stewardship, Ethnicity and Historical Frames, which can all be held by the same institution, namely media linked to the Bayano dam. Another paper in this thesis ("The Environmental Stewardship Frame, the Role of History, and the Indigenous Communities of the Bayano Region in Panama") will also explore Frames in Bayano more generally.

#### 3.2 The Bayano region and dam

#### 3.2.1 Details on the principal study site (Bayano region)

Dam development projects can greatly affect local communities. Certainly, the flooding necessary to create a reservoir has led to unfortunate relocations of communities, often Indigenous communities (Barbara Haya, McCully, & Pearson, 2002; Colchester, 2000; FinleyBrook & Thomas, 2010; Olawuyi, 2015). For instance, in Latin America, this occurred as sites with the "largest hydropower potential" are often situated in regions inhabited by Indigenous communities (see Varas, Tironi, Rudnick, & Rodriguez, 2013, p. 68).

Dam development can cause many other negative impacts on Indigenous communities. For one, the services used from the ecosystem before it was changed by the dam can be diminished or lost (Beck, Claassen, & Hundt, 2012; Riethof, 2017). Dams can also cause harm to the cultures of Indigenous communities (Athayde, 2014; Beck et al., 2012; Riethof, 2017). The invasion of outsiders into a region, particularly if the region is opening up due to the development project, can also be a severe issue and can include social conflicts between communities (Wali, 1989b). As Indigenous cultures often necessitate local biodiversity for their lifeways, detrimental impacts can be tied to biodiversity loss (Athayde, 2014). The loss of sacred and cultural sites is a related issue (Riethof, 2017). Other issues include increasing health risks, such as due to standing water being a site for disease vectors (Beck et al., 2012).

Temporally, in Latin American development, the 1970s saw the increase in "state-led development" and many dams were built, often by nationalistic, "authoritarian regimes" (Ferradas, 2000, p. 2). The Bayano dam, in Panama, is a prime example, where the development project, whose construction ended in 1976, led to the relocation of Indigenous Guna and Embera communities (Wali, 1989b). Certainly, all the impacts discussed above have been noted for the Bayano dam (Smeaton & Rivera-Fagan, 2010; Wali, 1989b).

The main study site for this thesis is the Bayano watershed (5028 km<sup>2</sup>), which can be referred to as the Bayano region (ANAM (Ministerio del Ambiente), 2015). It belongs to the Darien region in the east, and ends, in the west, in the district of Chepo (Panama province) (Canal de Panama, 2016). The Bayano region has been the site of much past research, including

measuring changes in jungle forest cover (D. Sharma, 2015) and various impacts on Indigenous communities (IACHR, 2012b; Yahya Haage, 2019a).

The Bayano region consists of a humid tropical forest, whose range has been significantly reduced. This loss is mainly due to modern agriculture methods, cattle raising and deforestation (ANAM (Ministerio del Ambiente), 2015; Urieta Donoso, 1994). When the Bayano reservoir was created, in 1976, the region experienced significant ecological and social changes, including cultural changes, with repercussions extending throughout the decades (see IACHR, 2012b). In line with what was mentioned above, the dam has had environmental impacts, including increased algae and biodiversity loss (Wali, 1989b). Among the issues with the algal load, travel by boat has become more difficult (Wali, 1989b). The building of the dam has led to greater deforestation, as did the associated building of the Bayano bridge in 1974, which allowed outside individuals to enter the region with more ease (W. Miller, 2014).

The flooding led to the resettlement of several Indigenous and non-Indigenous communities (Wali, 1989b). The Bayano watershed is populated by non-Indigenous Campesinos, and by communities of Indigenous Embera and Guna (Wali, 1989b). The Bayano region has a key Indigenous reserve, namely Guna Madungandi (ANAM (Ministerio del Ambiente), 2015). In Panama, a reserve gives Indigenous communities the right to make decisions regarding their resources, governance, and political system (IACHR, 2012b). This reserve was established in the 1930s and the government has generally recognized this land tenure designation (Wali, 1989b). While there are Embera reserves in Panama, there aren't any in the area of Bayano. Thus, the Embera negotiated from a weaker state when it came to resettlement and compensation (Wali, 1989b). For instance, the Embera often had to deal with the Bayano Corporation, which was tasked with developing the Bayano region, rather than the Panamanian government directly (Wali, 1989b).

The Bayano hydroelectric dam's planning and construction took place from 1969 to 1976 and the relocation of the Bayano communities was implemented from 1973 to 1975 (IACHR, 2012b). The fact that the dam would be built was predetermined, so negotiations with the Bayano inhabitants dealt only with resettlement and compensation (IACHR, 2012b). The Bayano reservoir flooded around 80 percent of the Guna Madungandi reserve, and seven of ten villages (Wali, 1989a). Notably, the Guna were relocated to other parts of the Madungandi reserve, since the Guna communities were considered, by the government, to possess more ecological lifeways (Wali, 1989b). The government promised these Guna communities that their reserve would be swiftly redemarcated and that the government would work diligently to keep the region free of invading individuals (IACHR, 2012b). Ultimately, the reserve was redemarcated in 1996 (IACHR, 2012b). Unfortunately, the reserve was not sufficiently protected by the government and conflicts with Campesino invaders continue (IACHR, 2012b).

During the resettlement efforts, the Bayano Embera individuals were chiefly resettled to two towns, Ipeti and Piriati (IACHR, 2012b). Since the Embera people tend to live in small household units, they were not accustomed to living together in villages. As such, some Embera families have left the towns and resettled elsewhere in the Bayano region (Wali, 1989b). Beyond the differences in ways of life, another reason was greater proximity to their agricultural fields (Wali, 1989b). Piriati Embera and Ipeti Embera were eventually granted some land tenure recognition, by being designated collectively-owned lands, with the former receiving this status in 2014 and the latter in 2015 (Guillemette et al., 2017). Other communities, like those of the Maje Embera and Union Embera, have not received meaningful land tenure status (Guillemette et al., 2017). The Panamanian government has put in place potential methods by which these regions could receive some land tenure status (Ministerio del Ambiente, 2019), but the steps necessary are difficult to complete, partly due to the economic inputs required (Personal communication, 2023).

#### 3.2.2 Background on the Bayano Guna

Before the arrival of the Spanish to the Darien region, which overlaps Panama and Colombia, there was a population of Indigenous chiefdoms, known as the Cueva (Wali, 1989b). Their range stretched from the eastern Darien to the Bayano region (Wali, 1989b). The interaction with the Spanish decimated this population, both through conflict and illness (Wali, 1989b). This led to secondary growth in the jungle, covering the paths and structures of the Cueva (Wali, 1989b). The Guna are thought to be the remanent of this decimated population, although that is not a settled issue (Batista, Kolman, & Bermingham, 1995; Wali, 1989b). It is thought that in the seventeenth century, the group returned to the Darien, possibly from the Andes (Andersson, 2010). The Guna moved into the Bayano region and faced conflict with the Spanish (Wali, 1989b). By the middle of the nineteenth century, most Guna moved to the San Blas islands, still going to the mainland to get resources (Wali, 1989b). There were some Guna who remained on the mainland, some settling in the Bayano region (Wali, 1989b).

By the early 1900s, there were three Guna villages in the Bayano region (Wali, 1989b). New villages budded from others for several reasons (Wali, 1989b). This included an increase in population in a village or a temporary settlement nearer to agricultural land becoming a permanent settlement (Wali, 1989b). A third reason was due to a natural disaster, which could cause the site to become inauspicious or unlucky in the minds of the inhabitants (Wali, 1989b). Each Guna village was centered around the Great Meeting House, in which villagers would meet every night to discuss issues of the day (Wali, 1989b). Unlike the Embera, the Guna had a strong hierarchy, including the Sakla (Chief), the Arkar (Spokesman) and the Sualipet (Enforcement Officer) (Wali, 1989b). There could be several, ranked, Chiefs and Enforcement Officers (Wali, 1989b). The need to interact with other Panamanians led to a new position being formed, namely that of the Sikkwi or Secretary (Wali, 1989b). Relatedly, once the Madungandi reserve in Bayano was formed, it became necessary to have inter-village politics in the region, leading to the creation of the position of Cacique, as well as General Congresses, the latter taking place periodically to discuss issues regarding the reserve (Wali, 1989b).

# 3.2.3 Background on the Bayano Embera

Originally, the Embera came from Colombia into the Panamanian Darien region (IACHR, 2012b). Linguistically, they are part of the Choco, the other group being the Wounaan (IACHR, 2012b). The Choco spread in the Darien region as the Guna moved away due to conflict with the Spanish (IACHR, 2012b). In the eighteenth century, the Choco migrated to the Southeastern part of the Darien (Wali, 1989b). In terms of the Bayano region of the Darien, the Embera communities moved into the region beginning in the 1950s (Urieta Donoso, 1994). Unlike the Guna, whose communities aggregate into several villages, the Embera traditionally lived in family household units (Urieta Donoso, 1994; Wali, 1989b). Each settlement had a Noko (leader and head of family) and a Jaimbana (Shaman) (Wali, 1989b). The largest Bayano Embera settlement before the dam was Majecito, in which a charismatic leader brought together several families (Wali, 1989b). There was conflict between the Embera, the Guna and the non-Indigenous Campesinos (Wali, 1989b). There were accusation by the Guna that the Embera were hunting and stealing crops from the reserves, which the Embera denied (Wali, 1989b). The Embera had closer ties to the Campesinos and other Spanish Panamanians and were more willing to change their crops to match the needs of the market (Wali, 1989b).

# 3.2.4 Indigenous Frames in general

As the major Indigenous groups in the Bayano region have been introduced, it is key to also consider the relationships these groups, both in Bayano and the wider region of the Darien, have had with their surroundings, including the natural world and other groups of people. It is important not to consider the "Indigenous" as one uniform group, as they can vary widely, from their desires (Yahya Haage, 2019b), to their mythology and views on wildlife (Kim, 2020; Robinson, 2014). However, some argue there "is enough similarity in environmental views to warrant [a] cross-cutting approach" (Booth & Jacobs, 1990, p. 30). Nash explains the general worldview of the Indigenous people by stating that essential to "most Indian religions and ethical systems was the idea that humans and other forms of life constituted a single society" (Nash, 1989, p. 117). Similarly, Johnson (1993, p. 268) stated, regarding the Indigenous worldview, that "the natural world was a community of which we are a part, not a world of mere objects." In developing their environmental ethics field of Ohanife, Chimakonam (2017) discusses that the views of several Indigenous African groups consider all aspects of the environment as being interconnected in meaningful relationships. As they explain, everything "is connected to this community, called ecosystem, and through it; everything is connected to everything else" (Chimakonam, 2017, p. 120).

Rituals play an important role, and this can mediate views of species. In terms of community, "rituals and ceremonies reinforced the familial bonds between Indians and their environment" (Nash, 1989, p. 117). Relatedly, Antal and Drews (2015, p. 1065) point to totems representing "kinship in nature." In views somewhat similar to the Gaia Goddess Hypothesis,

Indigenous communities have a strong link to the earth, which is a living, conscious entity (Booth & Jacobs, 1990). Furthermore, this creates a sense of humility and respect for the environment (Booth & Jacobs, 1990). Notably, gratitude to nature and attachment to place are key expressions of Relational Values and can be maintained through several activities (Tam, 2022). As this section and past research demonstrate, Relational Values are particularly relevant when considering Indigenous communities (Díaz et al., 2018; J. McDonald, 2011).

While this is a standard view of Indigenous perspectives, one must make sure not to fall into the Frame of the Ecological Indian (see Kim, 2020; see Rice, 2014). Certainly, several Frames have been attached to the Indigenous peoples, including seeing them as examples of consensus social structures, which are perhaps akin to anarchism (see Clark, 2020), or as strongly liberty-focused and democratically-minded groups, as in the Iroquois Hypothesis (see Buck, 2009). However, the Ecological Indian requires some consideration when tackling the topic from a Relational Values and Frames perspective. The Ecological Indian is the idea that all Indigenous peoples and their ways of life are necessarily good for the environment (see Kim, 2020; see Rice, 2014). A related perspective is that of seeing Indigenous cultures as unchanging in time, rather than shifting, as all cultures do (Rice, 2014). These are problematic views as they see the Indigenous people as the "Other."

The opposite of the Ecological Indian is the idea that the way of life of the Indigenous peoples may be or has been sustainable, but not one of conservation. In this definition, "sustainability" is the situation where an environment can be maintained for generations (Krech III, 2005, p. 80). In contrast, "conservation" means making a concerted effort to achieve the state of sustainability (Krech III, 2005, p. 80). For instance, having a low population size may play a strong role towards sustainability, without including conservation (Krech III, 2005). This has been discussed by others, along with the related idea that conservation as a mindset may actually evolve out of a noticeable depletion of resources (Holt, 2005).

More nuanced approaches have been elaborated. For instance, the concept of Cultural Ecology considers cultural views in finer detail. Briefly, the environment and the technological aspects that are available, including beasts of burden, determine or constrain the activities a group can undertake (Steward, 2006). As such, the "cultural core" of a peoples, including some of the spiritual and political components of their society, is influenced by these activities (Steward, 2006, p. 5).

For instance, the Shoshonean Indigenous community have been used as a classic example, at least to some extent (Steward, 2008). The logic is that the environment, and the available technology, shaped important aspects of their way of life (Steward, 2008). The Shoshonean people were hunter gatherers who lived in arid regions where food was scarce and dispersed (Steward, 2008). Their general gathering was of seeds and roots and they did not have the ability to store food for long periods, which led to the groups being small nuclear family units (Steward, 2008). These family groups remained distant from their neighbors rather than developing large settlements (Steward, 2008). This was also so that competition could be kept to a minimum (Steward, 2008). They did occasionally come together, such as when necessary to hunt certain game (Steward, 2008). As they spent most time in small groups, their religious belief systems were focused on the individual (Steward, 2008). Certainly, this original Shoshonean case study seems straightforward as an example of surroundings impacting culture.

More nuanced versions tackling similar cases consider a bidirectional relationship between the environment and humans (Balée, 2006). In this view, humans impact or modify their environment, which modifies them and so forth (Balée, 2006). There is much variability, and "nature becomes influenced by cultural patterns and vice versa" (Meek & Lloro-Bidart, 2017, p. 214). It should be noted, as discussed by scholars, that such a bidirectional view was included in even early Cultural Ecology (see Williams, 2022). This included both Old World and New World communities (see Williams, 2022). In terms of the Shoshonean example, modern scholars have discussed such relationships, including one model based largely on population and demographic change (Bettinger, 1998).

Despite the growing scholarship, interactions may not always be clear. For instance, when it comes to the Indigenous communities' interactions with nature, the effects may be deceiving. For one, there is evidence that much of what people see as wilderness may in fact be consciously maintained vegetation (see Headland, 1997). This has been argued for several places, including the Amazon rainforest (see Tollefson, 2013).

When considering bidirectional change, it is useful to consider how changes in environment can also lead to changes in culture and survival, including for settlers. For instance, for the Norse in Greenland, their culture, which included a focus on cattle, sheep, and goats, became highly ineffective when the Little Ice Age arrived, particularly as the climate meant that making hay became difficult (Antunes, Banks, & d'Errico, 2012; Thomas H McGovern, 1981). Their reaction to the change in climate was inadequate, as they seem to not have varied from this type of culture (Thomas H McGovern, 1981). Looking directly at the intersection of culture and the environment, some scholars argue that the changes in climate, and thus greater reliance on a small group of individuals in their communities, led to more stratification in the Greenland Norse culture, which meant there was less room for "clumsy solutions" (Dugmore, Keller, McGovern, Casely, & Smiarowski, 2013, p. 135). "Clumsy solutions" are those that include "many different viewpoints when making a decision or establishing policy" (Dugmore et al., 2013, p. 135). As such, they offer an adaptability to environmental or cultural change. The Inuit communities were able to survive, in part due to superior technology, such as seal skin covered boats, and a maritime focus, rather than pasture land (Thomas H. McGovern, 1980). The example of the Norse in Greenland point to the complexities of interrelation of culture and the environment, and how the situations can change.

One can even narrow down and consider the variable reactions of different Indigenous communities in the region, albeit in more recent times and environmental changes. For instance, changes in the Greenland environment, starting in the 1900s, made cod less profitable than other catches. As discussed by Nuttall (2016), two communities of Indigenous groups were able to react differently, with one having the strong sense of place and dynamism so as to shift their way of life. Another community, focused on one catch, did not adapt as well (Nuttall, 2016).

In terms of Indigenous cultures shifting, there are several other notable examples. For instance, some Makah elders spoke out against the hunting of a whale species, when it was being reinstated, claiming it was no longer necessary or beneficial (see Kim, 2020). Some Indigenous scholars have gone further, using traditional stories to advocate for a cessation of hunting and eating of all animals (Robinson, 2013). Some argue that the kinship relationship between humans and nonhumans has changed, leading to new responsibilities and duties from humans (Robinson, 2013). Other Indigenous activists have also argued for such an ethos based on Indigenous views. Krásná (2022) discusses the views of several vegan Indigenous advocates. Similarly. others have discussed Indigenous individuals who have used their Indigenous perspectives to argue for vegetarianism (Grossman, 2023).

One can look more broadly at the shifts in what species are considered allowable to hunt or harvest. Many scholars have noted such relevant shifts in Indigenous individuals and communities (Aiyadurai, Singh, & Milner-Gulland, 2010; Fa, Funk, & Nasi, 2022; Hames & Vickers, 1982; Jenkins et al., 2011; Jimoh, Ikyaagba, Alarape, Obioha, & Adeyemi, 2012; Jones, Andriamarovololona, & Hockley, 2008; Lingard, Raharison, Rabakonandrianina, Rakotoarisoa, & Elmqvist, 2003; Maldonado & Waters, 2020; Saj, Mather, & Sicotte, 2006; Steinbauer, 1979; Velho & Laurance, 2013). As has also been noted, this can be linked to contact with the "Western" world or foreigners (Aiyadurai et al., 2010; Fa et al., 2022; Hames & Vickers, 1982; Jenkins et al., 2011; Jimoh et al., 2012; Lingard et al., 2003; Saj et al., 2006; Steinbauer, 1979). These are a few examples of the flexibility of Indigenous worldviews and culture as related to nonhuman animals.

While the above deals with nonhuman animals, this theme is in no way limited to that realm. More broadly, some scholars argue that being tied to the Ecological Indian Frame can limit the involvement of Indigenous people to those fitting that stereotype, excluding those seeking variable development projects (Schmitt, 2014). For instance, as discussed by some, certain groups of Indigenous individuals can also be in favor of development in their land, including extractive industries (Belzile & Moreau, 2018). The positions of Indigenous groups can therefore be very complex.

# 3.2.5 Indigenous Frames in Panama

One can turn back to the Indigenous peoples in Panama to explore the applicability of these concepts. The idea that low population led to greater environmental biodiversity may be true in terms of the Cuevan Indigenous communities, who lived in the Darien, but of which little is known. This Indigenous culture had several chiefdoms in what would become Panama, but were devastated by the Spaniards by the 1700s (Wali, 1989b). This allowed secondary forest to grow over their settlements and paths (Andersson, 2010). Similarly, in another example from

Panama, some argue the general environmental survival in the Guna Yala reserve is partly based on the fact that, culturally, the Indigenous people do not rely on tree cutting but on the use of several islands off the coast (see Mulder & Coppolillo, 2005). However, the fact that many of the inhabitants of that reserve advocated for the PEMASKY protected area suggests this was not entirely the cause for sustainability (Mulder & Coppolillo, 2005).

In terms of the environment impacting culture, this has been argued for the common migrations of the Embera in the Darien. As discussed by Hutton et al. (2017), the semi-nomadic nature of this group may be due to overhunting in a region. By migrating to another region, their prey had a chance to bounce back to necessary population sizes (Hutton et al., 2017).

Similarly, the bidirectional influence of the environment and culture can be seen for several groups. For instance, the Guna have a tradition of replanting trees so as to "not destroy the forest" (Torres & Nunez, 1995, p. 53). This is part of their agricultural cycle, allowing several years of fallow so fruit trees can grow (Wali, 1989b). As Andersson (2010) discusses, the traditional land use of the Guna required the regrowth of forest. In fact, what may appear to be undisturbed jungle may actually be a maintained ecosystem (Andersson, 2010). Similarly, a recently surveyed Bayano Maje Embera community member expressed a relevant conservation ethos by stating, regarding overfishing, that the "system used for fishing is important. We fish four days, and do not fish three days. Also, we do not fish for three months out of the year" (Personal communication, 2017).

As mentioned above, one of the reasons a community of Guna may splinter off and create a new village is due to a natural disaster in the current village (Wali, 1989b). This can make a site appear inauspicious, as well as lead to greater social conflict, resolved by splitting (Wali, 1989b). Contact with outsiders can also change Indigenous culture. For instance, greater contact with the non-Indigenous Panamanians in the early 1900s led to a new position in the Guna hierarchy, that of the Sikkwi, who could act as notetaker and intermediate between the community and outsiders (Wali, 1989b). As mentioned above, the creation of recognized reserves for the Guna also led to the development of an inter-village level of social structure, with the creation of the Cacique political position (Wali, 1989b).

Interestingly, in terms of the Embera peoples in the wider Darien, early ethnographers described many different cultural hierarchical kinship structures (see Wali, 1989b). It has been suggested this may be due to differing levels of contact with outsiders (Wali, 1989b). Similarly, the Embera people in Bayano began to organize themselves into larger settlements due to the recent regional development projects, going so far as to partly mimic the structure of the Guna (Wali, 1989b).

The formation of the Madungandi reserve also led to new rituals concerning their environmental surroundings (Wali, 1989b). Briefly, this involves the annual clearing of a path to clearly mark the boundaries of their reserve (Wali, 1989b). This endeavor takes several days, with only the women and the officers remaining in the villages (Wali, 1989b). There are several new taboos that must be observed by members and there are stories told to the village about how the reserve was obtained and their conservation duties towards it (Wali, 1989b).

There have also been some other changes in views of the environment, probably due to contact with the outside world. For instance, some of the older generation of Guna in the Guna Yala reserve have chastised some in the younger generation for not following specific guidelines that are clearly environmentally friendly, like only harvesting what is necessary (Chapin, 1995). Similarly, the younger generation in the PEMASKY reserve in Guna Yala showed less interest in protecting the forest for spiritual reasons (Mulder & Coppolillo, 2005). In Bayano, there have been tensions within Indigenous communities regarding those participating in certain professions, such as tree felling (Wali, 1989b). As discussed above, it would be naïve to argue that such changes would not occur in Indigenous communities.

In general, the Panamanian Indigenous communities show a back-and-forth interrelation between their culture and the environment. While several of their actions are based on conservation, the cultures should not be seen as unchanging or unaffected by surrounding groups.

## 3.2.6 The Omar Torrijos regime

To understand the Bayano dam, some information on Omar Torrijos, the Panamanian leader during the dam construction period, is helpful. Torrijos emerged as Panama's leader as a consequence of a coup d'état by the Panamanian National Guard in October 1968 (Munoz, 1981). Torrijos took a dual approach in the running of the nation (Wali, 1989b). On one hand, he wanted to implement "populist reforms in agrarian, social and political structures" (Wali, 1989b, p. 12). On the other hand, he strove to make the nation attractive for international funding and business (Wali, 1989b). Relatedly, he believed that megadevelopment was vital to Panama (Wali, 1989b). In fact, he saw large-scale projects as key to the proper growth of the country (Torrijos, 2000). Torrijos' approach in developing the nation "blended the socio-political views of earlier nationalist parties with an aggressive form of state-led developmentalism" (Andersson, 2010, p. 8). He set his eyes on two key projects in the Darien, namely the Bayano dam and the building of the inter-American highway segment in the region (Andersson, 2010).

Related to the above, he wanted to lead the nation towards energy independence (Gordillo & Thomas, 2013). Certainly, national development, from his view, required access to a sufficient and reliable flow of electricity (Alfredo Pérez Rodríguez, 1986). Along with heading towards energy independence, achieving Panamanian sovereignty was also vital (Wali, 1989b). The establishment of the 1977 Carter-Torrijos Treaty, which dealt with the control of the Panama Canal Zone, was seen as a key step on that path (Munoz, 1981; Wali, 1989b).

The government platform of Torrijos was dubbed Torrijismo, and put an emphasis on "equal distribution and social justice" (Scribner, 2003, p. 17). An example of its populist leanings can be seen in the 1972 Constitution, which established "worker-friendly labor laws" (Andersson, 2010, p. 22). In the educational sector, he developed a novel school curriculum and build hundreds of schools in rural areas (Wali, 1989b). Similarly, his health care reforms lead to the construction of many centers that could offer health care (Wali, 1989b). Interestingly, as scholars have discussed, this Torrijismo appeared top down rather than how these often occur, namely as "open, non-hierarchical, collective, grassroots movements" (Scribner, 2003, p. 17). Some of his social changes harmed key communities, such as farmers who fought against joining "asentamientos campesinos" (farmer settlements), a categorization supported by Torrijos (Munoz, 1981, p. 127). Also, as discussed by scholars, the populist leanings of Torrijos caused suspicion and trepidation from some in the nation, including some fearing that Torrijos' national policy would lead to communism (see Wali, 1989b).

The state felt it was its responsibility, made clear in state documents, to develop unused land, such as that in the Darien (Andersson, 2010). Land that was claimed by individuals but was laying "idle," could be seized by the government for development (Andersson, 2010, p. 23).

Regarding international funding, Torrijos achieved notable successes, including in getting funding from the World Bank for the building of the Bayano dam, which is one of the focuses of this thesis (Wali, 1989b). There were some issues, including fears that the Panama energy corporation, Fuerza y Luz, was not up to the task of distributing the energy from the potential Bayano dam, as the organization often failed to provide consistent energy (Andersson, 2010). Torrijos nationalized the corporation, which laid to rest the fears of the World Bank, on that point (Andersson, 2010). Similarly, when the dam project required more cement than was originally planned, Torrijos created a national cement company (Andersson, 2010). This type of state control drew the ire of some in his government, who wanted a true capitalist competitive state for Panama (see Wali, 1989b).

As mentioned, being open to outside finance was a goal of the state. Notably, in their overview of the economic landscape of Panama from 1968 to 1979, scholars found the strongest increases in insurance, banking, and finance (Munoz, 1981). It is interesting to note that these are segments of the economy with low direct control by the citizens of Panama (Munoz, 1981). Conversely, the economic areas with more Panamanian citizen control saw less growth (Munoz, 1981).

In 1978, Torrijos, in what was a key step for the political landscape, handed the reins to the nation to Aristides Royo ("Panama's Torrijos hands over reins," October 11, 1978). Behind the scenes, however, he was still in control (see "Panama's Torrijos hands over reins," October 11, 1978). After his 1981 death, many of his promises and commitments, including to the Indigenous peoples, had not come to pass and, in the ensuing period, did not come about. As an example, he promised the rapid redemarcation of the Guna Madungandi reserve, as well as strong protection against invading settlers, which had become a greater problem as the Bayano dam opened up the region (IACHR, 2012b; Wali, 1989b). The redemarcation only occurred in 1996 and invasions are an ongoing problem (IACHR, 2012b).

3.2.7 Past thematic and content analyses and timelines for the Bayano region

Several important thematic and content analysis studies have been done in the Bayano region. One study considered films that came out during the Bayano dam construction and discussed their themes, including portrayals of the Indigenous peoples, nationalism, and economic growth (Sylvester, 2015). Similarly, another study considered interviews of community members, using simple quantitative methods, based on frequency of discussion, to identify prominent themes (St-Laurent, 2012). Other studies considered the views of local community members regarding the environment, determining the proportion with which certain views were expressed (Duchesne & Lemoyne, 2009; St-Laurent, Gélinas, & Potvin, 2013). Similarly, a thematic analysis of recent appearances of Bayano Indigenous and non-Indigenous people in the media has been conducted (Horton, 2010). While the region linked to the Bayano dam has been studied, no focus on Relational Values has been comprehensively applied. Relatedly, no comprehensive look at the Frames and cooccurrence of Frames surrounding the dam building period has been conducted. Finally, no comprehensive review and inclusion of documents related to the dam, spanning from its construction to the present, has been conducted. From a Relational Values perspective, such efforts are interesting in understanding the situation of the Bayano dam and region. This thesis, specifically the culminating article ("Creating a Stakeholder Table, Identifying Hidden Stakeholders, Exploring Relational Interventions and Potential Reparations, for the Bayano Region of Panama"), uses these wide ranging documents as one source for a Stakeholder Table.

To determine which time segments to consider in this thesis, several documents that outline timelines for the Bayano region can be considered. For instance, past researchers created a timeline based largely on political and land use change in the region (Gordillo & Thomas,

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2013). Similarly, another timeline was created based on political change and community cooperation (Sylvester, 2015). Smeaton and Rivera-Fagan (2010) created a timeline for the region based largely on agreements and accords between the government and Bayano communities. Guillemette et al. (2017) created a timeline based on regional conflicts and land tenure changes. D. Sharma (2015) formed a socioecological timeline, which merged changes in development, such as the electrification of a region, with perceived forest cover.

Bearing in mind these past thematic analyses and timelines, the thesis article "Frames, Omar Torrijos, and Media Documents during and after the Bayano Dam Construction Period" will consider the use of Frames in media around the Bayano dam during (1969-1976) and directly after construction (1977-1981), up to Omar Torrijos' death. Being both the person in charge during construction and having to deal with the immediate aftermath, a focus on Torrijos is key to understanding the dam.

#### 3.3 Human-Wildlife Conflicts

## 3.3.1 Introduction to Human-Wildlife Conflicts

It is important to have some understanding of Human-Wildlife Conflicts (HWCs) as these can not only mediate Relational Values with nature generally, but are also key to several articles in this thesis, including the HWC Impact equation, the surveying of the Indigenous Maje Embera community, and the discussion of new terminology for the nonhuman. Certainly, biodiversity loss is a pressing problem and is predicted to worsen (Rands et al., 2010). A key concept in conservation are Human-Wildlife Conflicts, which occur "when the needs and behavior of wildlife impact negatively on the goals of humans or when the goals of humans negatively impact the needs of wildlife" (quoted in Madden, 2004, p. 248). The conflicts cover a variety of encounters, including wildlife damaging or consuming crops, preying on livestock or pets,

injuring humans, destroying machinery, and competing with humans for resources (Madden, 2004).

The species involved in HWCs vary by region and type of conflict. Most involve large, long-ranged carnivores, but HWCs can also involve other species (Distefano, 2005; Peterson, Birckhead, Leong, Peterson, & Peterson, 2010). In much of Asia, HWCs can involve elephants and tigers (Distefano, 2005). In contrast, wolves and bears are important species in Europe (Distefano, 2005; Ravenelle & Nyhus, 2017). For simplicity's sake, in this section, the term "wildlife" can be used to refer to the species involved in a particular HWC. Despite this variability, there are certain common trends in HWCs and efforts have been made to develop general lessons applicable to HWCs as an overarching concept (Madden 2004). For instance, an article in this thesis deals with developing an environmental Impact equation for HWCs.

Several types of solutions have been applied to mitigate HWCs. Some are meant to keep HWCs from occurring (Ravenelle & Nyhus, 2017). A common method is "lethal control," such as hunting. This can occur as part of a legal program or as illegal retaliatory killings (Ravenelle & Nyhus, 2017). There are also some widely-used nonlethal methods, including erecting barriers, using guard dogs, and changing behavior to avoid the wildlife (Ravenelle & Nyhus, 2017). More elaborate methods exist, including attempts to shift communities towards new livelihoods, like ecotourism (Dowie, 2009; Walpole & Thouless, 2005). These are less prone to HWCs and communities may even benefit financially from the wildlife (Dowie, 2009; Fennell, 2003; Walpole & Thouless, 2005). Some measures are applied after HWCs occur, the most common one being compensation plans where affected individuals receive financial aid (Ravenelle & Nyhus, 2017).

Human-Wildlife Conflicts are complex issues, but much revolves around perceptions and worldviews (Madden, 2004; Peterson et al., 2010). As Madden (2004, p. 250) explains, the level of public outery in HWCs "often has much more to do with perceptions of potential risk [and] lack of control over addressing the problem" than levels of loss in crops, livestock or property. Thus, shifting perceptions may help alleviate many issues in HWCs, including retaliatory killings (Madden, 2004). This is key to sections of this thesis, including the work on creating terms meant to reduce guilt placed on wildlife, while maintaining its agency ("Beyond Human-Wildlife Conflicts: Workshops Sought to Develop Terminology to aid in Human/Nonhuman Animal Relationships").

Attempts to reduce Human-Wildlife Conflicts often involve the establishment of protected areas and, as such, scholars have linked them to colonialism and its historical aftermaths (Dowie, 2009; Rastogi, Hickey, Badola, & Hussain, 2012). As some argue, the exclusionary "Protected Areas" approach was exported to developing nations along with colonialism (Lele, Wilshusen, Brockington, Seidler, & Bawa, 2010). This has historically and contemporaneously affected Indigenous communities who are often excluded from protected reserves and areas (Dowie, 2009; MacKay & Caruso, 2004). In fact, such conservation has been argued as a great threat to Indigenous communities around the world (Dowie, 2009; MacKay & Caruso, 2004). This has been seen as a reason to rethink the Protected Area way of helping wildlife (Dowie, 2009; Lele et al., 2010; Rastogi et al., 2012). Community-based Natural Resource Management and Integrated Conservation and Development Projects, in which communities are more involved in the conservation effort, have been proposed as alternatives (Rastogi et al., 2012). Some scholars point to cases where community-based conservation had detrimental effects, including when there were unequal benefits in communities (P. West & Brockington, 2006). However, there has been some success in protected areas when Indigenous communities were not relocated (P. West & Brockington, 2006). Relatedly, some scholars argue traditional Indigenous regional governance should be maintained or used as inspiration (Dowie, 2009). Similarly, some have pointed to the potential benefits of properly understanding the basics of the lifeways of Indigenous communities in protected areas (P. West & Brockington, 2006). In the end, as some have argued, the combination of conservation science and social science could be a beneficial step forward in preservation efforts (P. West & Brockington, 2006).

# 3.3.2 Focal species

In understanding the link of species to the environment, Focal species are front and center. Relationships between humans and nonhuman animals are often with Focal species. There are several different types of Focal species, including Indicator, Keystone, Umbrella, Flagship, and Emblematic species. An Indicator species is a species that can act as a surrogate/proxy "for other forms of biodiversity and/or reflect changes in ecosystem patterns and processes" (Ducarme, Luque, & Courchamp, 2013, Table 1). Keystone species are those, often top predators or "engineer species," which have "impacts on many others" (Ducarme et al., 2013, pp. 2-4, Table 1). Umbrella species are important as they have a large distribution and have wide "habitat requirements," so that protecting these species will also protect many other species (Ducarme et al., 2013, Table 1). Flagship species are those that act as symbols in conservation and can motivate protection of the habitat (Ducarme et al., 2013). Emblematic species are species that act as a symbol for a region or group (Small, 2011). Some use a more general definition for Emblematic species, as being those that "represent the biological needs of other wildlife in the area in a conservation strategy" and which are "bioindicator[s] of the general state

of their natural habitat as well as its conservation" (Guerra et al., 2011, p. 1990). Higher levels can also be included, such as Focal families, made up of key species (Caro & O'doherty, 1999).

Focusing on "species-level prioritization," Arponen (2012, p. 875) discusses several approaches when it comes to choosing which species to protect. Methods include focusing on genetic uniqueness or species distribution (Arponen, 2012). They also discuss how both Umbrella species and Flagship species can help in protecting wider biodiversity (Arponen, 2012). For instance, Flagship species can help raise awareness of the need to protect a region (Arponen, 2012). These classifications can overlap and individuals can have different relationships with the species, more often connecting to the flashier Flagship species. Some scholars have discussed four criteria that would be important when selecting a Flagship or Emblematic species, including that it can attract public attention, represents a specific ecosystem, acts as a "bioindicator of environmental conditions," and acts as an "indicator of some ecosystem stress" (Guerra et al., 2011, p. 1990). Past legends and myths involving a species can help solidify it as a Flagship species, as discussed for the giant squid (*Architeuthis*) (Guerra et al., 2011). All this may be key to the case study region in this thesis.

Perspectives on Focal species can shift through time. For instance, apex predators are seen as Keystone species in many environments now (Ducarme et al., 2013). They can be helpful in several ways, including keeping prey numbers down and even preferentially feeding on organisms that would otherwise dominate a habitat (Power et al., 1996). Such views of predators were not always the norm. Some, like the cheetah, were considered "vermin" for decades after the first national protected area was delineated in Africa (Kruger National Park in the 1890s) (Marker, Grisham, & Brewer, 2018, p. 4). Similarly, one of the earliest American attempts to reduce species loss in an environment was a decree in 1630, in the Massachusetts Bay Colony, to

actively reduce wolves to allow the species in the ecosystem to rebound (R. D. Brown, 2007). As that author explains, this was due to a mistaken belief that these top predators were responsible for the low numbers of other species in the region (R. D. Brown, 2007).

In general, species can play many roles in their relationships to the environment and humans. This must be taken into account when considering the Bayano communities and humanwildlife interactions more broadly. Interestingly, Focal species can be identified for that region, based on the articles that make up this thesis.

3.4 Introduction to the Impact equation

## 3.4.1 Background on the standard Impact equation

An article in this thesis ("Human-Wildlife Conflicts and the Environmental Impact Equation: Creating a Version through Stakeholder Workshops and Relational Thinking") deals with developing a Human-Wildlife Conflict (HWC) Impact equation, so the basics of the equation and variations can be elucidated here. Frames are ways in which individuals or social groups approach a situation, and they can be considered from a higher level, including as Parameters in the Impact equation. This conceptual equation postulates that environmental Impact (I) is a function of Population (P), Affluence (A), Technology (T), and Ethics (E) (see P. G. Brown & Garver, 2009).

Several Frames can coalesce and focus on similar variables as key to environmental change. For example, Ayn Rand, founder of the explicitly atheistic Objectivism, expressed that the environmental problem is essentially a technology problem (Rand, 1988). Interestingly, some modern Christians have also embraced the technological perspective of ecomodernists (Gray, 2021). Similarly, Dutreuil (2019) discusses how people with drastically different conceptions of nature can both come to support geo-engineering.

As some have highlighted, groups in both the political left and political right can argue for the need to reduce population size for environmental reasons (Empson & Rappel, 2021). As Human-Wildlife Conflicts are key to this thesis, it is interesting that one scholar discusses, in terms of Frames tied to elephants but with wider application, that several stakeholders can diverge but still argue for keeping the elephant population at a healthy size (Nollkaemper, 2014).

Similarly, scholars have discussed how diverse Frames, including economic opportunity, national security, Christian stewardship, and public health, can converge on the need for action on anthropogenic climate change (McCright, Charters, Dentzman, & Dietz, 2016). Edward O. Wilson (2002) discusses a similar occurrence, in which religious leaders and those with a secular worldview can converge in terms of a set of specific conservation goals, including education frameworks. In terms of more specific environmental views, some have discussed the convergence of Animal Rights and Deep Ecology, potentially developing an educational program that gives respect to the nonhuman (Kopnina & Gjerris, 2015). Finally and more generally, the Convergence Hypothesis argues that those with an Intrinsic Value Frame and those with an Instrumental Value Frame will naturally converge regarding actual policies (see McShane, 2009).

As discussed in regards to the Bayano region in Panama, in both past survey research (Yahya Haage & Lee, 2022) as well as the workshop with the Maje Embera community (Yahya Haage, 2019a), Human-Wildlife Conflicts are a key problem. As discussed by Rands et al. (2010), this is not only a global problem, but will increase with time. As such, the fact that several Impact equations have been developed, but none specific to Human-Wildlife Conflicts, is a gap in the knowledge. The Impact equation's start is attributed to Ehrlich and Holdren (1971), who initially considered per capita impact and population. The most common version is I=PAT and can act as a conceptual way of exploring "population, economic growth, and technological development" (Chertow, 2000, p. 15). The equation's variables are considered "key driving forces behind environmental change" (York, Rosa, & Dietz, 2003, p. 352).

As each Parameter is related to the other Parameters, the equation falls into the realm of Relational Values. For example, a radical decrease in population can be offset with an increase in affluence. Also, as affluence can be seen as the per capita consumption, and there is great variability in individual consumption from group to group, relationships between groups can be explored (Ehrlich, 2003). For the Technology Parameter, more efficient impact-reducing technology might leave room for growth in the other Parameters. One can thus discuss themes like how much "efficiency [must] improve to assume rates of change in population and affluence" (York et al., 2003, p. 358). Another example is to consider the Parameters of Population and Technology along with the concept of innovation. It has been argued that the relationship between population size and technology is such that the more people there are, the larger the pool of innovation in existence, which can lead to better technological solutions (see Coccia, 2014). Some have even argued that this may be a historically important connection, greatly shaping the past (Crosby, 2015). This has been explored for some scales, with the possibility perhaps being valid in only some small percentages of population growth (Coccia, 2014). Also, the link between affluence and population size is sometimes used as an argument for international development (see Shaw, 1992). As discussed elsewhere, the development of a nation's economy can lead to people wanting fewer children, so there is less fertility in the

region, and as such, population would decrease (see Shaw, 1992). This has been greatly debated, however (see Shaw, 1992).

While Relational Values tend to deal with relationships between humans and nature, the Impact equation demonstrates that this can be seen from a larger scale, by the Parameters that describe aspects of society. It must also be emphasized that the relationships can matter both in origin, namely as a means to an end, and in content, with the relationship itself having value (see Chan et al., 2018). This is a key aspect of Relational Values and is particularly relevant when Ethics is a Parameter, but also before it was included explicitly, as discussed below. While relational in nature, the Parameters do not necessarily connect through a multiplicative relationship, as other connections are possible (York et al., 2003). Considering the equation so that Impact (I) is a function of P, A, T, and E is the more realistic formulation.

There are variations on the equation. For instance, researchers have created an IMPACT equation, wherein Environmental Impact (IM) is a function of Population (P), Affluence (A), Technology efficiency (T), and an additional C variable, which describes the type of technology adopted by a nation (Jonker & Harmsen, 2012). For instance, one country could choose to focus on technology which is low in environmental impact, which would mean a low C (Jonker & Harmsen, 2012). Another may put forth technology that is very environmentally damaging, meaning a high C (Jonker & Harmsen, 2012). The benefit may be that this can act as a quasi-predictive factor.

There have been other elaborations to the equation, including a version that disaggregates Technology into "impact per unit of Consumption" and "consumption per unit of GDP" (York et al., 2003, p. 353). Other examples of variations that consider the Parameters' links and connections include combining Parameters thematically. The Parameters of Affluence and

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Technology have been joined, based on their relationships, into a Carrying Capacity component (see Bystroff, 2021). Others have extended the IPAT equation to include Behavior (B) and Government Policy (Po) (Kissinger & Karplus, 2015). Predictive models of the Impact equation have also been developed (see York et al., 2003). For the work in this thesis, however, the general relationships between Parameters was the focus. This probably made the workshops easier to work through for the participants.

#### 3.4.2 Adding the Parameter of Ethics and its link to other Parameters

The newest Parameter to the equation is that of Ethics, elaborated early on by P. G. Brown and Garver (2009). The Parameter is a key addition when one considers the Relational Values component of the equation. As has been discussed above, Relational Values can potentially deal with different moral positions, including Intrinsic and Instrumental Values (Deplazes-Zemp & Chapman, 2021). One example of a change, based on the Ethics component, is stopping industrial animal agriculture, which causes great harm (P. G. Brown & Garver, 2009). Such a move exemplifies the relationships that humans have to other sentient beings and the responsibilities humans have towards the nonhuman sentient beings.

Adding the Parameter of Ethics is not the first time the Impact equation has been connected to the field of worldviews, personal responsibilities, and moral considerations. For instance, some saw the very way the equation is set up as demonstrating the detrimental aspect that a few affluent individuals can play a massive role in overall impact (Ehrlich, 2003).

A few examples will show how ethics can be linked to the other Parameters. In fact, even when the Impact equation is not explicit, the moral relationships between the relevant aspects of society are interlinked. For instance, one's "faith" in technological achievement can play an important role and can be seen as an aspect describing a worldview. Consider the case of advocates of the Objectivist philosophy mentioned above, who are generally very certain a technological solution will arise to reduce detrimental environmental impacts (Rand, 1988). This could be seen as a subset of the Ethics Parameter or considered as part of Technology. Furthermore, some have argued that the Parameter of Technology can be an amalgamation of relationships regarding "social, economic, and political arrangement[s]" (see Ehrlich, 2003, The IPAT identity, para. 1).

Interestingly, some relationships between population size and technology can be mediated by ethical perspectives. In their discussion of the Impact equation, Parkes (2020) mentions how elements in the Religious Right, including high-ranking Catholic individuals, strenuously argued against the view that increasing population was an issue. This was linked to the contraceptive technology that was allowable and involved in changes in population (Parkes, 2020). Some used Biblical references for these views, clearly using an ethical framework to make their arguments, which considered the specific technologies that were ethically allowed (Parkes, 2020). One could argue that a recent notable example of this phenomena is Pope Francis' Laudato Si, which argues population growth should not be dealt with by the technology of contraception (Francis, 2015). In the case of that document, the ethical worldview it espouses even includes an argument that touches on environmentalism, by stating society must protect all the vulnerable, whether it be the planet's ecosystems or embryos (Francis, 2015). Finally, Compassionate Conservationists follow an ethical worldview that is affected by technological innovation, as at least some reject animal neutering and contraception, which, it has been argued, could affect conservation efforts (see Callen et al., 2020). These examples show that whether or not the Impact equation is explicit, the ethical realm can demonstrate key relationships with other components and can even have subtopics to consider.

When the Ethics Parameter is explicitly included, there are still strong links between the Parameter of Ethics and the other Parameters. As mentioned above, the Ethics component can include the need to change current agriculture and meat-production methods, as these, it is argued, cannot fit with a truly loving ethical worldview (see P. G. Brown & Garver, 2009). Such actions would, as several Animal Rights advocates discuss, mean a beneficial, but massive change, and will affect the impacts on the planet, both locally, in terms of animal husbandry technology, and internationally, in terms of deforestation and biodiversity loss (see McLeod-Kilmurray, 2012). The relationship between Ethics and the other Parameters is thus clear.

In the end, the Impact equation is a very relational perspective, and individual relationships, including between humans and wildlife, can be considered. A Human-Wildlife Conflict Impact equation, as developed in this thesis, can thus be useful in understanding these relationships.

Chapter 4 Survey with an Embera community

4.1 Introduction and citation for article

This article stems from the surveying of the Maje Embera community in 2017 and 2018. Gabriel Yahya Haage wrote all sections of the paper, except for the description of the study site, written by April Lee. Subsequent drafts were worked on by both authors. It was published and the full publication is:

Yahya Haage, G., & Lee, A. (2022). Determining the Views of the Panamanian Indigenous Maje Embera Drua on Environmental and Biodiversity Changes. *The McGill Journal of Refugee and Migration Studies*, 2(1), 1-22.

4.2 Article: "Determining the Views of the Panamanian Indigenous Maje Embera Drua on Environmental and Biodiversity Changes"

#### Abstract

The Bayano region, with the most prominent feature being the Bayano reservoir, created when a hydroelectric dam was erected in 1976, has faced much ecological and social upheaval. The reservoir flooded the lands of neighboring Indigenous Kuna and Embera groups. This led to the relocation of several Indigenous communities. This paper examines the Maje Embera Drua (community) who live along the Maje river, connected to the artificial Bayano lake. The poor quality of the lake, exemplified by abundant algae and low oxygen, directly impacts the Maje Embera's activities like transportation and fishing. Beyond the impacts of the dam, larger scale climatic changes have certainly affected the members of these communities. Past work on other communities has noted that individuals may see change in terms of unpredictability, rather than clear shifts. Does this apply to the Indigenous Maje Embera? In this paper, 21 Maje Embera were surveyed to discover whether they have noticed environmental changes in the past 10 to 15
years, what kinds of changes they noticed in terms of the duration of rainy and dry seasons as well as the timing of the start and ends of these seasons. Furthermore, individuals were asked whether they perceived changes in abundances in different types of animals, including fishes, birds and reptiles. Pearson's Chi-squared goodness of fit as well as Cochran's Q statistical tests were conducted to address these questions. The results show most participants noticed the climate changing in the last 10 to 15 years, and a significant number of participants considered the changes to be unpredictable, both in length and timing of the seasons. Most participants noticed changes in the abundances of animals and this was true regardless of the type of animal that was discussed. In summary, the Maje Embera community was well aware that there were changes, saw them as largely unpredictable, and clearly noticed changes in the abundance in many types of animals. Future studies should expand by surveying more participants from this and other communities.

# Introduction

Changes in climate and biodiversity have become a pressing problem globally. Furthermore, feeling a lack of predictability is a common concept regarding issues related to a changing climate. The impacts of climate change can be quite variable and not necessarily easily expressed by those affected. The idea that the changes in climate lead to unpredictable weather and that individuals noticed these changes has been described in several studies. For instance, in a study in Kenya on farmer adaptations to climate change, a large proportion of participants picked the category of "unpredictable precipitation" when discussing the effects of climate change. <sup>1</sup> Similarly, in research on Malawi agriculturalists, the authors cite a farmer as explaining, "[the]

<sup>&</sup>lt;sup>1</sup> Evelyn J. Mutunga, Charles K. Ndungu, and Patricia Muendo, "Smallholder Farmers Perceptions and Adaptations to Climate Change and Variability in Kitui County, Kenya," *Journal Earth Science and Climate Change* 8, no. 3 (2017).

times are changing and the rains are unpredictable, and it is good to have many crops in case maize fails."<sup>2</sup> A study on a population in Northern Ghana also pointed at unpredictability as an important factor affecting them.<sup>3</sup> In fact, unpredictable weather is the leading constraint "impeding climate change adaptation and evaluation."<sup>4</sup> The idea of climate change resulting in unpredictable change is also seen in the city. For instance, one of Steynor's et al. informants stated that "high unpredictability in weather changes" is linked to climate change.<sup>5</sup> Biodiversity loss is also a pressing problem and is predicted to worsen.<sup>6</sup> However, in many cases, people are unaware a nearby species is endangered or declining in population.<sup>7</sup> Different individuals can also have differing understandings of the level of an endangered species.<sup>8</sup> Furthermore, predominantly large and charismatic vertebrates are used in documents discussing

<sup>&</sup>lt;sup>2</sup> Rachel B. Kerr et al., "Knowledge Politics in Participatory Climate Change Adaptation Research on Agroecology in Malawi," Renewable Agriculture and Food Systems 33, no. 3 (2018).

<sup>&</sup>lt;sup>3</sup> Clifford Fagariba, Shaoxian Song, and Serge K. G. S. Baoro, "Climate Change Adaptation Strategies and Constraints in Northern Ghana: Evidence of Farmers in Sissala West District," *Sustainability* 10, no. 5 (2018), 1484. <sup>4</sup> Fagariba, Song, and Baoro, "Climate Change Adaptation Strategies," 13.

<sup>&</sup>lt;sup>5</sup> Anna Steynor et al. "Learning from Climate Change Perceptions in Southern African Cities," Climate Risk Management 27, no. 100202 (2020).

<sup>&</sup>lt;sup>6</sup> Micheal R. W. Rands et al. "Biodiversity Conservation: Challenges Beyond 2010," *Science* 329, no. 5997 (2010).

<sup>&</sup>lt;sup>7</sup> Judith Denkinger, Diego Quiroga, and Juan Carlos Murillo, Assessing Human-Wildlife Conflicts and Benefits of Galapagos Sea Lions on San Cristobal Island, Galapagos," in The Galapagos Marine Reserve: A Dynamic Social-Ecological System, eds. Judith Denkinger and Luis Vinueza (Cham, Switzerland: Springer International Publishing, 2014), 285-305; Jessica L. Fort, "Large carnivore Occupancy and Human-Wildlife Conflict in Panama" (Master's thesis, Southern Illinois University, 2016); Dinal J S Samarasinghe, "The Human-Crocodile Conflict in Nilwala River, Matara (Phase 1)," Y2A Publications (2014); Jesse Senko et al. "People Helping Turtles, Turtles Helping People: Understanding Resident Attitudes Towards Sea Turtle Conservation and Opportunities for Enhanced Community Participation in Bahia Magdalena, Mexico." Ocean and Coastal Management 54, no. 2 (2011), 148-157.

<sup>&</sup>lt;sup>8</sup> Fort, "Large Carnivore Occupancy"; Catherine M.Hill, "Conflicting Attitudes Towards Elephants Around the Budongo Forest Reserve, Uganda," Environmental Conservation 25, no. 3 (2002), 244-250.

biodiversity loss and conservation advocacy.<sup>9</sup> As such, one may ask whether a community has noticed changes in animal abundance and whether they see these changes equally in different types of animals.

Study site: The Embera and Environmental Instability

An overview of the Bayano region will give context to this research. The Bayano river region is a portion of the tropical forest zone called the Darien. The Darien is spread over both the Department of Chaco in Colombia and the Province of Panama in the Republic of Panama. More specifically, the Bayano takes up a large part of the District of Chepo, in Panama. As of 2010, the Embera are the third largest group among the Indigenous groups of Panama, residing in several regions of the nation, including the Bayano region.<sup>10</sup> While Comarcas (reserves) exist for the Embera in Panama, these do not extend to the Bayano region. Among the Embera communities heavily impacted by changes in the region, there are Ipeti, Piriati, Union, and Maje, with this study focusing on the Maje Embera Drua (community), who live along the Maje river, which connects to the artificially created Bayano lake.<sup>11</sup>

Originally, the Embera came from what is modern-day Colombia, and comprises one of the two linguistic groups of the Indigenous Choco people, the other segment being the Wounaan.<sup>12</sup> As the control of the Kuna people faded in Darien because of the Spaniards, the Choco began their

<sup>&</sup>lt;sup>9</sup> Stephen R. Keller, "Social and Perceptual Factors in the Preservation of Animal Species," in *The Preservation of Species : the Value of Biological Diversity*, ed. Bryan G. Norton (Princeton, N.J.: Princeton University Press, 1986), 50-73; Kelly K. Miller, Euan G. Ritchie, and Michael A. Weston, "The Human Dimensions of Dog-Wildlife Interactions," in *Free-Ranging Dogs and Wildlife Conservation*, ed. Matthew E. Gompper (Oxford, U.K.: Oxford University Press, 2014), 286-304.

<sup>&</sup>lt;sup>10</sup> Inter-American Commission on Human Rights (IACHR), *Kuna Indigenous People of Madungandi and Embera Indigenous People of Bayano and their Members, Panama*, 125/12, Washington, D.C., USA: IACHR, 2012.

<sup>&</sup>lt;sup>11</sup> IACHR, 2012.

<sup>&</sup>lt;sup>12</sup> IACHR, 2012.

migration into the area. However, Spanish gold mining projects subjected the Indigenous people to forced labor as well; thus, most likely in the 18th century, the Choco migrated to Southeastern Darien, where they settled in dispersed patterns.<sup>13</sup> Although the Embera did not organize around a central leader, the noko (head of the extended family) and jaimbana (shaman) were key figures.<sup>14</sup> Horticulture was important to their subsistence, and according to the study of their history by Bilbao and Kane, the people were bonded by their mythical and symbolic cosmology.<sup>15</sup>

Beginning in the 1950s, for better access to the market to sell produce, some of the Embera moved into the Bayano region.<sup>16</sup> Families were loosely scattered in the Majecito village and other sites in the region. In 1961, Jose Castillo, the head of the first Embera family that took residence in the region, brought the Embera families in the area to form a village called Majecito. The village produced corn, rice, plantains, and from the 1970s onwards, legumes and beans as well.<sup>17</sup> In 1968, at the First National Indigenous Congress of Panama, the Embera selected a Cacique (chief) for the first time, adopting the system of the Kuna.<sup>18</sup>

Land had already been sparse in the area by the time Castillo's family arrived. There had been tensions between colonists and the Kuna that had settled beforehand.<sup>19</sup> In the mid-1900s, deforestation was already a problem, although it was more local and most problematic in the

<sup>&</sup>lt;sup>13</sup> Alaka Wali, Kilowatts and Crisis Among the Kuna, Choco, and Colonos: National and Regional

Consequences of the Bayano Hydroelectric Complex in Eastern Panama (London, UK: Westview Press, 1989).

<sup>&</sup>lt;sup>14</sup> Wali, 1989.

<sup>&</sup>lt;sup>15</sup> Wali, 1989.

<sup>&</sup>lt;sup>16</sup> Alaka Wali, "In Eastern Panama, Land is the Key to Survival," *Cultural Survival Quarterly* 13, no. 3 (1989), 25.

<sup>&</sup>lt;sup>17</sup> Wali, 1989.

<sup>&</sup>lt;sup>18</sup> IACHR, 2012.

<sup>&</sup>lt;sup>19</sup> Wali, In Eastern Panama, 1989.

colonist settlements of Chepo and Canitas at the time.<sup>20</sup> On the other hand, in the 1970s, the Indigenous communities saw major upheavals with the initiation of the Bayano Hydroelectric complex project which accelerated changes in the ecological milieu. The project was conceived in 1963, and carried out for four years between 1972 and 1976.<sup>21</sup> It was decided that the upper Bayano would be flooded and the Kuna and Embera were made to relocate between 1973 and 1975.<sup>22</sup> That the dam would be built was pre-determined by the government, so negotiations with the Indigenous peoples focused on where they would be relocated.<sup>23</sup> Furthermore, the extension of the Pan American Highway of 1974 attracted new settlers, who encroached on the lands of the Embera.<sup>24</sup> The Embera land was not promptly demarcated.<sup>25</sup> Only recently did some Embera settlements receive official recognition as "collective lands". This was limited to the Pirati and the Ipeti lands, which received the new status in 2014 and 2015, respectively.<sup>26</sup>

For the reasons delineated above, the Maje Embera Drua (community) in Bayano has faced unprecedented manifestations of environmental destruction. The destruction was felt by the community, as also discussed in a workshop with Maje Embera community members.<sup>27</sup> The creation of Bayano lake has reduced the abundance of once common fish species and its

<sup>&</sup>lt;sup>20</sup> Wali, 1989.

<sup>&</sup>lt;sup>21</sup> IACHR, Kuna Indigenous People of Madungandi, 2012.

<sup>&</sup>lt;sup>22</sup> IACHR, 2012.

<sup>&</sup>lt;sup>23</sup> IACHR, 2012.

<sup>&</sup>lt;sup>24</sup> IACHR, 2012.

<sup>&</sup>lt;sup>25</sup> IACHR, 2012.

<sup>&</sup>lt;sup>26</sup> Mathieu Guillemette et al. "Building a common description of land cover in a tropical watershed plagued with intercultural conflicts: The value of participatory 3D modelling," *FACETS* 2 (2017): 195-211.

<sup>&</sup>lt;sup>27</sup> Gabriel Yahya Haage, *Developing a Child-Centered Water Poverty Index: General Guidelines and the Case Study of the Bayano Region, Panama (Version 1.0)* (Montreal, Canada: Building21, 2019).

greater algal content has made travelling on the water more difficult.<sup>28</sup> Furthermore, the opening up of the region has led to massive deforestation.

The construction of the dam was coupled with the opening of the Bayano Bridge in late 1974, and motivated the construction of a Pan-American Highway segment nearby;<sup>29</sup> both roadways accelerated logging. A report by the World Bank gives an account on the Pan-American Highway: "[the] access roads (40 km) to the dam site opened the reservoir area and its surroundings to an influx of people and uncontrolled logging took place threatening the forests and the Indigenous people which inhabited the area."<sup>30</sup> To the Maje Embera, deforestation meant a loss of territory that was vital to their way of life, including in their ethnobotany.<sup>31</sup> The Embera have lived in small kinship groups and, as such, change could be seen as unpredictable to any of their smaller settlements.<sup>32</sup> Well into the most recent decade, in addition to environmental threats, there were continued territorial disputes, numerous renegotiations over unmet promises of the government, petitions, and demonstrations.<sup>33</sup>

An important aspect that must be explored is whether the environmental issues, including the deforestation and the flooding of land in the 1970s, have had impacts for the community and how they perceive these environmental issues. Of course, standing water and illnesses like malaria, as well as water turbidity from ongoing deforestation are key

<sup>&</sup>lt;sup>28</sup> Yahya Haage, 2019; Wali, In Eastern Panama, 1989.

 <sup>&</sup>lt;sup>29</sup> Will Miller, *Historical Logging in Eastern Panama: Genesis of a Social-Ecological Landscape* (Montreal, Canada; Panama: McGill University; Smithsonian Tropical Research Institute (STRI), 2014); World Bank Group, *Panama: Vulnerability, Risk Reduction, and Adaptation to Climate Change* (Washington DC: USA: World Bank, 2011).
 <sup>30</sup> World Bank Group, 2011.

<sup>&</sup>lt;sup>31</sup> Dan Iaooster, Nathan W. Strout, and David Smith, "GIS in the jungle: Experiential Environmental

Education (EEE) in Panama," *Journal of Environmental Studies and Sciences* (2021): 1-13. <sup>32</sup> Wali, *In Eastern Panama*, 1989.

<sup>&</sup>lt;sup>33</sup> Wali, In Eastern Panama; IACHR, Kuna Indigenous People of Madungandi.

issues in such cases. It has long been known that such effects have made the waterways used by communities of the region unsanitary and difficult to navigate.<sup>34</sup> In terms of the Maje Embera Drua, they consider environmental issues as the cause of greater illness and contaminated waterways.<sup>35</sup> The microclimate of the region was changed by the creation of the dam and the deforestation it expedited; an example is average temperature increases.<sup>36</sup> Continued changes in the ecosystem, such as increasing deforestation, have been seen as environmentally detrimental by the Maje Embera community.<sup>37</sup>

# Study goals

This paper surveyed individuals of the Indigenous Maje Embera community to test whether "unpredictability" was a common understanding of climate changes in the past 10 to 15 years. After a rapport was established, participants were surveyed to determine whether they considered the changes in climate in the past 10 to 15 years as unpredictable or if they perceived a clear type of change, such as a late or early start to a season. The use of the time frame "10/15 years" was chosen so as to track general trends in people's perceptions. The intermediary for the survey agreed this would be a good approach, rather than asking participants to remember exact dates. In terms of climate unpredictability in Panama, it has been argued that "future climate will increase variability and intensity of extreme events."<sup>38</sup> As such, a scenario in which Panamanians see the changes as unpredictable is conceivable. Finally, the idea that unpredictability could be a common choice for the Maje Embera in this

<sup>&</sup>lt;sup>34</sup> Wali, 1989.

<sup>&</sup>lt;sup>35</sup> Yahya Haage, Developing a Child-Centered Water Poverty Index.

<sup>&</sup>lt;sup>36</sup> Wali, In Eastern Panama, 1989.

<sup>&</sup>lt;sup>37</sup> Yahya Haage, *Developing a Child-Centered Water Poverty Index*, 2019.

<sup>&</sup>lt;sup>38</sup> World Bank Group, *Panama*, 2011.

study is possible when one considers events such as the unprecedented flooding in 2010.<sup>39</sup> In contrast to this, however, surveyed individuals may have perceived a clearer, distinct change in their climate, such as an earlier start to the rainy season.

A loss of biodiversity and a decline of species numbers are also occurring in Panama.<sup>40</sup> As such, this paper also explores how the Maje Embera community perceives the change in the abundance of different animals, based on the type of animals considered, such as reptiles, fishes or birds. As the community members interact with and make use of animals in different ways, it is interesting to determine whether changes in numbers of certain animals was seen as more common than others. Rather than only declines in animal abundance, the more general "change in abundance" will be primarily considered since past work with the community revealed that at least some individuals have noticed increases in some species, including invasive species and species feeding on the now plentiful algae in the local water bodies.<sup>41</sup>

# Hypotheses

Several hypotheses were tested with the collected data. This study uses "climate" rather than "weather," when discussing the survey results, as informants are asked to think back to the last 10 to 15 years before deliberating a response on any trends. The time frame of 10 to 15 years was used as some participants did not remember clearly when the changes started, but knew it was around that time. All participants were at least 30 years old, except for two, who were in their twenties.

<sup>&</sup>lt;sup>39</sup> "Nacional: Afectados par inundaciones protestan." *La Estrella de Panama*. (Jan. 15, 2013).

<sup>&</sup>lt;sup>40</sup> World Bank Group, *Panama*, 2011.

<sup>&</sup>lt;sup>41</sup> Yahya Haage, *Developing a Child-Centered Water Poverty Index*, 2019.

The first section sought to understand informants' perceptions of environmental changes (rainy and dry seasons). The related hypotheses are based on the fact that it is difficult to see local environmental impacts of often global environmental problems:

H1: Participants noticed changes in the climate and related environmental areas in the past years (10/15 years).

H1 null: Participants did not notice changes in the climate and related areas in the past years (10/15 years).

H2: Regarding the timing of the rainy/dry seasons, significantly more participants will consider the change as unpredictable rather than other categories ("rainy season starting early" or "rainy season starting later"). Although the focus here is on unpredictability, this test will also simultaneously test whether the other situations are more commonly perceived.

H2 null: Regarding the timing of the rainy/dry seasons, there will be no difference between categories, namely unpredictability and other situations (changes in timing for the start of rainy or dry seasons).

H3: Regarding the duration of the rainy/dry seasons, significantly more participants will consider the change as unpredictable rather than other categories (longer or shorter seasons). Although the focus here is on unpredictability, this test will also help determine whether the other situations (duration of rainy/dry season) are more commonly perceived.

H3 null: Regarding the duration of the rainy/dry seasons, there will be no difference between categories.

Wildlife biodiversity has certainly changed and here we will consider perceptions of changes in biodiversity. In terms of changes in biodiversity, participants were presented with animal categories (fish, birds, mammals, reptiles) and were asked whether they perceived changes in abundance of these animal types. They were also asked whether there was a general increase or decrease. Maje Embera community members have elsewhere discussed both decreases and increases in specific species.<sup>42</sup>

For instance, the environmental changes have caused increases in the population of certain animals, such as birds who feed on algae.<sup>43</sup> Asking for this perceived overall change in types of animal made the survey easier to answer for the participants, and allowed a more coherent analysis for the entire sample from the studied community. A previous study in the form of a workshop with some community members argues that some members have noticed changes in abundance.<sup>44</sup> It is interesting to note whether the 21 individuals surveyed also noted changes and whether they observed changes in only a few types of animals or equally in all types. The hypothesis for this second section is based on the fact that the community

<sup>&</sup>lt;sup>42</sup> Yahya Haage, 2019.

<sup>&</sup>lt;sup>43</sup> Yahya Haage, 2019.

<sup>&</sup>lt;sup>44</sup> Yahya Haage, 2019.

interacts differently with different types of animals. As an example, community members may notice changes in fish abundance more than other types of animals. Notably, only two informants stated they were not involved in fishing. For the others, the men either fished commercially or for sustenance. Women were married to fishermen and were involved in the traditional preparation of fish for meals. As such, Hypothesis 4 can be stated as:

> H4: If participants have observed changes in abundance, there will be a significant difference in the degree of observed changes depending on the type of animal (fishes, birds, mammals, reptiles).

H4 null: If participants have observed changes in abundance, there will be no significant difference in the degree of observed changes depending on the type of animal.

### Methods

### Collecting survey data

The 21 surveys took place in summer 2017 and winter 2018 in the Maje Embera Drua. This community lives along the Maje river and routinely uses the Bayano lake and the Maje river for traveling and fishing. The survey's purpose on both occasions was to collect demographic information, information on participants' lifeways, how they used the Bayano lake and the Maje river, and their views regarding environmental changes. The survey questionnaire had both structured and semi-structured questions. In addition, any further explanations a participant might offer during a structured question were noted. The survey asked questions about demographics, links between environmental issues and social problems (illness, poverty,

hygiene, social conflict), and their perceptions of the environment. No follow-up with informants has presented itself.

In the end, 21 participants were surveyed, with attempts made, where possible, to target household heads. If there were visitors to a home during the researcher's time there, they were interviewed as well. 16 men and five women were surveyed. The survey was in Spanish and the consent document was read out to participants as literacy rate was low in the community. Certain individuals acted as intermediaries between the surveyor and the participant being surveyed. In 2017, the Cacique (chief)'s brother played this role. In 2018, it was the Cacique himself. These intermediaries helped locate individuals, offer introductions, and, if necessary, translate parts of the survey. While the intermediates were necessary in such a community, one limitation is that they may have had some influence on responses. Another limitation is that the community has a motivation to advocate for their needs during the sessions. These can include discussing the dangers of invading Campesinos (non-Indigenous Panamanians) and the need to get their land tenure recognized. In terms of the number of households surveyed, the 2017 intermediary suggested there were around 80 households in the region, but many do not live in the region permanently and so tended to be unavailable.

#### Statistical analysis

After the survey information was collected, Pearson's chi-squared goodness of fit tests were performed to test the hypotheses (using R Studio). The H null suggests there would be no significant difference between categories. Theoretically, the ratio is, for instance, 1:1:1, in which case an informant is just as likely to pick "unpredictable" or "choice two (e.g. longer rainy period)" or "choice three (e.g. shorter rainy period)"; the informant is making a random choice. If the results of the goodness of fit do not clearly indicate which direction results lean towards, post hoc methods would be performed to find which categories fit best. That way the predominant category can be identified. Along with Pearson's chi-squared goodness of fit, Cochran's Q test was also conducted for Hypothesis 4. The latter is useful as it does not have Pearson's chi-squared's assumption of independence. As it turned out, however, participants tended to be unanimous or nearly unanimous in their choices.

## Results

In terms of perceptions of climate change in the rainy/dry seasons, the null hypothesis can be rejected, as nearly all participants (20/21) noticed changes in climate in the last 10/15years (Chi-squared 17.19, df=1, p<0.0001). For changes in the timing of the rainy/dry seasons, 18 participants noticed changes and the vast majority (17/18) said the changes were "unpredictable," rather than choosing other response options ("rainy season starts earlier," "rainy season starts later"). As such, the null hypothesis can be rejected and H2 is supported (Chi-squared 30.333, df=2, p<0.0001). For H3, changes in the duration of the rainy/dry seasons, the majority of participants (12/19) chose the category "unpredictable." This is a significant difference according to the Chi-squared test (Chi-squared 11.474, df=2, p<0.01). For H4, namely, changes in biodiversity (Table 1), the null hypothesis, that there is no significant difference in observed changes in abundance across types of animals, cannot be rejected (Chi-squared 0.48649, df=3, p=0.92185). Similar results were obtained for Cochran's Q test for the 21 participants (Q=6.75, df=3, p=0.08031). Furthermore, the change in abundance for each animal category was noticed by most participants in the survey, as shown in Table 1, ranging from 21 to 17 participants. Informants who saw changes in abundance also saw general decreases in almost all categories of animals. The exception was reptiles, for

which two informants saw a general increase and one informant reported a change in abundance of reptiles, but could not say whether it was a general increase or decrease.

Category of Animal	Number of Participants who Observed Changes
Fishes	21
Birds	17
Mammals	18
Reptiles	18

Table 1: The number of participants, out of 21 total participants, who saw a change in

abundance per animal category

Discussion and conclusion

This study demonstrates that the surveyed individuals did notice environmental changes in climate in the past 10 to 15 years. Furthermore, it demonstrates that climate was seen as more unpredictable, both in timing and duration of rainy/dry seasons for the community. As stated in the introduction, this is a common view throughout the world when it comes to communities struggling with climate change.

The results of this study also suggest that outside researchers working with Indigenous individuals may find it helpful to first discuss the potential unpredictability of the changes in climate, rather than immediately attempting to gather precise participant information regarding changes to timing and duration of rainy/dry seasons. In practice, this suggests that those who want to aid such communities be aware of the views of the population, and when possible, measures should target mitigating such instability. Examples of measures that serve this purpose

in the Bayano region could be follow-ups on the government's promise of water security<sup>45</sup> and agroforestry initiatives<sup>46</sup> to secure food resources as well as shade.

This project also shows that the Indigenous community has a good grasp of the change in animal abundance, even those they may not make use of regularly. This suggests that researchers can confidently turn to Indigenous leaders for information on changes in animal abundances in a region. Some Human-Wildlife Conflict studies in Panama discuss that women may have a different, often more detrimental, view of a type of wildlife than men, who are outside the settlement every day and may see the animal in its natural habitat, often being less dangerous than it seems.<sup>47</sup> Analogous differences could be considered in terms of noticing changes in animal abundance. While we did not consider gender here, an argument could be made that not all participants encounter or use animals equally day-to-day, particularly as it is mostly a fishing community. Despite this, many noticed the changes across several types of animals. This suggests that not only direct experience, but also discussions among groups keeps them well-informed on the issue.

There are some limitations to this study. The number of surveyed individuals was low (21 participants). Future steps for this project would be to survey more individuals and separate them according to gender and age in the community. The use of a mediator and translator during the surveying could have had an impact on responses, as the mediator was a person of authority in the community. As mediators introduced the participants to the

<sup>45</sup> Megan Smeaton and Jessie Rivera-Fagan, *Reconstructing the Historical Memory of the Mesas De Concertación (Internship Report)*. Ipeti-Embera, Panama; Ancon, Panama; Montreal, Canada: The Organization of Unity and Development of the Community of Ipeti-Embera (OUDCIE); Smithsonian Tropical Research Institute (STRI); McGill University, 2010.
 <sup>46</sup> Ignacia Holmes, Kathryn R. Kirby, and Catherine Potvin, "Agroforestry within REDD +:

Experiences of an

Indigenous Embera Community in Panama," *Agroforestry Systems* 91, no. 6 (2017), 1181-1197. <sup>47</sup> Fort, Large Carnivore Occupancy, 2016.

surveyor, we cannot discount possible biases in the selected sample. Developing a relationship of trust with these communities would be helpful for future surveys, particularly when it comes to conducting surveys one-on-one. Relatedly, other nearby communities could also be surveyed. Fortunately, past research has been done with multiple communities in the region, which can be useful for further analyses.<sup>48</sup> In summary, this study helps to understand how a community of Indigenous Embera, an ethnic group who have migrated to the region across more than half a century, perceives current environmental changes, which will unfortunately increase with time. This could be generalized to other Indigenous people in this and other regions, including those who were relocated and others forced to migrate elsewhere to survive. It is therefore paramount that we understand and utilize the knowledge of communities on the frontline of climate and biodiversity change.

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<sup>&</sup>lt;sup>48</sup> Examples include Guillemette et al. *Building a Common Description of Land Cover.* 

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- 4.3 Additional discussion of the article

This article led to an understanding of the relationships between members of the Maje community and their environment. The inclusion of Indigenous views was considered important to understand needs and stakeholders. Relational Values, in which the relationships are important, are also key to these views. The article helped in developing the Stakeholder Table. For instance, the fact that surveyed individuals saw climate changes as unpredictable encouraged the inclusion of "Emergency Services" as a stakeholder.

This article also targets topics that are found in the other articles, including Human-Wildlife Conflicts, particularly the reduction of wildlife due to human encroachment, as well as the concept of Focal species. This will be discussed more in the thesis' general discussion section.

A few survey questions did not make it into the article, including some about social issues. For instance, participants were asked whether a series of community issues are linked to the loss of quality in the water of the Bayano lake and/or Maje river (Yes or No). As with the questions in the article itself, most participants agreed on the topics, mostly voting Yes: Illness (21 out of 21), Poverty (18 out of 21), Hygiene problems (21 out of 21), and Social conflict (20 out of 21). Another question asked how common certain problems are in the community (Common, Very Common, and Not Common). Most agreed that they are Common or Very Common: Illness (21/21), Poverty (19/21), Hygiene issues (21/21) and Social conflicts (20/21).

Several informants made additional comments, which help illustrate the importance they place on the water resources. For instance, one informant stated: "Without the water, one cannot live." Another made a clear statement on social problems and their source by stating that the "reason for poverty is that the state promised potable water, latrines, energy, and schools, but these projects never got here."

These comments and the questions on social impacts fit well with Relational Values and the Good Life. They also work as a lead-in to the next section, where the Good Life is explored in one of the questions as well, this time through a community workshop. Chapter 5 Workshop with an Embera community

5.1 Introduction and citation for article

This article stems from a workshop with the Maje Embera community in 2017. It was published as part of a report and the full publication citation is:

Yahya Haage, G. (2019). Developing a Child-Centered Water Poverty Index: General Guidelines and the Case Study of the Bayano Region, Panama (Version 1.0). Montreal, Canada: Building 21.

5.2 Article: "Informal Workshop with members of the Maje Embera community (Done as part of a surveying effort in 2017 and 2018)"

This workshop took place as part of a community meeting in the Maje Embera community in the Bayano region, Panama. There were 10 participants and four topic questions. The participants were tasked with discussing the topic questions among themselves and developing a few key points that were then brought to the facilitator. This methodology was chosen to try to reduce the bias of the facilitator, as the participants would have greater power in determining what they considered important. For the first two topic questions, the participants were divided into two groups. The third and fourth questions were done with the entire group. Topic Question 1: What changes in nature has your community noticed in the past decades? Response:

-In the 60s, before the dam was built, the environment was more complex. The climate was naturally maintained. At the time, the level of oxygen was right.

-Starting 15 years later (when the dam was built): There have been changes in the winter and summer. There has been an increase in illness. It became difficult to know when winter and summer will begin. The whole global system started to change.

-From around the year 2000 onwards: A lot of animals and plants started disappearing.

Topic Question 2: What are your community's main uses of Bayano lake and the Maje river and how has this been impacted by the building of the dam?

Response:

-The lake and river are commonly used, but they have become contaminated since the building of the dam.

-The main uses are fishing and transport.

-A large impact of the dam is illness. The lake has an increase in mosquitoes, which lead to illness.

-The dam caused wood and plants to get flooded and they are rotting.

-There has been a loss of fish and other animals, like camaron [shrimp].

Topic Question 3: What changes in species has your community noticed in the past decades? Response:

-In the 60s, there was a great abundance of fish, including camaron (shrimp), robalo

(snook), roncador (grunt), guacuco (catfish), and sabalo.

-There have been great decreases in these fish and others since then.

-There has been a decrease in reptiles including: Tortugas [turtles], which have low abundance and die due to deforestation. Culebras [snakes] have decreased and die due to the forests burning. -There have been some increases in certain species: -Tilapia: The first notable harvest of tilapia was in 1995. By 2000, there was an abundance of Tilapia. Around the year 2005, Tilapia abundance peaked, it is now diminished. [Tilapia is an invasive species to the region.]

-Lagarto [crocodile]: There have been increases because the government has a ban on hunting them, so it has increased.

-Cuervo [raven/crow] has increased because it likes to feed on tilapia.

Topic Question 4: What are some factors that your community needs for you to thrive? Response:

-Access to education, for children and adults.

-Better access to health.

-That the government recognizes their rights to their land.

-Being able to get the government to listen to them about their land, nature and the water. In summary, the results of this workshop demonstrate that the participants have an understanding of the impacts their region has faced in the past and continues to face. Their responses also demonstrate, perhaps unsurprisingly, that they make clear connections between the different topics. For instance, health issues are brought up both when discussing the impacts of the dam and what their community needs to thrive. Land tenure issues and power disparities are both themes that emerge from these responses. This is touched upon indirectly in some topic questions and quite directly in the last topic question. Issues that are important to water poverty are discussed in all topic questions. For instance, water contamination, loss of aquatic species, and their inability to influence the government to protect their natural and water resources are all discussed.

# 5.3 Additional discussion of the article

From a Relational Values perspective, this article aided in understanding the community's relationships to the nonhuman, as well as articulating what they felt they need for their community to thrive, akin to the Good Life. The Good Life is, of course, a key feature of Relational Values (Saxena et al., 2018). Beyond that, Relational Values were key to some of the responses. For instance, an adequate relationship with the government was seen as vital. An important component of Relational Values is that values are generally not substitutable (Chan et al., 2018), and an adequate relationship with the government would be an example of such a aspect.

This workshop also aided in identifying some stakeholders, such as educational institutions, to consider for the Stakeholder Table. As such, it helped in the development of the Stakeholder Table. In terms of the next paper, that considers Frames developed from common relationships of the Indigenous, it is partly based on the Maje Embera community, as well as other communities.

Comments from the related surveying effort also fit with key themes arising from the workshop. For instance, one participant stated that "Land titling is necessary" for the community. The workshop themes also arose in other documents stemming from the community, including from the leader of the Maje Embera who stated: "What would happen if a neighborhood in the capital, with powerful people, with a lot of money, ran out of water because others, without any legal justification, damaged their pipes? What would happen if this lasted two years and the culprits had not made any effort to repair the damage?" (Mecha, 2018, p. 3).

Education was also a key theme in the workshop. Other Indigenous advocates have expressed similar ideas. This includes the type of curriculum that is important. For instance, one

individual stated that in "the schools of San Blas [in Panama], Spanish classes should be replaced by classes in ecology, to us it is more vital" (Turpana & Nunez, 1995, p. 112).

Finally, as discussed elsewhere in this thesis, the methodology used for this workshop was meant to reduce bias from the facilitator as well as increase confidence for the participants. The hope was that future workshops with the Maje Embera community would have more interactive methodologies, but these did not take place. The 14 workshops with stakeholders involved in biology and/or environmentalism and/or sustainability were partly meant to replace these. Chapter 6 Relational Values, Frames, the Bayano region, and history

6.1 Introduction and citation for article

This paper was the result of the Innovative Ideas for Environmentalism initiative. While each member wrote their own paper, group discussions helped in other ways, like encouraging people and tracking down sources. Due to the format, there is no abstract, but the introduction section can act as an abstract. The paper should be cited as:

Yahya Haage, G. (2019). The Environmental Stewardship frame, the role of history, and the indigenous communities of the Bayano region in Panama In G. Yahya Haage (Ed.), *Innovative Ideas for Environmentalism Conference: An exploration of the Emberá, Guna, and the Bayano Region in Panama* (pp. 20-38). Montreal, Canada: Innovative Ideas for Environmentalism initiative

6.2 Article: "The Environmental Stewardship frame, the role of history, and the Indigenous communities of the Bayano region in Panama"

### **Introduction**

Indigenous groups often make use of the Environmental Stewardship frame in how they present themselves to the world (Haalboom 2011). This frame "depict[s] them as natural caretakers of the environment" (Haalboom 2011). This allows them to find allies in the larger, "Western" environmentalism movement (Haalboom 2011). (For ease, this paper will refer to this simply as the "environmentalism" movement). However, sometimes conflicts exist between the Environmental Stewardship frame and the goals, often land tenure based, of indigenous groups (Haalboom 2011).

The indigenous Guna and Embera communities in the Bayano Watershed are no exception to this. This region is home to two Guna Comarcas (Reserves), although only a small portion of

Guna Yala falls in this watershed while Guna Madugandi in found squarely in this region (see Guillemette et al. 2017).

There are also Embera Collective Lands and several communities with no recognized land tenure rights (see Guillemette et al. 2017). As Horton (2010) argues, land tenure and environmentalism are often considered together by communities in this region.

Haalboom (2011) suggested that the Environmental Stewardship frame has become less common with the indigenous worldwide, due partly to conflicts, and that there has been an increase in the use of a "Rights frame." This frame is in a sense more expansive, as it applies to the rights of different groups being equally valid, from women to minorities (Haalboom 2011). Although this egalitarian perspective is not absent in the case of the indigenous (see Mecha 2018), there is an emphasis on their specific livelihood being protected (Haalboom 2011). Thus, this frame can be considered an "Ethnicity" or "Livelihood" frame to distinguish it from the more universal, equality-centered Rights frame. In the case of certain Bayano indigenous communities, however, there are some components of their ethnicity which are downplayed in interactions with global actors and potential allies (see Horton 2010). In the case of the Bayano Guna, for instance, their closed social structure and views of superiority are downplayed (Horton 2010). In this paper, I will argue that there is a rhetorical component that is present in both the Environmental Stewardship frame and Ethnicity frame. This component is the appeal to history, both antiquity and more recent history. Furthermore, this is often done through the linking of historical or cultural figures to modern issues. This paper will explore this "history component" in various ways:

1. First, this paper will explore the use of this "history component" in cases where there is a convergence of environmentalism and the goals of the indigenous groups.

2. Then, there will be an exploration of how the "history component" becomes a key argument when there is conflict between environmental groups and the goals of the indigenous. This is often combined with claims to greater or distinct knowledge due to this "history component."

3. Then, this paper will consider how this "history component" is present in cases focused on other interactions with the "Western" world and can be quite separate from environmentalist goals.

4. Finally, this paper will explore how this "history component" has made it difficult for the Campesinos, namely non-indigenous Panamanians, to apply a similar Environmental Stewardship frame, and whether an eventual shift is likely.

# <u>Section 1: The use of history in the convergence of indigenous communities and the</u> <u>environmentalism movement.</u>

### Protected areas, land tenure and the indigenous

The inclusion of indigenous communities in environmental efforts is often considered important by conservation advocates and organizations (see Redford and Painter 2006, see Oviedo, Jeanrenaud, and Otegui 2005, see Chapin November/December 2004, see Dowie 2009). The appeal to historical antiquity and tradition is used, where possible, by indigenous groups to encourage the Environmental Stewardship frame and combine environmental efforts and land tenure goals (Haalboom 2011). The appeal to antiquity or traditional livelihood is often a logical fallacy but, in this case, there is some validity to it. After all, as is often argued, the fact that many indigenous communities have lived in regions for a long time without destroying the environment is a testament to their sustainable use of resources (Dowie 2009). Evidence of this can be seen in the fact that much of what people consider "wilderness" may in fact be consciously maintained forest vegetation. This has been argued for several places, including the Amazon rainforest (see Tollefson 2013). This is also the case in Bayano communities, including the Guna tradition to replant so as to "not destroy the forest" (Torres and Nunez 1995). Of course, some argue that low population size may play a role and that, sustainable practices or not, factors like increases in population could change social structures and lifestyles, leading to environmental degradation (see Mulder and Coppolillo 2005). Others warn against typecasting indigenous groups as unchanging and ecological instead of seeing them as fluid societies, whose actions can shift towards or against environmental goals (see Rice 2014).

The PEMASKY (Study Project for the Management of the Wildlands of Kuna Yala) conservation project is often touted as a successful cooperation between indigenous communities in the Guna Yala Comarca and conservation NGOs (Howe 1995, Mulder and Coppolillo 2005). In particular, giving the indigenous communities much of the management control is seen as evidence of their role as Environmental Stewards (Mulder and Coppolillo 2005, Howe 1995). It also helped in solidifying land tenure for the communities in Guna Yala (see Howe 1995, see Mulder and Coppolillo 2005). However, some suggest its success may be partly due to low population and the fact that the communities in Guna Yala did not substantially use the trees as part of their livelihood even before the project (see Mulder and Coppolillo 2005). In either case, the PEMASKY conservation project is an example of cooperation between indigenous communities and large conservation NGOs.

Another such convergence can be seen in the protected status of crocodiles in Panama, including in Bayano lake. This coincides well with the Guna views of crocodiles, whose killing is prohibited, a rule that is strenuously enforced (Personal Communication, 2018). Interestingly, there may now be issues with an overpopulation of crocodiles, which has been criticized by some Panamanians (Montenegro 2017). As Harrison and Dulvy (2014) suggests, this convergence can also be seen for the endangered sawfish.

The gathering of scientific data has also shown some successful cooperation between indigenous communities in Bayano and scientists. For instance, scientists from the Smithsonian Tropical Research Institute worked with an Embera community in Bayano to measure trees and help develop a forest cover map of the region in preparation for a potential conservation and carbon sequestration project (Popkin 2017).

### The Western market system and the indigenous

The market economy is often seen as a key culprit of sustainable indigenous livelihoods (see Dowie 2009). This fits with the anti-capitalism views of many environmentalists, who argue that the "crisis-ridden nature of capitalism means that it destroys external nature" (see Bergesen 1995). Even "environmental" endeavors like ecotourism have been criticized by Panamanians, including some directly involved in conservation, and by some indigenous individuals, for potentially leading to overuse of resources (see Taylor 2016). It is also seen by some as potentially leading to the loss of certain aspects of traditional culture (see Taylor 2016). The general concern is that the ancient wisdoms and ways of life are being lost by interacting with the economic markets of the West (Howe 1995). For instance, as Chapin (1995) discusses regarding the younger generation of Guna in Guna Yala, they have been affected by Western society and the economic system. As such, many younger Guna are using unsustainable harvesting practices (Chapin 1995). This is framed as a loss of ancient heritage and tradition (Torres and Nunez 1995). An appeal is also made to a venerated Guna leader of the past, who advised them that they "must only fish as necessary. We have all of the freedom to use what nature gives us, but without taking more than is essential" (Torres and Nunez 1995). Appeals to

ancient forefathers is common, including the claim that "We are deceiving our forefathers" (Lopez and Nunez 1995).

As in other such instances, these appeals to antiquity are sometimes meant to demonstrate that the indigenous group has great ecological knowledge and perspectives. For instance, the appeal to prophecy, including the foretelling, by ancient forefathers, of the immense conflict, both physical and cultural, between Europeans and indigenous Americans, clearly melds appeals to historical antiquity with an ability to access greater knowledge (see Guerrero 1995). Interestingly, a prediction by Nostradamus was also used by an indigenous poet to make a, at least metaphorical, link to the modern situation of the Guna (Turpana and Nunez 1995). The use of historical figures is prominent here as well, as when Christopher Columbus is specifically blamed for "arresting [...] the development" and leading to the stagnation of the indigenous (Lopez and Nunez 1995). Once again, individual figures of the past are used to punctuate current issues. In this case, Columbus is, at least metaphorically, equated with the colonization process, both past and present.

# <u>Section 2: The appeal to history in conflicts between indigenous views and the Western</u> <u>environmentalism movement</u>

#### Protected areas

While cooperation is highly sought, conflicts do arise in relationships between indigenous communities and the environmentalism movement. Conflicts often arise in relation to land tenure issues. As Dowie (2009) argues, the formation of protected areas can be detrimental to the access of traditional lands for indigenous groups. In fact, he sees this as one of the greatest threats to indigenous livelihoods (Dowie 2009). This is also seen throughout Panama. For instance, when Chagres National Park was established, it was outlined without considering the semi-nomadic

behavior of indigenous peoples in the area, many of whom had already been pushed out of the Bayano region with the construction of Bayano dam (Taylor 2016).

Western Environmentalists can mistrust that a protected area can include the indigenous groups living within them (Cittadino 2017). This stems from several beliefs, including "difficulties in engaging with [indigenous communities], the failure of indigenous peoples to protect the environment, and the refusal of management practices that are not based on Western science" (Cittadino 2017).

As several conservationists argue, mistrust by the indigenous towards conservation groups can be due to fears, often warranted, of large conservation NGOs working with resource extraction corporations that are threatening the indigenous territories (Dedina January/February 2005, Kostishack January/February 2005). In the Bayano region, for instance, the land tenure claims of the Maje Embera community have become stalled because the government has declared the area a protected hydrological site (Mecha 2018). This move has been criticized by many advocates, both in the Western environmentalism movement and the local indigenous communities, as being a purposeful way of reducing access by the Maje Embera to the region and allowing deforestation activities (Mecha 2018). In either case, it is undeniable that the government is using environmentalist claims to justify its actions. The Maje Embera, in turn, make reference to their forefathers and their longstanding relationship to the land to argue their case for land tenure (Mecha 2018).

It can also be difficult to have a cooperative relationship between the indigenous communities in a region and the scientists who are offering technical assistance and knowledge regarding conservation (Mulder and Coppolillo 2005). This can flow both ways as there is sometimes a fear that sharing Traditional Knowledge with outsider scientists threatens indigenous traditions (see Cittadino 2017). Interestingly, an appeal to ancient history can be used to encourage cooperation. For instance, Mulder and Coppolillo (2005) discuss how some Guna leaders used the analogy of the ancient hero, Dad Ibe (the sun), who had to befriend dangerous spirits in order to develop the knowledge to ultimately control them. Analogously, the Guna should learn the methods of Western scientists (Mulder and Coppolillo 2005). As such, appeal to historical antiquity and ancient cultural figures can also be a tool to try and reduce conflicts between environmentalists and indigenous people.

### Species conservation

Moving from protected areas to individual species, there can be clear differences between how the environment is seen as valuable by indigenous communities compared to the Western conceptions. For instance, a study with the Ipeti Embera community in Bayano found that which plants and animals were considered important was largely linked to their usefulness (Hutton et al. 2017). Specifically, flora and fauna that were routinely used were seen as more important (Hutton et al. 2017). For instance, 22 plant species were seen as important, all of which had a use (Hutton et al. 2017). A similar result was found for the animals which were considered priorities (Hutton et al. 2017). Interestingly, importance was not necessarily linked to protection. For instance, the authors discuss how an Ipeti Embera man stated that he would kill a tapir if he saw one, even though it was considered by him as "important" and by scientists as rare in the region (Hutton et al. 2017). Similarly, an anecdote from the Darien region, in which an indigenous individual killed an endangered anteater to save his dog is discussed, including how such a view may contrast with Western conceptions of environmentalism (Hutton et al. 2017). Other aspects that show a potential variation include the reason for the disappearance of species, which may not be seen as being due to human actions like overhunting, but instead in a more

cosmologically important narrative of leaving this world to replenish their numbers (Hutton et al. 2017). Interestingly, some informants on this point did see the overhunting and deforestation activities of outsiders as a cause of species loss, just not traditional hunting (Hutton et al. 2017). This again points to the "history component," as ancient and traditional hunting practices are seen positively, in contrast to modern hunting. This historical link can be even more explicit. For instance, in Kelly's (2015) study of big cat conservation in the Mesoamerican biological corridor, the author discusses how the hunting of jaguars and the ownership of their pelts is partly due to their "symbolic associations with Pre-Columbian elites, and an obvious emblem for hierarchical, sophisticated, and perhaps imperialistic Pre-Columbian civilization."

# Section 3: The "history component" in other interactions with "Western" society

# Isolationist tendencies and illness

As Horton (2010) discusses, there are certain components of the Livelihood or Ethnicity frame that are not linked to environmentalism directly and may be downplayed when the Environmental Stewards frame is promoted for indigenous communities in Bayano. This is done as these components do not necessarily fit with general Western conceptions of reality or Western values.

An example from the Bayano Guna is their isolationist tendencies (Horton 2010). As Horton (2010) argues, there is a common belief that Guna individuals who involve themselves with the outside world will increase their chances of disease. Such fear of disease is thus linked to the fears that younger generations are losing their traditional living methods (Horton 2010, Lopez and Nunez 1995). Interestingly, an appeal to history is used as a metaphor of the dangers of moving away from traditional Guna livelihoods (Lopez and Nunez 1995). For instance, the diseases brought by Europeans during colonization are likened with more modern illnesses

coming from the Western world, including AIDS, and this is further linked to a loss of traditional ways of life (Lopez and Nunez 1995). It can be argued that the Guna isolationism is understandable, considering the historical devastation these communities have faced from Western colonizers. In fact, this isolationism may be a response or at least be augmented by these interactions. As such, the isolationism is clearly linked to historical occurrences.

The Embera in the Bayano region are less isolationist, but such connections are not unknown. As Wali (1987) discusses, during the relocation due to the building of Bayano Dam, several Embera ultimately rejected an initial relocation site due to the site's perceived bad luck, manifested by community members getting sick.

### Syncretism, history and the flexibility of the Livelihood frame

Interestingly, an appeal to history can even occur when components of the Western world are incorporated by an indigenous community. Furthermore, they can be linked to the materialism that the Western world generally supports. A prime example of this is the millenarian social movement documented in the Ipeti Guna community in Bayano (Moeller 2006). It is a clear example of syncretism with Christianity and an "imminent reversal" belief system, in which those in power will soon be brought down, either becoming slaves to the Guna or killed, and the Guna people would be rewarded for their traditional ways of living (Moeller 2006). There was a strong component of materialism in this social movement, as it claimed that, after the reversal, the buildings in the cities of Panama would be turned to gold, the Guna would control the stores, and their leader would have over a dozen airplanes and houses (Moeller 2006).

The emphasis on gold is quite interesting, as the Guna have had a long historical relationship with gold. The gold industry was historically important in the development of Panama (Zimbalist and Weeks 1991, Perez-Venero 1973). Gold is also seen in Guna cosmology as a connection
between the human body and the "body" of the earth, as both are said to contain gold (Guerrero 1995). However, as the Ipeti Guna are now more affected by deforestation, this strong inclusion of gold in the reversal of fortunes may be an example of appealing to a historical conflict to frame a present conflict. Interestingly, one of the historical figures who is brought up as a sign of a degenerate person by this social movement was Midas (Moeller 1997). This inclusion could be due to the link between Midas and gold creation, as a critique of the Western people in power, who currently "control" the gold (see Moeller 1997). Specifically, those in power are, first and foremost, the "Latinos" who colonized Panama (Moeller 2006).

Considering the strong materialism in this Guna social movement, it is interesting to note that the "history component" and the appeal to ancient cultural heroes was still present and still used to justify the Guna livelihood over that of others. For instance, according to certain proponents of this view, Jesus and the Guna cultural figure of Ibe Orgun were both sent to the peoples on earth, Jesus to the Western people and Ibe Orgun to the Guna (Moeller 2006). Both taught them the proper livelihood, including their agricultural methods and social structure. However, the Western people ignored Jesus' teachings, going so far as killing him (Moeller 2006). The Guna took the teachings to heart, and are thus superior to other peoples (Moeller 2006). As with the use of historical figures to address modern issues, this movement considered the Latinos to be equal to the Jews who killed Jesus, and thus despicable (Moeller 2006).

One may argue that this movement is too distinct from the "true" indigenous Guna. This, however, may fall into the fallacy of considering the indigenous as "timeless" and unchanging cultural groups (see Rice 2014). It should also be kept in mind that the Guna livelihood, including their agricultural practices and traditional knowledge, is what makes them superior according to this social movement (Moeller 2006). As such, one can see that several of the components used in the Environmental Stewardship frame and in the more common Livelihood/Ethnicity frames are found here as well, despite the materialistic nature of this social movement. Notably, these positions are justified by an appeal to history, both in the use of cultural heroes and the link of past cultures with more recent cultures.

# Section 4: The Campesinos and the Environmental Stewardship frame

## Campesinos and environmentalism

As the past sections have shown, the indigenous communities in the Bayano region make use of the Environmental Stewardship frame. As Horton (2010) discusses, the Campesinos, namely nonindigenous Panamanians in Bayano, have generally not used this frame. Relatedly, these Campesinos have generally not linked environmentalism to the land tenure issue (Horton 2010). In discourse surrounding land tenure issues and environmental impacts in the Bayano region, the Campesinos, often called Colonos, are seen as more destructive to the environment than their indigenous neighbors. In fact, when the community relocation, due to the Bayano Dam, was being planned, the Guna were allowed to remain in the region in part because it was thought they would better protect the region's environment (Wali 1987). The Campesinos' primary economic sources of income are cattle ranching, deforestation and agricultural techniques which are distinct from the swidden and fallowing regime of indigenous groups (Wali 1987, Smeaton and Rivera-Fagan 2010). As such, their livelihoods have greater ecological impact than indigenous groups. Certainly, some research has argued that indigenous communities in the Bayano region have similar agricultural and economic techniques as the Campesinos (Simmons 1997). Generally, however, their methods are seen as quite different, with Campesinos making use of more destructive methods (Smeaton and Rivera-Fagan 2010, Wali 1989).

However, this may not be an insurmountable impediment to adopting an Environmental Stewardship frame. After all, as seen in the previous section, the Ipeti Guna millenarian social movement managed to meld the importance of its identity, including its subsistence farming, with a largely materialist goal (see Moeller 2006). Similarly, the aforementioned hydrological reserve designation in the Maje Embera region is framed as "environmental," despite its potential anti-environmental results, including encouraging greater deforestation in the region (Mecha 2018). Similarly, monoculture reforestation in the Bayano region has been framed as an environmental solution that considers pragmatic regional issues (Zanin 2005). Ecotourism has been seen as environmental by some, while unsustainable and distinct from true environmental goals by others (see Dowie 2009). This is also seen in political discourse. For instance, as Burns and LeMoyne (2001) discuss, Al Gore was often considered an "environmental" candidate, yet he supported the largely unenvironmental NAFTA accord.

Furthermore, it is interesting that studies on Campesinos' perspectives towards the environment suggest these are, on the surface, not contrary to environmentalism. For instance, in a study on the views of Campesinos, based on interviews with local members in communities found between Bayano lake and Santa Fe, the authors found that several Campesinos were aware of environmental destruction and even against it (St-Laurent, Gélinas, and Potvin 2013). Similar work also points to an interesting contradiction, namely that, despite their environmental views, the pattern of migration of Campesinos should make their unenvironmental actions clear to each member (Duchesne and Lemoyne 2009). As the authors discuss, Campesinos often migrated when the soils became unworkable in their current living locations (Duchesne and Lemoyne 2009). Somehow, such evidence was held along with a seemingly contradictory belief regarding environmental conservation. This is actually not uncommon in environmentalism. For instance,

"context-sensitive thinking" can result in a passionate and personal pro-environmental view while still performing daily unenvironmental actions (see Nagarajan 1998).

In fact, Duchesne and Lemoyne (2009) portray the "Typical Colono" as being "aware of some of the ecosystem services provided by forests but see[ing] no personal incentive in conserving them." Of course, one must not extrapolate too widely from this assessment but it is interesting that a key difference was the idea of responsibility. In the case of the Campesinos, the responsibility for environmental actions was placed on the richer citizens, not the regular individual who was trying to make ends meet, day-to-day (Duchesne and Lemoyne 2009). Such views are not unique to this case study and are seen in other environmental discourse, with the view that the majority of the responsibility for being environmental should fall on larger organizations and institutions, rather than the individual (see Eden 1993).

## Shifting towards the Environmental Stewardship frame

There may be an attempt, by several Campesino communities in the Bayano region, to shift to an Environmental Stewardship frame. For instance, "Juntos Para Protejer Nuestra Cuenca," an organization bringing together Bayano Embera, Guna and Campesinos, has as a key goal protecting the environment of the region (see Sylvester 2015). Also, of the communities surveyed in St-Laurent, Gelinas and Potvin (2013), several were coming together to work on environmental projects. Concurrently, there has also been an attempt by some Campesinos in Bayano to dispute the frame of indigenous communities as Environmental Stewards, pointing to logging contracts and other signs of unenvironmental activities (Horton 2010).

So far, the Campesinos have not managed this frame shift and a look at the rhetoric reveals the frame most associated with them is that of the "Poor Panamanian," who must do what he must to survive (Horton 2010). Other research has also seen this as a justification even among those who

are environmentally conscious (Duchesne and Lemoyne 2009). Relatedly, there is a sense of individualism attached to the Campesinos (see Wali 1987). The use of private property rather than the communal arrangements of the indigenous communities may play a role here as well. Notably, as St-Laurent, Gelinas and Potvin (2013) state regarding Campesinos, "organized groups and dynamic projects are believed by respondents to increase environmental awareness and to provide incentives for forest conservation."

The lack of an appeal to history may play an important role here. If there is only a weak sense of community or ethnicity for these groups, it makes it difficult to draw on a shared distant history to support an Environmental Stewardship frame similar to the Bayano indigenous. This is particularly notable as the Bayano Embera began migrating into the region only in the 1950s, around the time the Campesinos also started arriving (Wali 1987). However, the Embera had a strong ethnicity and history to draw from and apply to the natural world around them. This is seen, for instance, in the spiritual and ecological importance put on local "Arboles Madre" (Mother Trees) in the region (Mecha 2018).

Once again, a similar task is not insurmountable for the Campesinos. The creation or link to a distant past in America has been argued by some Western social movements (Voss 1987). In fact, moving beyond the Americas, links can even be made to an imaginary or metaphorical past (Voss 1987). In the case of the Campesinos, however, the "history component" actually works against them, as they are seen as the "invaders" to the region, bringing with them their unsustainable Western cattle-based lifestyles (Horton 2010, Smeaton and Rivera-Fagan 2010). In fact, Campesinos are often referred to a Colonos, a term stemming from their "colonization" of the region (Horton 2010). In the end, this historical label would have to be discarded by the general population before a more conducive appeal to history could be made.

#### **Conclusion**

In conclusion, it is clear that appeals to history, including historical antiquity and historical figures, is a common component in the rhetoric of the indigenous communities of the Bayano and indigenous communities more generally. This is often done by creating links between historical events or figures and present contexts. This is seen in cases where Western environmentalism and indigenous goals converge, with this appeal to history supporting the Environmental Stewardship frame. It is also prominent in cases where the goals of environmentalism clash with indigenous perspectives. Moving beyond specific environmentalist goals, this "history component" is seen in other interactions between the Western world and indigenous communities, as illustrated by the isolationist perspectives of some communities. Furthermore, this "history component" can remain in cases of strong incorporation of Western ideas, even when goals appear entirely contrary to environmentalism. Finally, the Campesinos in Bayano have failed to apply the Environmental Stewardship frame to themselves, potentially due to a lack of a strong historic background to draw from. Future studies on indigenous communities and the use of frames must consider this "history component," as it is common across many frames and perspectives.

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## 6.3 Additional discussion of the article

This paper, which explores common Frames in the Bayano region, is an example of a "higher" level of "Relational Values," in which relationships can lead to specific ways of framing issues and situations. The paper includes key themes discussed in other documents and the literature review, including the idea of the Ecological Indian. Specifically, by considering when Indigenous groups' needs do or do not coincide with "Western" environmentalism, a more nuanced approach to helping Indigenous communities can be sought. In terms of the final Stakeholder Table, this paper, along with the 14 workshops discussed in two other chapters, argued for distinctions between "Western" and Indigenous stakeholders, such as for the concept of "spiritual ecosystems" versus "scientific ecosystems" as stakeholders. In fact, regarding these concepts, simply considering Intrinsic and Instrumental Values can miss some nuance that is captured by Frames and the relationships they contain. After all, those who have a "Western" environmental Frame and those with the Identity Frame can hold the ecosystem as intrinsically valuable, but they may differ in specific relationships. This is discussed further in this thesis' general discussion section. In the end, both should be included in a Stakeholder Table and when seeking an understanding of the region.

Considering the process that gave rise to this article, namely the Innovative Ideas for Environmentalism initiative, there is a clear Relational Values component. The participants were encouraged to select topics towards which they felt a strong sense of curiosity (or a similar emotion). This is in contrast to much writing in academia, which is often focused on what would be acceptable to a professor, supervisor or academic journal. As such, the hope was to nurture a strong relationship between participant and topic, so as to develop articles that are both meaningful to the writer and of high quality. The papers may not fit the layout of standard articles, but they can still be important expressions of ideas and concepts for the Bayano region and beyond.

This article is connected to the article (in chapter 7) on Frames occurring and cooccurring during the Bayano dam construction and direct post-construction period ("Frames, Omar Torrijos, and Media Documents during and after the Bayano Dam Construction Period"). While the current paper takes a wide range for its exploration of Frames, the Torrijos-era paper zeroes in on a specific timeframe and on media documents. These are, in a way, two approaches to talk about similar topics and regions. The article on the Human-Wildlife Conflict and the Impact equation is also strongly linked to this one, as the Parameters of the equation, such as Technology, can be seen as the convergence of several Frames.

Chapter 7 Relational Values, Frames and the Bayano region seen through media documents 7.1 Introduction and citation for article

This article brings back the concept of Frames, which are made up of several relationships. It can be cited as:

Yahya Haage, (2022). Frames, Omar Torrijos, and Media Documents during and after the Bayano Dam Construction Period. [to be submitted to *Energy Policy*]

7.2 Article: "Frames, Omar Torrijos, and Media Documents during and after the Bayano Dam Construction Period"

## <u>Abstract</u>

The 1970s saw a great surge in Neotropical development projects and the Bayano dam in Panama, constructed under Omar Torrijos, is a clear example. In discussions of such projects, rhetorical Frames are commonly utilized. In discussions of the Indigenous communities, for example, the Stewardship Frame and Ethnicity Frame are key. This paper conducted a thematic analysis of documents related to the Bayano dam during the construction (1969-1976) and the post-construction Torrijos era (1977-1981). Media documents (35 in the construction period and 23 in the post-construction period) were coded to note discussions that used the following Frames: Stewardship, Conservation, Ethnicity, Historical, and Economic. To find which Frames occurred together a Jaccard index was performed. Also, for the two most common Frames, Economic and Conservation, Fisher's exact tests of independence were performed to determine whether the proportions of the Frames varied from the construction (1969-1976) and the postconstruction (1977-1981) period. The results failed to detect significantly more discussions in the Economic Frame when comparing segments of time (p=0.237). There was a similar lack of change in the Conservation Frame of discussion (p=0.124). Other results include that, for the second time segment, Stewardship did not cooccur with the Ethnicity, History or Economics Frames. In contrast, Ethnicity/Conservation and Ethnicity/History were ranked in the two top spots in the second time segment (1977-1981). The results suggest a shift towards a focus on the preservation of Indigenous ways of life, rather than the idea of Indigenous communities as stewards of nature. A theme that arose from the thematic coding was the Noah 2 project, which worked to save animals from the rising reservoir waters. This occurred in 48% of all documents. Future studies could investigate this topic further and apply the Frames to other locations and times.

## **Introduction**

State-sponsored development projects were common in the 1970s in the Neotropics (Ferradas, 2000). This often had impacts for Indigenous communities (Varas, Tironi, Rudnick, & Rodriguez, 2013). The Panamanian Bayano dam, finalized in 1976, is a clear example. The project led to the relocation of Indigenous and non-Indigenous communities (Wali, 1989b). Thematic analysis of historical development projects, including dams, can help understand the situation better. As discussed regarding the Bayano region, considering themes can elucidate changes in the region, including the intent and focus of those involved (Sylvester, 2015). Thematic analysis of news media documents related to the Bayano dam can help understand the historical period and the changes through time.

Several Frames can be used in documents that discuss development projects. Based on the definition of Nelson, Oxley and Clawson (1997), a Frame "has been depicted as the process by which a source (a newspaper or television news story, or perhaps a single individual)" defines the aspects underlying a "social or political issue." This is certainly the case when arguments are made to not relocate Indigenous communities or to give land tenure status to Indigenous groups (Haalboom, 2011). As discussed elsewhere, Frames common to Indigenous arguments include the Stewardship Frame and the Rights Frame (Haalboom, 2011). The Stewardship Frame argues that Indigenous communities are good stewards for environmentally important regions (Haalboom, 2011). This is one of the "positive" framings associated with Indigenous communities (Tyson, 2008). Essentially, their ways of life are consistent with environmental protection (Haalboom, 2011). As discussed in regards to the Bayano Indigenous communities, "environmentalists came to see [the Indigenous communities] as the 'front-line' defenders of the fragile ecosystem" (Wali, 1989b).

Another common Frame in discourse, in many documents, is the Rights Frame, which focusses on the necessity to protect the rights of a group, such as women, the LGBT communities, and Indigenous communities (Haalboom, 2011). For the Indigenous communities, the Rights Frame focuses on their being allowed to maintain their ways of life, as their loss violates Indigenous rights (Haalboom, 2011). As discussed elsewhere, this could be better understood as an Ethnicity Frame, to focus on the ethnic identity components of the community (Yahya Haage, 2019b).

Other Frames can also be found in documents dealing with environmental impacts and projects. In fact, past research on the Bayano dam has also pointed to another Frame. For instance, in an in-depth study of the area, a researcher demonstrated that the economic development of several Panamanian regions was greatly discussed by Torrijos and other people in power (Wali, 1989b). In fact, a thematic analysis of films during the Bayano construction period demonstrated that the Frame of "Economic Growth" was common in the region this paper focuses on (Sylvester, 2015). Relatedly, Antal and Drews (2015) discuss several "communication frames," along with the analogies and metaphors that are linked to them, which

include an "instrumental" frame or an "interpersonal frame" towards nature. They also highlight the use of economic progress as a category, which was considered a Frame in this article (see Antal & Drews, 2015).

Another key Frame is the Conservation Frame, which can be defined as a Frame that discusses the conservation of a region, species, ecosystem or animal. Past documents demonstrate there were discussions of various environmental issues that would fit with this Frame both during construction (e.g. Hanbury-Tenison, 1973) and directly after construction (e.g. Instituto de Recursos Hidráulicos y Electrificación, 1978). As such, it was a topic that had to be included.

As discussed elsewhere, a component that can be found in many Frames linked to Bayano is the History Component (Yahya Haage, 2019b). This can include the use of past events, including colonization and battles, as well as cultural heroes. For instance, Indigenous writers from the Guna Yala reserve make references, in testimonials, to cultural heroes, past colonization of the regions, and western figures, to discuss the Western impact and influence in Indigenous life and regions (Moeller, 2006; Turpana & Nunez, 1995). In the Bayano reserve of Guna Madungandi, some members have also made use of cultural heroes to support the importance of their ways of life (Moeller, 2006). History could also be tied to non-Indigenous groups, making reference to cultural heroes or national battles. For instance, in modern discourse, Venezuelan president Maduro used the memory of a national saint and cultural figure to support a Covid-19 treatment (Andrade, 2021).

This historical component can be considered a Frame as well, as it can be a lens through which a document can be placed, even if the other Frames are absent. For instance, a document could make use of history, without linking it directly to economic growth, environmentalism or

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the Indigenous communities as stewards of the land. The "Historical Frame" was thus considered as its own entity, although it could coincide with other Frames.

In fact, generally, several Frames can occur together, as discussed in terms of humans and automotive travel (see Sovacool & Axsen, 2018). This article considered this by trying to determine when these key Frames cooccurred.

The Frames considered in this research were thus the Stewardship Frame, the Ethnicity Frame, the Historical Frame, the Conservation Frame, and the Economic Frame. The Frames could appear within a text regardless of whether it was being critiqued, such as criticizing economic growth or that the Indigenous communities are good stewards. For the latter, for instance, some have discussed the suggestion that having a low population could be misinterpreted as active stewardship (see Mulder & Coppolillo, 2005). As mentioned above, a document could contain more than one of the Frames. For instance, an article may have taken the claim that the Indigenous communities are stewards of the land, while using their history to make their case. Even economic growth could be considered alongside stewardship as has been argued by some Christian groups (see Martin, 2009). In terms of Indigenous groups, other scholars have discussed the tensions, even within groups, regarding positions on life ways and their connections to new business and economic ventures (Wali, 1989b). As another example, the development of the Bayano dam required relocation in the hopes, by the government, of achieving economic growth, but the Guna were still considered stewards of the environment (Wali, 1989b). As such, they were relocated to within their reserve, in the hopes their ways of life would help protect the ecology of that region (Wali, 1989b).

Past rhetoric has also shown that the Economic and Conservation Frames are not always seen as antagonistic. For instance, historically, there have been arguments for increasing economic growth while increasing potential conservation, as in a previous popular belief that cutting trees allowed for increasing overall amount of timber and trees (Nyyssönen, 2022). In Bayano, increases in the economic sector, such as tourism, could aid in making a better life for the Indigenous communities and bring help to expand their cultural ways. Such arguments have certainly been made for modern Indigenous ecotourism in Panama (Lanteigne, 2019). More generally, the Conservation Frame can also be separate from the Indigenous Stewardship Frame. In fact, it can be hostile to Indigenous activities. For example, conservation views on hunting being negative can clash with Indigenous views of informative stewardship (Nyyssönen, 2022). Relatedly, the killing of some species, such as apex predators, may be seen as necessary for the Indigenous communities, as they are seen as dangerous, but, on the other hand, conservationists may see this as harming biodiversity (Nyyssönen, 2022). Hunting of key species, as with the Indigenous Makah and whale hunting, has also led to similar conflicts (Kim, 2020). In another example, certain key activities of an Indigenous group's life ways, such as herding, can be seen as detrimental to the ecosystem by other individuals (Nyyssönen, 2022). This is similar to the Bayano region itself, which has seen some conflict between regional conservation, namely the Maje Water Reserve established in 1996, and attempts at protecting Indigenous life ways, as well as advocating for stronger land tenure status (Yahya Haage, 2019b). These examples show that the different Frames can interact in different ways.

As the Frames can refer directly to Indigenous communities, it may be useful to consider the Frames from a Relational Values perspectives. After all, such valuation is common in many Indigenous communities (Bataille, Malinen, Yletyinen, Scott, & Lyver, 2021). Relational Values consist of "preferences, principles, and virtues associated with relationships both interpersonal and as articulated by policies and social norms" (Chan et al., 2016). Both the relationship and the object of the relationship, such as nature or a part of nature, are valued (Deplazes-Zemp & Chapman, 2021). For instance, stewardship denotes a specific relationship with nature, which also has value. In terms of ethnicity, the relationship with nature is also common, particularly as it relates to a component that is part of an identity, such as hunting or ethnobotany. This is similar to how "rarity" can be an aspect that mediates relationships with certain species (Deplazes-Zemp & Chapman, 2021). The Historical Frame, which can include battles for a region or historical heroes that acted as teachers, can also be included. The Economic Frame can also denote a specific relationship with nature, as discussed extensively by some organizations (see Martin, 2009). The fact that these are not just Frames, but also part of relationships with nature is important to keep in mind to understand their use in news media documents. The Omar Torrijos Regime

This paper considered the timeframe of Omar Torrijos' influence. The time was divided in terms of the Bayano dam construction (1969-1976) and post-construction Torrijos period (1977-1981). This paper does not take a strong stance, favorable or unfavorable, towards Omar Torrijos, but some key aspects will offer a useful background. Omar Torrijos was involved in a coup d'état by the Panamanian National Guard in October 1968 and he emerged as the new leader of the nation (Munoz, 1981). Torrijos, who considered the megadevelopment of Panama as a necessity, took a "two-pronged approach" in his leadership (Wali, 1989b). On one hand, he sought "populist reforms in agrarian, social and political structures" (Wali, 1989b). On the other, he also sought to make Panama appealing for international business and funding (Wali, 1989b).

Certainly, large megaprojects were considered primary to the development of the nation (Torrijos, 2000). Achieving energy independence was important for Torrijos (Gordillo & Thomas, 2013). In fact, he felt that access to electricity was necessary for national development

(Alfredo Pérez Rodríguez, 1986). The sovereignty of Panama was also a key goal for Torrijos, for which the development of the Carter-Torrijos Treaty of 1977, regarding the control of the Panama Canal Zone, played a key role (Munoz, 1981; Wali, 1989b).

Omar Torrijos promoted a populist mission dubbed Torrijismo, with "equal distribution and social justice" (Scribner, 2003). Educational and health care reforms were key to his efforts, creating a new school curriculum and constructing hundreds of rural schools and centers providing health care (Wali, 1989b). As has been discussed elsewhere, however, this social movement occurred top down rather than the more common "open, non-hierarchical, collective, grassroots movements" (Scribner, 2003). While populist in some senses, some of Torrijos actions hurt certain members in society, such as the many farmers who had to join "asentamientos campesinos" (farmer settlements), a group category preferred by Torrijos (Munoz, 1981). Furthermore, this populist stance was not without suspicions from some, including fears that it would bring about a Communist regime (see Wali, 1989b).

In terms of international funding, Omar Torrijos was quite successful, even securing funding from the World Bank for the development project that is the focus of this paper, the Bayano dam project (Wali, 1989b). In fact, in their economic overview of the Panamanian nation (1968-1979), a researcher found strongest growth in "the areas of banking, insurance, and financial sectors" (Munoz, 1981). These were areas with low direct control by Panamanian citizens, while those economic areas with more Panamanian citizen control rose less (Munoz, 1981).

Torrijos handed the reins over to Aristides Royo in 1978 ("Panama's Torrijos hands over reins," October 11, 1978). However, he remained very much in control behind the scenes (see "Panama's Torrijos hands over reins," October 11, 1978). After his death in 1981, many of his promises, including to the Indigenous communities, had not materialized and in the subsequent era, did not come about. For instance, he promised the swift redemarcation on the Guna Madungandi reserve and a strong protection against invaders (IACHR, 2012; Wali, 1989b). The redemarcation did not occur until 1996 and invaders remain an issue (IACHR, 2012). Bayano Region

The principal study site is the Bayano watershed, ending in the Darien region in the east (Canal de Panama, 2016). It reaches into the Chepo district in the west (Canal de Panama, 2016). The region consists of humid tropical forests. There have been major losses of forests, due to modern agriculture, cattle raising and lumbering (ANAM (Ministerio del Ambiente), 2015; Urieta Donoso, 1994). The Bayano reservoir, created by the Bayano dam (completed in 1976), is historically the most massive ecological and social shift in the region (see IACHR, 2012). The dam led to many detrimental issues, including a reduction in plant and animal species (Wali, 1989b). Both the ecological changes (Sharma, 2015) and the views of locals regarding the environment, have been studied (IACHR, 2012; Yahya Haage, 2019a; Yahya Haage & Lee, 2022).

The Bayano watershed contains many communities, including the non-Indigenous Campesinos, as well as the Indigenous Embera and Guna (Wali, 1989b). Several of these communities (including some Campesino, Guna and Embera communities) had to be relocated due to the dam (Wali, 1989b). The existence of the Guna Madungandi reserve, effectively established in the 1930s, meant the Bayano Guna had greater control over their governance and political system (ANAM (Ministerio del Ambiente), 2015; IACHR, 2012). While Panama does have recognized Embera reserves, there are none in the Bayano region. As such, during the relocation and compensation periods, the claims of the Bayano Embera came from weaker political positions than the Guna (Wali, 1989b).

The final logistics and subsequent building of the Bayano hydroelectric dam occurred from 1969 to 1976 and the relocation occurred between the years of 1973 and 1975 (IACHR, 2012). Eighty percent (seven of ten villages) of Guna Madungandi was flooded (Wali, 1989a). As mentioned above, the Guna were moved to locations within the Madungandi reserve, partly because the Panamanian government considered their ways of life to be ecological and thus they could protect some of the biodiversity and tropical forest (Wali, 1989b). This is notable as it demonstrates a use of the Stewardship Frame by the government itself. As part of the deal with the Guna, as discussed earlier, the government promised their reserve would be properly redemarcated and the government would keep the region free of invaders (IACHR, 2012). As discussed, eventually, in 1996, the reserve was properly redemarcated (IACHR, 2012). However, the reserve was not adequately defended by the government and there have been land tenure conflicts with some Campesino invaders (IACHR, 2012). The Bayano Embera were primarily relocated to two towns, Ipeti and Piriati (IACHR, 2012). Some Embera left the towns, in part to be closer to their agricultural fields (Wali, 1989b). The towns eventually were designated Collective Lands, Piriati in 2014 and Ipeti in 2015 (Guillemette et al., 2017).

#### **Methods**

This study made use of news media articles from the Bayano dam construction (by Omar Torrijos) period, namely 1969-1976, as well as the post-construction Omar Torrijos period (1977-1981). The following databases were searched for those, as well as later, periods: Pubmed, Ebesco Host, Factiva, Web of Science, ProQuest, ECOLEX, FAOLEX, Gale Newsvault, Google Newspaper, the Hispanic American Periodicals Index (HAPI), JSTOR, Redalyc, Scopus, Wiley Online Library, and the World Bank document database. Some of these databases do not give many media articles or some were outside the time range, but these were used as a starting point to track down some other, more relevant documents. Several databases, such as Redalyc, Google Newspaper, HAPI, Factiva, and ProQuest offer Spanish results. However, most news media articles were in English. As such, the view can be seen as a more international perspective. It should be noted, however, that the Bayano dam project was quite international, including Yugoslavia, Canada, and the World Bank (Wali, 1989b). The Panama Canal Zone is also quite connected to the English speaking world. Even with all this in mind, the results were largely a view looking into Panama. Bayano Indigenous writing would have been a benefit to include, but these did not exist in large volumes for the period. However, many documents discussed the issues of the Bayano Indigenous communities.

The terms searched in the databases were "Bayano AND dam," "Bayano AND presa" and "Bayano AND represa." The media articles were thematically coded for the Frames. Articles that were similar but had different titles and appeared in different locations were counted separately, as they would reach other individuals. As discussed in past thematic and content analysis research, while having a "code book" is useful (in this case the pre-determined Frames), there must be an allowance to have themes emerge while reading the documents (Gale, Heath, Cameron, Rashid, & Redwood, 2013).

#### Analysis

Once the thematic Frames were noted for each document, several key statistical tests were performed on the data. In order to determine when Frames were used together, even if one is criticized, an index of similarity was applied to all pairs of categories (e.g. Stewardship/History, Economics/Conservation). Specifically, this was done with a standard Jaccard index (Leskovec, Rajaraman, & Ullman, 2020; Pielou, 1984), conducted through R Studios. Results for the index can range from zero to one. A zero denotes no similarities and a one equals complete similarity (Pielou, 1984). This was applied for both time periods (1969-1976 and 1977-1981).

The Jaccard index has been used to find similarity in content analysis (e.g. Sasaki & Nishii, 2012; Sdravopoulou, Muñoz González, & Hidalgo-Ariza, 2021; Swartz & Crooks, 2020). It is also commonly used in ecology (Kiernan, 2014; Krebs, 1989). As some have argued, association strength indices, such as the Jaccard index, can work better than other indices when dealing with low numbers of cooccurrences (see Burmaoglu & Saritas, 2019). In their application of the Jaccard index, researchers have pointed to benefits that can generally be stated about its use in many scientific fields (see Fletcher & Islam, 2018). These include its conceptual simplicity and applicability across disciplines (see Fletcher & Islam, 2018).

Importantly for this article, the index can look at binaries and find whether there is similarity in two groups. For the purposes of this study, it can compare how commonly two specific Frames cooccur in the media documents. As in similar research, it compares the cases where they cooccur to the cases where they do not, to develop a resulting index of similarity (see Kiernan, 2014).

Several thresholds have been used to interpret the results of the index, including standard correlation coefficient guidelines (Fried, 2017). Here, a threshold of 0.2 (20%) will be used to suggest interesting similarities. This is similar to other scholars, who suggest such a threshold could be seen as key for data mining (Leskovec et al., 2020).

Some have seen lower results as important as well, and ranges of thresholds can vary based on the type of data collected, such as comparing blogs to questionnaires (Sasaki & Nishii, 2012). As such, the results will also be ranked to better visualize and compare the two time segments (dam construction and post-construction). For instance, in the first time segment, a pair could cooccur the most (top of the rank), but in the second time segment, it appears at a much lower spot in the ranking. This presents a simple way of visualizing changes from one time segment to another. This may be more informational than a simple threshold. Such ranking was similarly done in past work with the Jaccard index, there comparing two general sources of information (Sasaki & Nishii, 2012).(Leskovec, Rajaraman, & Ullman, 2020)

To determine whether there was a greater proportion of a Frame in one time segment when compared to another, the two most common Frames for the first time segment underwent a Fisher's exact test of independence analysis. A benefit of Fisher's exact test is that it can better accommodate a lower number of data points than other similar methods dealing with categorical data, like the chi-square test (McDonald, 2014). Fisher's exact test has been used in past research on environmental change, even comparing two time segments divided by an important event, namely the implementation of new legislation (McCulloch, Tucker, & Baillie, 1992). It has also been used as a tool in thematic analysis (Bell et al., 2014; Bhatia, Athreya, Grenyer, & Macdonald, 2013). Similar to this article, past research has used Fisher's exact test in an environmental-related field and with the use of themes in media articles (see Bhatia et al., 2013).

In this article, for a Frame, say the Economics Frame, it was determined whether there was proportionally more of this Frame in one time segment versus another. The null hypothesis was that no significant difference could be detected between the two time periods. Conversely, the hypothesis was that a significant difference would be detected between which Frames occurred at which time segment (construction and post-construction).

## **Results**

There were 35 documents that fit with the standards for the first time segment, and 23 for the second time segment. The results for the Jaccard indices are shown in Table 1 and Table 2. To better visualize differences, they are also ranked, as can be seen in Table 3 and Table 4. Considering Table 1 and 2, many were quite low in the index, although some, like Ethnicity and History, were relatively high (0.429) for the 1969-1976 period. Stewardship/Ethnicity and Stewardship/History were also high. For the 1977-1981 period, Ethnicity and Conservation (0.286) went past the threshold. Notably, for the 1977-1981 period, Stewardship/Ethnicity, Stewardship/History and Stewardship/Economics had a value of zero. In fact, only one document (4.35%) used the Stewardship Frame in the second time segment (1977-1981). In comparison, 8.57% used the Stewardship Frame in the first time segment (1969-1976). In ranking, Stewardship/History and Ethnicity/History got the top two spots in the ranks for the 1969-1976 period. For the 1977-1981 period, the top spots were taken up by Ethnicity/Conservation and Ethnicity/History.

The two most common Frames were the Economics Frame and the Conservation Frame. Fisher's exact tests of independence were performed to compare whether 1. A significant difference could be detected based on there being more documents with the Frame of Economics in one time segment versus another. 2. A significant difference could be detected based on there being more documents with the Conservation Frame in one time segment versus another. The null hypothesis is that no significant difference could be detected. For the Economics Frame, with 40% during construction and 74% in post-construction, the p-value was 0.237. It was 0.124 for the Conservation Frame (66% for construction, 77% post-construction). As such, the null hypothesis cannot be rejected and no significant difference could be detected based on the proportions of documents using the Economics Frame or using the Conservation Frame. Finally, during the thematic coding, a common theme was the Noah 2 project, which was linked with much of the conservation discussion. The Noah 2 project was discussed, overall, in 48% of papers. This project refers to efforts by the International Society for the Protection of Animals (ISPA) to rescue animals, including sloths and snakes, which were in danger due to rising waters.

## **Discussion**

The fact that significant differences were not detected in discussions of economics or conservation in the different time segments (Fisher's exact test), suggests the topics were still equally discussed. The comparison was for the same Frame in two time segments, so it can offer us this kind of insight. The building of the Panamanian dam, despite its uncertainty in construction, could not be detected to be significantly different in terms of there being more discussion after being built. The fact that the dam was completed did not increase the extent to which the economy and conservation were discussed. This is interesting as some of the impacts of the dam on the economy and the environment would have occurred after the dam was built. This did not change, however, how often the topics were discussed.

It is interesting that, for the second time segment, Stewardship was not used as a Frame in conjunction with the other Frames, except seldomly when conservation was discussed (Table 2). Certainly, Stewardship and Ethnicity were not discussed together. This is in direct contrast to the 1969-1976 period, in which the Stewardship Frame was more likely to appear with several of the other Frames, such as the Historical Frame. In fact, there was only one paper that took a Stewardship Frame in the post-construction period (1977-1981). While this makes interpretation difficult, a few things can be suggested.

Just looking at the ranking, the 1969-1976 list had Stewardship/History and

Ethnicity/History in the top two positions (Table 3). In the next time period, Stewardship and History were not discussed together. However, Ethnicity/History and Ethnicity/Conservation are discussed together. This suggests that, as one example, when history, such as historical figures, were discussed, it was more likely to also involve a discussion of protecting the Indigenous ways of life (Ethnicity) than a discussion of the role of the Indigenous communities as natural stewards of the land. As mentioned, for the second time period, Stewardship did not cooccur with Ethnicity (Table 4). This suggests an emphasis was placed on the loss of life ways of the Indigenous communities rather than the Indigenous communities as stewards of the land. This may be because the view of the Indigenous people being stewards of the land became a weaker argument since several Indigenous communities had been relocated to other regions. As such, they may have been placed in locations, such as the towns of Ipeti and Piriati for many Embera (Wali, 1989b), in which they had less connection to the land and were in less "wilderness" regions. The loss of culture (Ethnicity) may have been seen as something they were still facing in their new locations in 1977-1981. The use of the Ethnicity Frame in the post-construction time period may match this shift. In fact, this focus on social loss rather than stewardship may explain how, even when conservation arguments are made, they are linked to the potential loss of Indigenous ways of life. After all, Ethnicity/Conservation was actually greater in the postconstruction than construction period. Potentially, this shift may also be indicative of an understanding that the Indigenous communities have the "right" to the protection of their culture and this should be the emphasis rather than what role they would play in protecting the environment, which could be seen as a more instrumental view of the Indigenous communities.

As mentioned, Stewardship was also rare in absolute terms for the second time frame. The reduction in discussion of stewardship in the second time segment does fit thematically with more recent examples discussed by other scholars, who argue the "Ethnicity" Frame is more common now when Indigenous topics are discussed (see Haalboom, 2011). Interestingly, the use of an Ethnicity (or Rights) Frame that has been noted in other Indigenous struggles also included an appeal to past, historical struggles (Haalboom, 2011). The fact that the cooccurrence of the Stewardship and the Conservation Frames was also lower in the second time segment may suggest conservation efforts and discussions were not involving the Indigenous communities as much, or at least not presenting their point of view on protecting the area's environment.

The fact that the cooccurrence of Ethnicity and History went down in the second time segment is also interesting. This suggests that others, beyond those arguing for the Indigenous viewpoint, were making use of history to illustrate their point. For instance, one article mentioned Saint Francis of Assisi in discussing animals being rescued (Millman, August 11, 1981).

As mentioned in the methods section, there was a general noting of themes that were common in the documents, even beyond the Frames. One topic that was very prominent in the documents was the Noah 2 project, occurring in 48% of documents overall (e.g. Omang, November 05, 1976). As mentioned, this ISPA project rescued individual animals who were being stranded as the dam waters rose. The animals were caught and placed on dry land. From a Relational Values perspective, the relationship was mediated by individual animal suffering. This rhetorical Frame, namely wild animal suffering, may not have been sufficiently covered by the other Frames and could be included in future research on rhetorical Frames. Certainly, wild animal suffering has been discussed in the field of conservation (Branco, Soriano, Schnaider, & Molento, 2017). Whether it should remain part of the Conservation Frame, as in this study, or considered separately, is a potential source of debate.

A limitation of the study is that the total number of documents available was low, namely 35 for the 1969-1976 period and 23 for the 1977-1981 period. As such, some Frames occurred rarely and sometimes might clump together, influencing the results. Furthermore, the length of news media articles varied. Longer articles are more likely to discuss a topic. However, since they were all news media articles, most were of similar length. Future research could take length into greater account.

In conclusion, several results are interesting and counter-intuitive. The fact the Economics Frame did not increase after the dam was built is interesting considering some impacts would only be seen after construction. Furthermore, that a topic linked to individual animal suffering was so prominent may be indicative of the importance placed towards individual animal suffering by the newspaper and other media consumers, perhaps even more so than threats to entire species.

Table 1 The Jaccard index for each combination of Frames for the first time segment (1969-1976).

	1.	2.	3.	4.	5.
1969-1976	stewardship	ethnicity	history	economics	conservation
1. stewardship					
2. ethnicity	0.25				
3. history	0.6	0.429			
4. economics	0.0345	0.111	0.0667		
5. conservation	0.0698	0.0667	0.0667	0.0462	

Table 2 The Jaccard index for each combination of Frames for the second time segment (1977-1981)

	1.			4.	
1977-1981	stewardship	2. ethnicity	3. history	economics	5. conservation
1. stewardship					
2.ethnicity	0				
3. history	0	0.25			
4. economics	0	0.133	0.0909		
5. conservation	0.0526	0.286	0.2	0.0952	

Table 3 The pairs of Frames ranked from most to least cooccurrence for the first time segment

1969-1976 Rank		
stewardship-history		
ethnicity-history		
stewardship-ethnicity		
ethnicity-economic		
stewardship-conservation		
ethnicity-conservation		
history-economic	Same level	
history-conservation		
economic-conservation		
stewardship-economic		

Table 4 The pairs of Frames ranked from most to least cooccurrence for the second time segment

1977-1981 Rank		
ethnicity-conservation		
ethnicity-history		
history-conservation		
ethnicity-economic		
economic-conservation		
history-economic		
stewardship-conservation		
stewardship-ethnicity		
stewardship-history	Zero	
stewardship-economic		

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# 7.3 Additional discussion of the article

This article is strongly linked to the previous article on Frames, but takes a more narrow scope of the topic. By addressing cooccurrence, it also seeks to find when Indigenous peoples' needs do or do not coincide with "Western" environmentalism. The results of this article aided in developing the Stakeholder Table, as it also looked directly at documents linked to the Bayano dam. For example, a theme that arose was the Noah 2 project, which rescued individual nonhuman animals which had become stranded by rising waters. This helped solidify the importance of nonhuman animals as stakeholders. Importantly, this is part of an effort to try to avoid the criticism of the Good Life being human-centric (see J. Piccolo et al., 2022).

Chapter 8 Relational Values, Human-Wildlife Conflict and terminology

8.1 Introduction and citation for article

This article deals with creating, through workshops, terminology that diminishes the guilt placed on wildlife while maintaining its agency. It has been accepted in the journal *Relations. Beyond Anthropocentrism* without any major changes from this submitted version. The article can be cited as:

Yahya Haage, (2022). Beyond Human-Wildlife Conflicts: Workshops Sought to Develop Terminology to aid in Human/Nonhuman Animal Relationships. [accepted in *Relations. Beyond Anthropocentrism*]

8.2 Article: "Beyond Human-Wildlife Conflicts: Workshops sought to develop terminology to aid in human/nonhuman animal relationships"

### Abstract

Human-Wildlife Conflicts (HWCs) occur when nonhuman animals' needs clash with those of humans. One recent effort regards shifting HWCs into Human-Human Social Conflicts, where conflicts are about humans disagreeing on how to deal with nonhuman animals. This method can help reduce guilt placed on nonhuman animals, but also robs them of their agency. On the other hand, some in the field of biology seek to increase nonhuman animal agency, even making them key stakeholders. A helpful relationship may seek both aspects. Fourteen workshops (147 participants, 40 subgroups), with relevant stakeholders, were run on this topic. Participants were involved in biology and/or environmentalism and/or sustainability. They sought to develop terminology diminishing guilt in Human-Wildlife Conflicts, while maintaining agency. Common themes were then brought out. Eight subgroups argued for more inclusive terms, like "sentient beings" and 18 argued for diminishing human/nature dichotomies. Both fit well with increasing agency, by narrowing human/nonhuman animal gaps. Participants also discussed nonhuman animals as "icons," which 26/30 subgroups saw as, at least potentially, problematic, arguing it conceptually "freezes" species, ignoring their dynamism. In sum, the workshops aid in framing healthier relationships with the natural world.

### **Introduction**

Human-Wildlife Conflicts (HWCs) can occur when the needs of nonhuman animals overlap with the needs or wants of humans (Distefano, 2005). (While the term Human-Wildlife Conflicts and HWCs are used in this paper as they are common in the field, "nonhuman animals" will be used wherever possible. In presenting the workshops, the term "animal," rather than "nonhuman animal" was used to diminish bias). Conflict can manifest with a large range of nonhuman animals, including elephants, monkeys, and big cats, and in a variety of settings, including urban, peri-urban and rural settings (Distefano, 2005). A key way to look at HWCs is a Relational Values perspective, linking nonhuman animals to humans (see Baard, 2019). The relationships go in both directions, as chosen mitigation methods, like culling, have an impact on nonhuman animals, just as they can impact the humans involved in HWCs. As discussed below, the relational component can include more human players, such as stakeholders disagreeing on how to deal with nonhuman animals (M Nils Peterson et al., 2010). This study will first discuss the concept of Human-Human Social Conflicts, highlighting its benefits and potential shortcomings. Then, workshops that were conducted to tackle these issues will be presented.

The need to include more human social factors in considering HWCs has been argued at length (see Dowie, 2009). For instance, HWC increases can occur when one group of humans pushes or restricts another group of individuals (Dowie, 2009). The social components include political, governance and power issues, and have been key to several reserve protection schemes

(Mulder & Coppolillo, 2005; Taljaard & Swemmer, 2011). Even the social realm of religion can mediate and impact HWC issues (Distefano, 2005).

### From Human-Wildlife Conflicts to Human-Human Social Conflicts

This study focuses on one approach to the social factor, chosen as it has the most impact from a Relational Values perspective. There has been a concerted effort to reframe HWCs so as to shift from seeing them as Human-Wildlife Conflicts towards framing them as Human-Human Social Conflicts or HHSC (M Nils Peterson et al., 2010). This is a Relational Values view of Human-Wildlife Conflicts which puts the human-human social relationships front and center. Generally, in this perspective, HWCs are considered as actually being conflicts between different human groups that are in disagreement on how to deal with nonhuman animals, like preservation or culling (see M Nils Peterson et al., 2010). Except in a few examples, most cases do not consider nonhuman animals as being significant agents in the conflict, as this "may perpetuate the anthropomorphic view that animals possess humanlike consciousness, including values, interests, and intents [and] thus representing wild animals as human antagonists" (M Nils Peterson et al., 2010). Some scholars pushing a "social" aspect of HWC do discuss some agency, like when nonhuman animals explicitly target an individual or seek vengeance, but these are seen as rare cases (IUCN SSC HWCTF, 2020; M Nils Peterson et al., 2010). This increase in the human social dimension, however, is not an adequate shift, as it robs most nonhuman animals of any agency, which can lead to unfortunate mitigation efforts. An example can portray this, namely that of a person driving a car and hitting a deer (see IUCN SSC HWCTF, 2020). If the person ran over the deer because they disagree with deer management, it is considered a "true" Human-Wildlife Conflict (namely retitled as a Human-Human Social Conflict) (IUCN SSC

HWCTF, 2020). If this was just an accident, it may not be a "true" conflict (IUCN SSC HWCTF, 2020). Another example is given when regarding a Red-tailed Hawk, which is considered to be involved in an "true" HWC only if "local people exhibit disdain toward the Red-tailed Hawk or intentionally persecute it for its actions" (J. White, Kennedy, & Christie, 2017). Even in cases which don't discuss Human-Human Social Conflicts directly, some tend to fall into the mindset that if there is an encounter with nonhuman animals, and no human is detrimentally affected, there is no impact. In fact, some argue that if no human "has been injured or has suffered a loss," there is no conflict (Conover, 2002). In fairness, some authors admit some in the field of HWCs would use other definitions (see IUCN SSC HWCTF, 2020).

### Going beyond Human-Human Social Conflicts

A beneficial component of transitioning from traditional views of Human-Wildlife Conflicts to Human-Human Social Conflicts is its attempt to diminish the guilt placed on nonhuman animals. However, it may miss important components. The robbing of agency of nonhuman animals is an example of a Relational Values perspective that is not fully adequate. Perhaps a restructuring of language, as advocated through Relational Values, can help reframe this issue (see Simon West et al., 2020). Certainly, a restructuring of language has been argued in attempts to give nonhumans animals more agency, even consider them as stakeholders (Merskin, 2021).

A proper Relational Values perspective of nonhuman animals must take the impact and agency of nonhuman animals into account, while seeking, as in the HHSC view, to limit the "guilt" placed on nonhuman animals in conflicts. As has been argued, once the agency of nonhumans is considered, they could be seen as stakeholders (see Tallberg, García-Rosell, & Haanpää, 2022). The need to see nonhuman animals as stakeholders in the events in which they interact with humans is not new (Kenehan, 2019; Sage, Dainty, Tryggestad, Justesen, & Mouritsen, 2014; Tallberg et al., 2022). Once this shift is done, a proper Relational Values perspective could be developed, one that reduces the guilt placed on nonhuman animals, while still maintaining its agency.

The Relational Values perspective also argues for efforts in "restructuring language" to better understand relationships, which is key to this study (Simon West et al., 2020). Such views of the need to change language is also present in the larger HWC field, as discussed at length elsewhere (IUCN SSC HWCTF, 2020). Modifying the term "Human-Wildlife Conflict" to "Human-Wildlife Coexistence" or "Conservation Conflicts" are two such examples (IUCN SSC HWCTF, 2020). Other language shifts are possible, as discussed below.

#### **Methods**

The aspects of Human-Wildlife Conflict articulated above, from nonhuman animals as stakeholders to reducing the guilt placed on nonhuman animals, were key in workshops run in 2020 and 2021. These 14 workshops were conducted with 147 participants (divided into 40 subgroups) involved with biology and/or environmentalism and/or sustainability. All participants were adults. Participants were collected through listservs, both university- and discipline-based. In a Snowball Sampling method, potential participants were encouraged to suggest other individuals or organizations who might be interested. The participants' anonymity was considered important and they were not considered to be representatives of any specific organization. In general terms, the groups they were connected to included executives of environmentalist organizations, experts at wildlife rehabilitation centers, executive members of Sustainable Development Goals think tanks and advocacy groups, and experts in ecological restoration societies. For the category of "experts," say for wildlife rehabilitation, it considered

those with an academic background that was relevant to their work as well as those with relevant official positions in that area of work. The ethics approval was obtained from McGill University (#20-02-027). All participants signed an approved consent form. This consent form text informed them that there would be both primary, and, potentially, secondary uses of the workshop information. Each participant received 50 Canadian dollars and notetakers received an additional 50 Canadian dollars. There were several activities in the workshops, but only some were of relevance to this current paper. The workshops were not recorded, with notetakers writing key information down. Notetakers were told to avoid names. The data from the workshops was anonymized for the original use and for this specific study.

Participants were divided into subgroups (40 subgroups in total) and tasked with developing terms and themes which would shift the conversation by diminishing the "guilt" which may be attached to nonhuman animals in HWC cases. They were also advised to keep the "agency" of the nonhuman animals in mind. The former is linked to the main goal of the Human-Human Social Conflict shift, namely its attempts to reduce the guilt placed on nonhuman animals in conflicts. The latter is linked to what is missing in Human-Human Social Conflicts, namely seeing nonhuman animals as potential agents, and even stakeholders.

A few starting examples were given by the author. For key terminology, the example of using the term "accident" rather than "attack," and "damage" rather than "conflict" were suggested. For key phrases, the idea of a nonhuman animal "having a right to be" in a location, that it is "just an animal," that a nonhuman animal is "responding to impact," and, finally, the idea of a nonhuman animal as "an icon or symbol," were all suggested. The idea of these terms and phrases was to get conversations started, in case the groups needed prompting. The concept of Relational Values was not presented to the workshop members, although the differences between anthropocentrism, biocentrism, and ecocentrism were briefly defined. The participants were polled as to whether they see themselves as anthropocentrists, biocentrists, or ecocentrists.

Notetakers were tasked with writing down the terminology, key phrases and general discussion topics in their subgroup. Following this, the author went through the resulting documents, noting, through content analysis, recurring themes (see Vaismoradi et al., 2013). A previous reading of topics in HWCs as well as Relational Values helped situate the discussions, but the themes recovered were also allowed to come from the notes themselves, as suggested for thematic analysis and Grounded Theory (see Gale et al., 2013). As the participants sought to develop clear, consensus, terms and themes, the content analysis process, in terms of common themes and terminology, was straightforward.

# **Results**

The poll results showed that most (94 participants) saw themselves as ecocentrists, some (38) saw themselves as biocentrists, and others (15) as anthropocentrists. The discussions were lively and two common themes that arose were the need to change the term "animal" to more general and inclusive terms like "living beings," "nonhuman animals" and "sentient beings." This theme came up in eight subgroups. Another, related, common theme was the need to diminish the human/nonhuman animal dichotomy. This discussion appeared in 18 subgroups. In terms of the notion that "an animal has the right to be" in a location, 30 subgroups discussed this, agreeing that it was valid, with one adding the caveat that species migration must be taken into account as well.

The prompting concept that led to the most in-depth discussion was the idea of making a species a "symbol" or "icon" for a region. Interestingly, the discussion was quite varied in terms of support for this idea. The main concept is that if a species can be made a symbol of a region,

there may be more will to protect it and the mitigation methods when dealing with HWCs may be less severe (see Hill, 2002). The opposite view, that having a species as a symbol could lead to more hunting, has also been discussed in the literature (Kelly, 2015). Of the 30 subgroups (out of 40) which discussed the topic, 15 saw the process of making an animal a "symbol" as problematic. Eleven subgroups saw it as a potential benefit, but with clear potential downsides as well. Four subgroups saw it as a positive endeavor.

# **Discussion**

The results demonstrate that participants in these fields are open to large changes in how humans approach the natural world, including rethinking our role vis-à-vis nature. The workshops also garnered several examples/agreements of terms which could help reduce the "guilt" that may be placed on the animal.

Interestingly, without being directly guided, participants argued for changes that are discussed in the literature on Relational Values, including diminishing the human/nature dichotomy (see Riechers et al., 2021). In terms of restructuring language to create healthier relationships, as advocated by Relational Values (Simon West et al., 2020), the workshop participants hit on finding terminology that further connected humans to nonhuman animals.

Giving nonhuman animals more agency, even putting them on the same level as humans, can also arise from the restructuring of language tackled in the workshops. For instance, by transitioning to more inclusive terms for nonhuman animals, like "living beings" or "sentient beings," one can reframe the car/deer collision example discussed above. The view of the deer, being a "sentient being" (just like the human motorist) must be taken into account. One way to consider this is that even if the motorist doesn't care about the car accident, the deer, as a "sentient being," probably did not want to be struck by a car. This can develop a more expansive concept for HWCs, which can thus combine the social concept of Human-Human Social Conflicts, such as how people interact with differing methods of dealing with Human-Wildlife Conflicts, with the benefits of regarding nonhuman animals as potential agents and stakeholders. As has been argued, once the interests of nonhuman animals is sought, unnecessarily ending the life of a nonhuman animal is a form of suffering (Davidson, 2013; T. Regan, 1985). Specifically, "an untimely death is not in the interests of its victims, whether human or animal" (T. Regan, 1985). As such, it must be determined when, if ever, this is worth it. As with other "restructuring" of language, this can help create a more complete Relational Values perspective.

While it may seem like a trivial change in language, it can be a first step towards seeing nonhuman animals as stakeholders in themselves. Terminological changes discussed in the workshops certainly target the importance of such changes. Several attempts in the scholarship have been made to achieve this, and they often involve a restructuring of language (Frawley & Dyson, 2014; Carrie P. Freeman & Merskin, 2016). In certain cases it is the application of legally recognized terminology, such as granting some nonhuman animals agency and "personhood" (Boyd, 2017). One can also find several philosophical attempts to raise animals towards being stakeholders, ranging from the application of the Veil of Ignorance to include animals, to discussing that pseudo-contracts already exist with some animals (see Matevia, 2016). Reframing is an important aspect in creating healthy relationships with nature, and this is certainly the case of considering nonhuman animals as stakeholders. The recent inclusion of children as stakeholders, such as in Child-Friendly Schools (Kagawa & Selby, 2014) can act as an analogous effort. The workshop results certainly fit with these efforts.

In terms of turning a species into an icon, the majority of subgroups that discussed it pointed to at least some potential negative components. This "icon building" certainly creates a new relationship between people and nonhuman animals. Some saw this as too anthropocentric or a way of metaphorically "freezing" a species and not seeing it as a living entity. Analogous arguments have been discussed regarding Indigenous groups (Rice, 2014). In terms of nonhuman animals, "icon building" may rob the nonhuman animal of some agency and value. Some pointed to cases where it has been attempted but which the workshop participants saw as having failed to work, such as turkeys and kangaroos. Despite being "symbols," these animals are still routinely killed, which several workshop participants saw as unfortunate. Some subgroups pointed to the "presidential pardoning" of a turkey in Thanksgiving to be an example of "icons" not being protected. Some scholars have also critically discussed this "twisted Thanksgiving publicity stunt" (M. A. Brown, 2015). In the case of kangaroos, scholars have argued that reducing the population size of this "iconic native animal" is necessary (Read et al., 2021). Turning a species into an icon in order to encourage protection of threatened species is something discussed in the Human-Wildlife Conflict literature (Hill, 2002; Messmer, 2000). However, a study on "iconic" species suggests that it may not be sufficient to protect a species (Montgomery et al., 2020). In fact, it can work against conservation, as discussed by scholars regarding jaguars in Mesoamerica (Kelly, 2015). This action of turning species into icons may mostly work with charismatic species, as discussed in the literature (see Macdonald et al., 2015). Some have argued, however, that protecting a Flagship species usually means protecting its ecosystem and protecting other, less charismatic species (Kellert, 1986). In the end, workshop participants certainly honed in on the fact that there can be benefits and potential detrimental components to the effort.

# **Conclusion**

In sum, this piece began with efforts, in the literature, of removing the "guilt" placed on nonhuman animals in HWCs. While this was one of the goals of the workshops, participants went much further. The workshops helped bring out other themes that could be beneficial to the views of HWCs, particularly from a Relational Values perspective. Changing the terms used, a key aspect of Relational Values, was discussed by the workshop participants. They moved beyond simply placing less blame on wildlife in HWCs. This included the necessities of reframing perspectives of species in their interactions with humans. The workshops suggest the importance, to participants, of giving species a level of agency and even stakeholder rights. As mentioned, using this frame, event like deer/human collisions can be reinterpreted, so as to create a more Relational Values perspective, which considers animal agency.

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- 8.3 Additional discussion of the article

This article is the first (of two) based on 14 workshops with stakeholders involved in biology and/or environmentalism and/or sustainability. The workshops were inspired by the surveying and workshop with the Maje Embera Indigenous community. As further work with the Indigenous communities proved difficult, it was decided that stakeholders in the relevant fields would make good participants. Participant anonymity was seen as important and participants were not meant to represent the organizations to which they belong. To get some idea of participants, Table 8.1 in a non-exhaustive list of the types of participants involved.

The work on terminology is of importance to Relational Values, as it discusses relationships between humans and nonhuman animals, as well as other components of nature. Furthermore, the results of the workshops and terminology helped guide the development of the Stakeholder Table, by bringing forth new stakeholders, like species, ecosystems, and individual nonhuman animals. It is also a strong step in creating a Good Life that is not human-centric, a key criticism (see J. Piccolo et al., 2022).

An activity that did not make it into the article but is also of note dealt with Ecosystem Services in a hypothetical water development project. The results of this activity helped in determining potential stakeholders for the Stakeholder Table. It also links directly to Relational Values, both generally, in dealing with relationships, and explicitly such as considering how common Cultural Ecosystem Services are compared to other categories of Ecosystem Services. This part of the workshops is explored in this thesis' general discussion section and the results are in Appendix 1.

The next article came out of the same 14 workshops and is the continuation of the process of Relational Values, namely from relationships to Frames to the Parameters of the Impact equation. The Parameters do not include all possible Frames, but are key in terms of environmental impact. 

 Table 8.1 General categories of workshop participants ("ambassadors" educate outsiders about their group)

Executives/ambassadors at development projects that explicitly incorporate relevant Sustainable Development Goals (SDG)

Executives/ambassadors at Animal Welfare/Rights organizations

Wildlife/conservation experts at wildlife rehabilitation centers

Wildlife/conservation experts working at national parks

Wildlife/conservation experts at ecological restoration societies

Executives/ambassadors in Effective Altruism organizations

Executives/ambassadors in university-based biology organizations

Executives/ambassadors in university-based environmental organizations

Executives/ambassadors or experts in tree-planting or permaculture environmentalist organizations

Executives/ambassadors at divest and climate change mitigation organizations

Executives/ambassadors of other environmentalist organizations

Executives/ambassadors of SDG think tanks and related advocacy groups

Scholars involved in studying/researching in relevant fields (e.g. wildlife conservation)

Chapter 9 Relational Values, Human-Wildlife Conflict and the Impact equation

9.1 Introduction and citation for article

This article builds on the Frames view of Relational Values, connecting them to larger social aspects, as discussed in the Impact equation. It can be cited as: Yahya Haage, (2022). Human-Wildlife Conflicts and the Environmental Impact Equation: Creating a Version through Stakeholder Workshops and Relational Thinking. [to be submitted to *Science of the Total Environment*]

9.2 Article: "Human-Wildlife Conflicts and the environmental Impact equation: Creating a version through stakeholder workshops and relational thinking"

### <u>Abstract</u>

The Impact equation, (I=PATE), considers environmental impact as a function of population, affluence, technology and ethics. While widely used, no specific Human-Wildlife Conflict (HWC) version exists. As HWCs will only increase, this is a key gap. Here, a general HWC Impact equation is first laid out. To refine this framework, 14 workshops with stakeholders (147 individuals, 40 subgroups) involved in biology and/or environmentalism and/or sustainability were conducted. Participants were tasked with seeking new components/subcomponents for the equation. They also discussed how to reduce the most impact, either by considering one leverage point or by developing a path to lower HWC impact. Finally, participants discussed which stakeholders (Local/National/International) are most impactful. The results were interesting, with Education being the most common new component/subcomponent. Regarding leverage points and paths, Ethics was most commonly chosen as key. International organizations were most commonly considered vital. In sum, a useful HWC Impact equation was developed.

### **Introduction**

The Impact equation, namely that environmental Impact (I) is a function of Population (P), Affluence (A), Technology (T), and Ethics (E), can lead to interesting applications (see P. G. Brown & Garver, 2009). In this study, a Human-Wildlife Conflict Impact equation is developed. This was done through workshops with relevant stakeholders.

The origins of the Impact equation are attributed to Ehrlich and Holdren (1971), originally considering per capita impact and population. The most widely used format is I=PAT and it can work as a "starting point for investigating interactions of population, economic growth, and technological development" (Chertow, 2000). One of the equation's benefits is that "it is a parsimonious specification of key driving forces behind environmental change" (York et al., 2003). Each Parameter is related to the others. The Impact equation is thus a great example of Relational Values in environmental impacts. For instance, a massive reduction in population can be compensated with an increase in affluence. Relatedly, as affluence can be considered the "consumption per capita," and there is much variation in individual consumption from community to community, many relationships between communities can be elucidated (Ehrlich, 2003). Looking at the Technology Parameter, more efficient environmental impact-reducing technology might leave room for the other Parameters to increase. As such, society can explore topics like how much "efficiency [must] improve to assume rates of change in population and affluence" (York et al., 2003).

One key point which should be understood is that while the Parameters' relationships can be considered multiplicative, there are other possible types of interactions (York et al., 2003). As such, the Impact equation can be seen as Impact (I) being a function of P, A, T, and E, with many possible relationships between Parameters. The Impact (I) Parameter can take many forms, including being defined as carbon emissions, energy consumption, "biodiversity loss, resource depletion [and the] pollution of air, water and soil" (Nørgård & Xue, 2016). The first three Parameters, namely Population, Affluence and Technology can also be quantified. For instance, environmental impact can be "a function of human population size (P), per-capita production and consumption of goods and services [, namely affluence (A)] and technological (in-)efficiency (T)" (Mikkelson, 2013).

A brief discussion of Technology can illustrate the potential complexity of the Parameters. In terms of technological efficiency, it can help reduce the ecological footprint, say through more energy efficient buildings (Marcotullio et al., 2018). However, for many energy efficient goods, which would fit with T, complex components such as the planned obsolescence of goods must also be considered in any long term change (Mikkelson, 2013). Others have pointed to the Rebound Effect, in which technological efficiency, such as fuel efficiency, can rebound and results in more ecological impact (Nørgård & Xue, 2016). As such, the T factor can be focused "towards prolonging the durability of products" (Nørgård & Xue, 2016). For some, as discussed by T. G. Taylor and Tainter (2016), geoengineering and carbon capture are potential avenues for helpful technology. However, this may be an unwarranted techno-optimism (T. G. Taylor & Tainter, 2016). Perhaps a wider perspective on "technology" could be taken, so as to include efforts at reforestation, which can act as carbon storage technologies and can include Indigenous knowledge regarding agroforestry. As has been discussed, the Parameter T has been widely construed, even including "forms of knowledge" (Stern, Sovacool, & Dietz, 2016).

Ethics is a newer Parameter in the equation, elaborated early on by P. G. Brown and Garver (2009). They offer several examples of ethical beliefs leading to key changes and actions, like getting rid of industrial animal agriculture on the basis of a reverence for life (P. G. Brown

& Garver, 2009). This example actually fits well in a Relational Values perspectives, as it would greatly impact the other Parameters of the Impact equation. This last Parameter, Ethics, is harder to quantify while keeping it connected to the other Parameters. In their discussion of the Parameter, P. G. Brown and Garver (2009) point to the issue of intrusive advertising and the methods of animal husbandry, but how best to include such measures along with the other Parameters is not clear. As such, the full PATE format can be used for general conceptual exercises. This aspect, and potential analogues in other fields, will be explored further in the Discussion section.

Some expansions to the Impact Equation have been developed, including a method that separates Technology into "consumption per unit of GDP" and "impact per unit of Consumption" (York et al., 2003). For the sake of simplicity, this study kept it as is (I=PATE), because consumption is tightly related to the Affluence Parameter. As Ehrlich (2003) discusses, a small group of affluent individuals generally, through consumption, have the greatest environmental impact. The simplicity of the equation also probably made the workshop activities described below easier to accomplish. However, it is good to keep in mind that there is a strong relationship between affluence and level of consumption.

Other variations that take into account the relationships of the Parameters include combining them by theme. For example, the Parameters of Affluence and Technology have been combined, due to their connections, into the component of Carrying Capacity (see Bystroff, 2021). Also, the connection between population size and affluence is sometimes used when arguing for international development (see Shaw, 1992). As explored by scholars, the development in the economy of a nation could lead to individuals seeking fewer children, meaning there is less fertility in the nation, and thus, population would decrease (see Shaw, 1992). However, these connections have been hotly debated (see Shaw, 1992). Predictive Impact equation models have also been created (see York et al., 2003) but for this research and the workshops, general relationships between the Parameters was the focus.

An HWC Impact equation

While several forms of the Impact equation have arisen, a version focused principally on Human-Wildlife Conflicts (HWCs) has yet to be put forth. In simple terms, an HWC occurs when "wildlife's requirements overlap with those of human populations, creating costs to residents and wildlife" (Distefano, 2005). This is a notable omission, particularly as HWCs will only become more prevalent with time (see Rands et al., 2010). The basic framework can be outlined in this section.

An HWC Impact equation deals with relationships even more so than the basic equation, as it targets both human and nonhuman living beings directly. As discussed in the field, the usual Impact equation can have the "I" Parameter refer to general impacts like carbon footprints or the more specific environmental aspects of an industry (Capitano, Peri, Rizzo, & Ferrante, 2017). In the HWC Impact equation, the goal is to reduce the impact of Human-Wildlife Conflicts. This could be framed as monetary costs, lost crops, injuries (both to humans and wildlife) or other related components considered in HWCs (see Distefano, 2005). The HWC Impact equation must therefore be quite flexible. Its use depends on the situation in which it is applied. Furthermore, an HWC Impact equation has two qualities that would make it very relational: 1. It has a two-way relationship and 2. It is a multiscale formulation.

In terms of being a two-way relationship, this is clear for the Technology Parameter. For instance, the mitigation technology used when dealing with an HWC must take into account the relationship between the user and the technology, including availability and affordability, as well

as the relationship between the mitigation technology and the wildlife. As an example for the latter, mitigation methods can range from retaliatory killings to cultivating wildlife irritants (Distefano, 2005). The former may be very effective, but devastating towards the wildlife. The latter may be less effective but harms the wildlife less. As such, individuals using an HWC Impact equation must choose a technology that can be placed in a spot on a spectrum.

The HWC Impact equation must also be a multiscale formulation. The Parameters can be considered from a local, regional or international frame of reference. For instance, consider the Population Parameter. This can range from the size of the local population interacting with the wildlife, to the general global human population, which can add pressure on an already stressed human/wildlife interaction. Similarly for Affluence, in which the wealthy regional or international individuals' desire for animal parts can fuel Human-Wildlife Conflicts (M. Harrison et al., 2016). At a smaller scale, scholars have discussed transitioning affected individuals to other, perhaps more fruitful, careers, like ecotourism, in the hopes of alleviating conflicts (Walpole & Thouless, 2005).

The Ethics component is also clear in several HWC-based circumstances and is connected to them through meaningful relationships. As discussed above, the thirst for rare animal parts fits well in the Affluence component. However, many conservationists have taken an ethical stance against this industry, often going to the lengths of burning tusks from deceased elephants to avoid them entering the black market (see Aryal, Morley, & McLean, 2018; see Walker, 2013). This is clearly a moral stance, informed by ethics, that demonstrates the relationships between conservationists and a subset of affluent individuals.

While a basic framework for the HWC Impact equation has been discussed so far, it is important to receive feedback and further refine the equation. As such, a group of individuals

involved in biology and/or environmentalism and/or sustainability were recruited to refine and tackle this new, HWC-based Impact equation.

This study sought, through group discussion sessions to:

- Help refine the novel HWC Impact equation by the addition of vital components (or subcomponents).
- 2. Seek to find leverage points to consider in the equation, to lower impact as much as possible. A relational and synergistic perspective was encouraged for this stage.
- 3. Determine which organizations and stakeholders can have the most influence in lowering impact. These can be at the local, national or international level.

### **Methods**

A series of 14 workshops were run with 147 participants (all adults) involved in the realms of biology and/or environmentalism and/or sustainability. Generally, participants included executives of organizations focused on environmentalism, experts at wildlife rehabilitation centers, executive members of Sustainable Development Goals advocacy groups/think tanks, and those with expertise in ecological restoration. For the category of "experts," it generally meant those with a relevant academic background as well as those with official positions in their fields. Workshops took place, remotely, in 2020 and 2021. Participants were mainly recruited through listservs, although a Snowball Sampling method was used in which individuals could recommend or lead to other potential candidates. Due to the sampling method, some groups were predominantly from one field or another, but the categories generally overlapped. The workshops dealt with several activities, but only a few are relevant here. Research ethics was approved by the McGill University REB ethics board (# 20-02-027). Participants signed an approved consent form, in which they were informed that there would be

both a primary, and, potentially, a secondary use of the data. Anonymity was seen as important and the views of a participant were not meant to be the views of organizations they may be linked with. The workshops were not recorded. Rather, notetakers, who were told not to include any names, were used. All information was anonymized for this study. Participants each received 50 dollars (Canadian) for the workshop, with an additional 50 dollars (Canadian) for each notetaker. The workshop took around an hour.

The participants were educated regarding the issues of Human-Wildlife Conflicts around the world. They were introduced to the Impact equation, and how it could be modified to fit with HWCs. Several examples were discussed, each targeting a Parameter, as well as interrelations. Examples were also given for the scales of each of the Parameters, namely at the local, national and global levels.

Participants were separated in subgroups, 40 in total. They were tasked with refining the HWC Impact equation by suggesting missing components or subcomponents. They were also tasked with discussing and developing a way to achieve the greatest reduction in HWC impact. They could choose a single Parameter they felt was a good leverage point. In the literature, similar exercises have been postulated related to the Impact equation, namely dealing with the "important question [regarding] which factors can be most easily and effectively changed" (York et al., 2003). As relationships are key to the equation, workshop participants could also develop a path to lower impact. For instance, they could argue that the easiest Parameter to shift is Population, which would make Affluence easier to modify, which would lead to the greatest reduction in Impact. To also get an overall view, the results for the full set (40 subgroups) were also considered.

In terms of statistical tests, Fisher's exact goodness of fit (J. H. McDonald, 2014) was performed, with the null hypothesis that participants were just as likely to pick any of the categories (Ethics, Affluence, Technology, Population). Post-hoc statistics were performed where applicable (R Studios, XNomial and binom.test). Bonferroni correction was applied (p=0.0125). It is possible that the null hypothesis, namely equal choice between categories, is not the most likely null scenario, but no other one has been developed in the literature for the variables considered in this paper.

Participants were also asked to suggest which stakeholder groups could have the greatest influence in the reduction of impact. This was used to see whether participants were considering a local, national or global perspective in terms of diminishing impact. The organizations were subsequently divided into local, national, and international entities, as well as an "other" category.

### **Results**

Several leverage points and paths were developed, although some subgroups did not extensively discuss their choices. In total, 24 used the path method and 16 relied on a single Parameter for change. The most common point of leverage to reduce the impacts of HWCs was the Ethics Parameter. Ethics was chosen in eight out of 16 subgroups. This was followed by Technology (five subgroups), Affluence (three subgroups), and Population (zero subgroups).

The statistical results show that, for a single Parameter, Ethics had a p-value of 0.037, so not greater in occurrence than chance when the Bonferroni correction was considered. The Population Parameter was quite low but not significantly less than chance (p=0.017). Technology had a p-value of 0.57 and Affluence had a p-value of 0.77. As such, the Ethics and Population Parameters were close to the Bonferroni corrected p-value.

In terms of paths, the most common first step was also Ethics. It was the first step in 16 out of 24 subgroups. This was followed by Technology (six subgroups), Affluence (one subgroup), and Population (one subgroup). When one considers the first Parameter in a path, Ethics was significantly greater in occurrence than chance ( $p=2.022 \times 10^{-5}$ ). Affluence had a p-value of 0.016 and Technology had a p-value of 1. Population had a p-value of 0.016. As such, both Population and Affluence were close to the Bonferroni corrected p-value.

A merging of the two types of subgroups, namely those who used a single Parameter as amenable to change and those that created a path to lower impact, was also done. While some precision may be lost by combining the categories of the subgroups, it does increase the sample size to 40. Furthermore, there are theoretical reasons to combine the two groups. After all, for those who chose a path, the primary step still refers to the Parameter they feel is most amenable to change. This is, of course, the same goal for those focusing purely on a single Parameter. Combining the results of the 40 subgroups, there are 24 for Ethics, 11 for Technology, four for Affluence and one for Population. The same Fisher's exact goodness of fit can be performed with these 40 datapoints. Results are: Ethics (p=1.19e-06), Technology (p=0.72), Affluence (p=0.028), and Population (0.00032). As such, and considering the Bonferroni correction, the results are similar to the case where the 40 subgroups are separated. Ethics occurred more than based on chance and Population occur significantly less than chance.

The additional Parameter that was argued for the most was Education, sometimes seen as a necessary subgroup of another element. The necessity of including education was argued in 18 out of 40 subgroups. In nine cases, it was chosen as a new Parameter. In the others, it was seen as a potential subcomponent of another Parameter. In terms of which organizations can have the greatest influence in lowering impact, the results were quite varied. Each subgroup was not limited to a single organization, in order to offer more flexibility. In total, 66 organizations were put forward, including local, national, international, and other. The last category was for those that were very expansive or could include several levels of complexity. Ten organizations fit this category. For instance, three argued for the influence of religion and another for the importance of tradition.

For national organizations (18 appearances), the federal government was the most common, occurring 18 out of 18 times. This makes sense as, when one thinks of national stakeholders, the federal government is key. Local groups included those in charge of ecotourism as well as local Indigenous groups. There were 16 local level groups discussed. Finally, the largest group was for global organizations (22 appearances), with the most common ones being international NGOs, multinational corporations, and funders like the World Bank.

### **Discussion**

It is interesting that the Parameter of Ethics was seen as such an important leverage point or starting point for a path to lowest impact, particularly as this is a recent addition to the Impact equation. Notably, the importance of worldviews, both religious and nonreligious, in HWCs has been emphasized in several works (Madden & McQuinn, 2014; M. Nils Peterson, 2014). For instance, some have discussed the importance of getting involved with the worldviews of local communities to better manage HWCs (Madden & McQuinn, 2014). More generally, when discussing the Ethics Parameter, P. G. Brown and Garver (2009) emphasize that the proper inclusion of science, religious views and ethics is needed to create the right relationship with nature. The combination of Human-Wildlife Conflicts and the Impact equation certainly combines the largely scientific field of HWC with social aspects, and, with the Ethics Parameter, different worldviews. As such, it is perhaps not surprising that workshop participants, who were variably involved in biology, environmentalism, and sustainability, also saw the importance of the Ethics Parameter. After all, these fields, particularly environmentalism and sustainability, often have a social component. Relatedly, others have stressed that wildlife management itself necessarily consists of a scientific endeavor undergirded by different philosophies (Conover, 2002). Certainly, many participants fit with the "Moralistic Attitude" to wildlife and are "concerned about human morality and ethics" (Conover, 2002).

For the scope of who could achieve the most change in reducing HWC impact, the choice was predominantly international organizations. Participants, being involved in biology, environmentalism, and sustainability, may have been considering the international trade in animal parts. The fact that some stakeholders did not fit the general categorization (Local, National, International) was particularly interesting. For instance, three groups pointed to religion as being able to have a strong impact. These participants may have been considering worldview changes in the long term. After all, as discussed by Benthall (2003), religions could impact environmental change in a longer timeline than other stakeholders.

It is interesting that Population was chosen less than predicted by the null hypothesis. This certainly fits with the discussion by several scholars about the unpopularity of population control in contemporary rhetoric (Robertson, 2012). As the most common type of stakeholder chosen was international in scope, approaches in controlling population size, or at the very least discouraging population growth, could be seen as too sweeping an approach for global organizations.

Education as the missing component is interesting, as education has been discussed as an important aspect in reducing HWCs (Madden, 2004). With the workshops' results in mind, a few

key aspects can be considered. One such aspect is how, in education regarding HWCs, the type of relationships considered is vital. This can occur in terms of the relationships between individuals and aspects of a specific species. For instance, inaccurately seeing a species as a man-eater or a common killer of humans can affect coexistence (Rummy & Rummy, 2021; Samarasinghe, 2014). The relationships of individuals and specific natural features also has an important educational component. For instance, education related to where and when to avoid wildlife interaction can be key (see Gross et al., 2021; see Hamilton, 2014; see Spencer, 2018). Relationships between a community and nature, in terms of education, might be of use. For instance, regarding educational curriculums, some have as a goal to create a good human/nature relationship (Iltus, 2013). Such education can be a helpful step in creating a reliable coexistence with wildlife, starting with a positive human/nature position. This type of education in environmentalism was actually discussed by one subgroup.

As an example of existing efforts, the field of Conservation Conflict Transformation (CCT) seeks to ameliorate conservation conflicts by educating stakeholders on a situation's underlying issues (Madden & McQuinn, 2014). Education can actually not only range in terms of stakeholders, but even in the disciplines involved, such as Conservation Psychology and Sociology (Bennett et al., 2017). It can range from ensuring accurate information about species impact, such as the actual extent of crop raiding (Distefano, 2005; Kansky & Knight, 2014), to educating and gathering, from stakeholders, information regarding governance options, to create better HWC management (see B. Gray, 2003).

As with relationships between Parameters, a link between the Education Parameter and the Ethics Parameter can be made. In fact, some saw Education as a sub-component of the Ethics Parameter. A few examples can illustrate these potential relationships. For instance, when
seeking to influence animal culling, an understanding of hunting culture and worldview is useful (see M. Nils Peterson, 2014). Another example is understanding the relationships of Indigenous groups to wildlife and nature. This can include both positive and negative aspects, such as has been discussed regarding hunting being linked to the search for an ethos of pre-Columbian status (see Kelly, 2015). In both cases, an education regarding these cultural groups is a first step to an open, and ethical, dialogue. In terms of CCT mentioned above, the underlying issues in conservation would certainly fit with the Ethics Parameter (see Madden & McQuinn, 2014). One workshop subgroup also argued for a direct relationship between education and ethics, with the former seen as necessary to achieve changes in ethics. In general, given the focus on Education as a beneficial Parameter in the workshops, and its key role in HWCs, a potential new HWC Impact equation might be I=PATEEdu.

While education is definitely tied to HWCs, it is hard to quantify it in the terms of the equation, just as with Ethics. However, analogous frameworks, including in the area of Water Scarcity, have managed to incorporate education (C. A. Sullivan, Meigh, & Giacomello, 2003). One can look at something like the Water Poverty Index (WPI) as an inspiration for how the I=PATEEdu equation could be applied. In the Water Poverty Index framework, each component in water security (Resource, Environment, Access, Capacity and Use) is calculated and then regions are often compared (e.g. C. Sullivan, 2002). As such, while a total Water Poverty Index can be developed, much can also be learned by comparing each component in each region. Thus, Education could be measured and compared to the Education of another site or a global measure. The idea of comparing national Impact equations is not new (see Mikkelson, 2013). As discussed elsewhere, education measures in such indices could include the proxy of school attendance (see Yahya Haage, 2019a). In terms of the IPATEEdu equation, the Education Parameter could be

measured by level of education about the environment or the proportion who are educated on how to deal with HWCs or on HWC misinformation. For the Ethics component, the level of Connectedness to Nature could be a useful measure (see Mayer & Frantz, 2004). These could then be compared to other regions to see where work needs to be done.

In conclusion, a novel HWC Impact equation was outlined and this was refined by several workshops. With the relational perspective front and center, the Ethics Parameter was considered the most likely leverage point, including as a first step in developing a path to lower HWC impact. Several participants also sought to include the concept of Education, both as a new Parameter and as a subcomponent. Finally, when asked who could help the most in reducing HWCs, with the Impact equation in mind, local, national and international organizations were all presented as key stakeholders, with the international category being the most common. While more refining might be necessary, this study developed an Impact equation useful for the ever-increasing Human-Wildlife Conflicts.

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- 9.3 Additional discussion of the article

This article indicates the next step in the exploration of Relational Values. After a discussion of Frames as being formed from different relationships, this article considers the higher level, specifically looking at the Parameters of the Impact equation. Of course, other categories could also be useful in other cases, but the Impact equation is the focus here.

The creation of a Human-Wildlife Conflict Impact equation is important in itself, but it also helped in bringing forth other stakeholders worth considering in the Stakeholder Table. This is particularly true for the activity regarding which stakeholders could make the most impact in terms of lowering Human-Wildlife Conflicts.

The result that Education could make a key new Parameter is interesting. In fact, as mentioned in the article, education plays a key role in Human-Wildlife Conflicts already. The thesis' general discussion section includes some potential examples, by considering the Impact equation alongside other Human-Wildlife Conflict frameworks.

Since an HWC Impact equation was conceptually developed, it could, with the proper data, be applied to the Bayano region. Snakes, wild dogs, crocodiles, and even cattle could be used as the wildlife. For the latter, it would be tied to cultural views, as Indigenous communities in Bayano are less likely to focus on this method for identity issues (Emblematic species) (Personal communication, 2018; see Smeaton & Rivera-Fagan, 2010). As discussed in interviews with Indigenous individuals, avoiding poverty is often a pressure to switch to cattle, targeting Affluence (see Smeaton & Rivera-Fagan, 2010). As discussed by Brunet and Lafortune (2010), regarding a carbon sequestration project, fencing is necessary to protect crops and vegetation from cattle. This would fit with the Technology Parameter. Education and Ethics would play a role, as individuals, particularly younger individuals, could be taught, pragmatically, other ways of livelihood without cattle (including fruit tree reforestation projects). More indirectly, they could learn about the cultural methods of the Indigenous community. As discussed in the article, a path of influence could be created. While concrete numbers are not available for a current articulation, the HWC Impact equation could be applied in the future. Chapter 10 Bayano Stakeholder Table

10.1 Introduction and citation for article

This is the culmination of the other works in the thesis. The version of the document in this thesis has since been submitted to *Challenges in Sustainability*, has undergone peer review, has been accepted and is currently undergoing final editorial approval. It can be cited as: Yahya Haage, (2023). Creating a Stakeholder Table, Identifying Hidden Stakeholders, Exploring Relational Interventions and Potential Reparations, for the Bayano Region of Panama. [accepted in *Challenges in Sustainability*]

10.2 Article: "Creating a Stakeholder Table, Identifying Hidden Stakeholders, Exploring Relational Interventions and Potential Reparations, for the Bayano Region of Panama"

## <u>Abstract</u>

The Bayano region, in Panama, has been linked to many different stakeholders who were or are influenced by the Bayano dam, which was completed in 1976 and flooded a large area. Stakeholder Tables are a good way of exploring the views of stakeholders and their relationships. They can also help in identifying Hidden Stakeholders. Hidden Stakeholders refer to stakeholders who use or are impacted by regions or events, but are generally ignored. In this study, several sources, including discussions with community members and workshop results, were used to develop a Stakeholder Table for the Bayano region. Stakeholders include displaced Guna and Embera indigenous communities. In order to identify Hidden Stakeholders, the table was applied to relevant court cases and agreements, with Hidden Stakeholders being those who were not addressed in these documents. Hidden Stakeholders include indigenous individuals who raise cattle or are involved in tree felling, along with tourism industries. Using some follow-up workshops to collect potential interventions and examples of reparations, a Relational Values approach was used to find sustainable projects and methods that can target multiple Hidden Stakeholders at the same time.

#### **Introduction**

Historically, the Bayano Dam, in Panama, has had links to many stakeholders who are/were influenced by this development project. Past works dealing with the region have included different stakeholders, from indigenous individuals to government employees (Smeaton & Rivera-Fagan, 2010; Wali, 1989b). One method to approach stakeholders is through a Stakeholder Table. A Stakeholder Table can help place stakeholders and their needs in a simple, understandable manner. A Stakeholder Table is defined as a useful method to "aggregate information on the different stakeholders" (Vogler et al., 2017). Both the name of a stakeholder group and their positions are included, giving an easily accessible resource. Relationships between stakeholders can be clearly seen through these tables and, by understanding the stakeholders, "Hidden Stakeholders" and their views can be identified. As such, in many regions, it can also be a first step in creating a framework for decolonization, particularly by identifying stakeholders with low power. Regarding Hidden Stakeholders, these are groups that rely on certain resources but "whose participation in public stakeholder decisions is not normally considered" (Vogler et al., 2017).

Several Stakeholder Tables have been created that act as templates to the one developed in this study. For instance, tables have been built for hypothetical conservation efforts for a dam project (Vogler et al., 2017), as well as vehicle use (Beetham, 2015). Considering power dynamics is also key to identifying Hidden Stakeholders (Meester & Ezzeddine, 2021). In the case of this study, the inclusion of stakeholders in court cases, legal documents, and agreements, aid in understanding power dynamics, as Hidden Stakeholders are often low in the power scale. The Bayano region is the site of interest for this study. The Bayano region has been affected by a dam development project, completed in 1976, which flooded a region of the tropical forest and led to the relocation of indigenous Guna, Embera, and non-indigenous Campesinos (Wali, 1989b). The negative repercussions, such as land tenure disputes and ecological devastation are still linked with this development project (IACHR, 2012b; Gabriel Yahya Haage, 2019a). Relevant academic work has also been conducted in another Panamanian hydroelectric project, Chan-75, including creating a stakeholder list (Barber, 2008). However, a comprehensive Stakeholder Table for a Panamanian dam has not been fully developed. Developing a Stakeholder Table, and using it to find Hidden Stakeholders, is a worthy endeavor in this region, particularly as there are clear uneven power dynamics (see Gabriel Yahya Haage, 2019a).

The application of a Stakeholder Table to relevant court cases, legal documents, and agreements, (here referred generically as "legal documents") is novel to this study, which is interesting as such documents often discuss and mediate between stakeholders. They can also cause a shift in power dynamics for the stakeholders considered, through their declarations and judgments. Furthermore, they can help elucidate the relationships among different stakeholders, including between the goals of the stakeholders and the relationships between stakeholders and the legal documents. As such, a Relational Values perspective is of use in understanding these relationships. Relational Values go beyond the intrinsic/instrumental dichotomy to consider relationships (Deplazes-Zemp & Chapman, 2021; Spash & Smith, 2021). In a Relational Values perspective, the relationships themselves are seen as important, rather than means to an end, which is particularly instructive when indigenous communities are involved (see K. M. A. Chan et al., 2018). In the results of the follow-up workshops done for this study, an attempt is made to

consider the relationships between stakeholders and thus find ways of including and satisfying, through sustainable actions and projects, the needs of as many Hidden Stakeholders as possible.

To achieve such synergetic solutions, finding which Hidden Stakeholders are missing from these legal documents is of paramount importance. After all, despite being "hidden," these stakeholders will be impacted by legal documents. Legal documents can act as sources of leverage, as they grant power to at least one group of stakeholders, along with the backing of the court or government to use this power. Of course, the validity of the legal documents can be contested, but they remain a good source for the discussion of stakeholders.

Detailed Information on the Study Site (Bayano Region)

The study site is the Bayano watershed (River Basin 148 in the list of Central American river basins), which has a surface area of around 5000 km<sup>2</sup> (ANAM (Ministerio del Ambiente), 2015). This watershed, which will be referred to more generally as the Bayano region, is part of the Darien region in the east and terminates in the Chepo District in the west (Canal de Panama, 2016). The region has been studied before, including the monitoring of forest cover changes (D. Sharma, 2015) and the study of indigenous groups (IACHR, 2012b; Gabriel Yahya Haage, 2019a; Gabriel Yahya Haage & Lee, 2022).

Ecologically, the region consists of a humid tropical forest. Increases in modern agriculture, deforestation and cattle raising have all decreased its extent (ANAM (Ministerio del Ambiente), 2015; Urieta Donoso, 1994). The Bayano dam reservoir, also called Bayano lake, was created in 1976 and is the greatest environmental change. It is linked to the aforementioned issues (IACHR, 2012b). It has also led to increases in insect and water-borne diseases (Wali, 1989b). The flooding led to the relocation of several non-indigenous (Campesinos) and indigenous communities (Wali, 1989b). The Bayano watershed is home to the indigenous Embera and Guna (Wali, 1989b). The Guna communities have two areas considered Comarcas (reserves), namely Guna Yala and Guna Madungandi (ANAM (Ministerio del Ambiente), 2015). A Comarca is a section of land for which the indigenous communities within it are legally allowed to determine how their resources should be used (IACHR, 2012b). They can also, at least theoretically, apply their own governance and maintain their internally chosen political systems (IACHR, 2012b).

Only a small portion of Guna Yala is found in the Bayano watershed. However, the Guna Madungandi Comarca falls squarely within this watershed (IACHR, 2012b). The Guna Madungandi Comarca was established in 1934. There have been some legal challenges regarding this designation but the government has generally recognized its land tenure status (Wali, 1989a).

The Embera are more recent arrivals in the region. The first Embera family moved to the Bayano region in the 1950s (Urieta Donoso, 1994). This was followed by other Embera families, who began moving into the Bayano region in the 1950s and 1960s. Unlike the Guna, who established several village-level communities, the Embera have traditionally lived in small extended family household units (Urieta Donoso, 1994; Wali, 1989b). The largest settlement before the dam was Majecito, which was developed in 1970 and was the result of the coming together of a few Embera families, under a charismatic leader (Urieta Donoso, 1994; Wali, 1989b). There are no recognized reserves for the Bayano Embera (Wali, 1989b).

The planning and construction of the Bayano dam spanned from 1969 to 1976. The relocation of the communities in the region, including the Guna and Embera, took place from

1973 to 1975 (IACHR, 2012b). The Bayano dam reservoir flooded 80% of the Guna Madungandi reserve (Wali, 1989a). The Guna were relocated to other parts of their reserve, were promised that their reserve would be redemarcated as soon as possible, and that the government would ensure they would be protected from others invading their land (IACHR, 2012b). It took decades before the redemarcation of the reserve took place, occurring in 1996 (IACHR, 2012b). However, conflicts with some non-indigenous invaders continued (IACHR, 2012b).

In advance of the flooding, the Bayano Embera were mostly resettled to the towns of Ipeti Embera and Piriati Embera (IACHR, 2012b). This was a great social shift as Embera do not traditionally reside in village-level settlements (Wali, 1989b). Several Embera families subsequently moved away from these villages, to settle elsewhere (Wali, 1989b). One reason for this move was to be closer to their agricultural lands (Wali, 1989b). Unlike the Bayano Guna, the Embera, not having a reserve in Bayano, had a weaker position when arguing for their land tenure rights (Wali, 1989b). As one example, they mostly had to deal with the Bayano Corporation, with only limited access to the government of Panama (Wali, 1989b). Piriati Embera and Ipeti Embera eventually received some land tenure status, namely as Tierra Collectivas or Collective Lands. Piriati Embera received this status in 2014 and Ipeti Embera received it in 2015 (Mathieu Guillemette et al., 2017). For other Embera groups in the Bayano region, like the Union Embera and the Maje Embera communities, the regions they inhabit have not yet been given any meaningful land tenure recognition (Mathieu Guillemette et al., 2017).

## **Material and Methods**

## Outline of Steps

This study went through a series of iterative steps:

-A Stakeholder Table for the Bayano region in Panama was developed. The sources, discussed in detail below, included 14 workshops with participants involved in sustainability,

environmentalism and/or biology.

-Once developed, the Stakeholder Table was applied to relevant legal documents linked to the region, to find Hidden Stakeholders. Hidden Stakeholders are those not discussed in the legal documents.

-Three follow-up workshops were conducted to find appropriate ways to include some key, but ignored, stakeholders. To create a leverage point for the inclusion of stakeholders, a Hidden Stakeholder with a potentially strong influence was determined based on the sources. Potential interventions of this prominent, yet hidden, stakeholder were explored. These potential interventions also seek to have a strong decolonization component, particularly when discussing hidden indigenous stakeholders.

-Once Hidden Stakeholders were identified, the potential inclusion of these stakeholders is discussed. This included a discussion of potential reparations, with reparations defined as the "action of making amends for a wrong or harm done by providing payment or other assistance to the wronged party" (Oxford English Dictionary, 2009). By taking a Relational Values perspective, in which the relationships between stakeholder groups is front and center, sustainable methods that target multiple stakeholders with a single action or project, are emphasized. A similar process was previously performed in regards to water poverty, Children's Rights, and the Bayano region (Gabriel Yahya Haage, 2019a).

## Brief Overview of Sources

In this study, a Stakeholder Table was created for the Bayano region, based, in part, on past documents discussing the Bayano dam and region, testimonials from indigenous individuals in the Guna Yala reserve, field notes from other researchers with individuals affected by the Bayano dam, feedback from inter-coders who read documents related to the Bayano dam (the inter-coding was done primarily for a distinct, but related project), the input from participants in Sustainable Development Goals (SDG) and Human-Wildlife Conflicts (HWC) workshops, a workshop with the Maje Embera done by the author, previously published in a report based on the region, and, finally, casual conversations with key informants. The sources are described more fully below.

## Setting up Sources Through Snowball Sampling

Past work has been done regarding methods for finding stakeholders and how they can be combined to find stakeholders that are ignored or overlooked (Bahr, 2015). For instance, using the local knowledge of experts can be a starting point for an inclusive "Snowball Sampling" method of determining stakeholders, which is done by asking identified stakeholders to identify other "people and organizations that they consider to have a stake in the issue" (Bahr, 2015). Furthermore, this can be supplemented with a "key informant method" in which "stakeholder nominations come from well-connected members of the domain, who may not have a stake in the issue themselves" (Bahr, 2015).

A Snowball Sampling method was used as often as possible for this study. For instance, a key informant in the Maje Embera community, the chief's brother, was asked to identify key individuals to participate in a workshop with his community. The results of this workshop, consisting of ten participants, were published as part of a report on water poverty (Gabriel Yahya Haage, 2019a). A particularly helpful input was what the workshop participants felt was necessary for their community to thrive (Gabriel Yahya Haage, 2019a).

Further information was gathered from 14 workshops (147 participants) on the Sustainable Development Goals and Human-Wildlife Conflicts. These workshops were also established using a Snowball Sampling methodology, where individuals involved in biology, environmentalism and/or sustainability would be asked to identify other individuals with similar expertise. These participants may not all have a stake in the Bayano region, but they are involved and have expertise in relevant fields. As such, they could fit in the "key informant method" discussed regarding this type of sampling (see Bahr, 2015).

#### Sources

A deeper dive into the sources will be helpful in understanding the complexity and interrelations that occur in the Bayano region. Where applicable, ethics approval was obtained from McGill University REB (#20-02-027 and #37-0617).

Source 1: A series of workshops, namely 14 on the Sustainable Development Goals and 14 on Human-Wildlife Conflicts. These workshops were run during 2020 to 2021 and had a total of 147 participants for each type of workshop. The two workshops were run back-to-back, in a roughly two hour period. Questions which were discussed in these workshops were used to shape the Stakeholder Table. For instance, one question asked who should be involved in reducing Human-Wildlife Conflicts. While this question was not asked specifically for the Bayano region, the results are relevant when considering the region, particularly as the Bayano region stakeholders are impacted by and have impacts on wildlife. For instance, deforestation in the region threatens the wildlife, as expressed by both academics (Wali, 1989b) and local individuals (see Gabriel Yahya Haage, 2019a). Participants each received 50 Canadian dollars for each of the two workshops (Human-Wildlife Conflicts and Sustainable Development Goals). Notetakers, where needed, received an additional 50 Canadian dollars per workshop. Source 2: In ten workshops (101 participants), a hydrologically-based case study was presented, and participants were asked which Ecosystem Services (ES) could be espoused to protect the region. It was made clear that ES is only one way to address issues, but it was the one for this case study. Hydrological conflicts are front and center in the case of the Bayano region, not only in the dam itself, but also the fact that a region was named a hydrological reserve, making achieving land tenure rights difficult for the indigenous communities in that region (Mecha, 2018). The workshop participants were a subset of those who took part in the 14 workshops mentioned in Source 1. This hydrologically-based activity was undertaken if there was time after other workshop activities.

Source 3: In addition to the above, documents related to the Bayano dam were read through and stakeholders were noted when they were discussed. The 302 documents were found by searching several databases (PubMed, Ebesco Host, Factiva, Web of Science, ProQuest, ECOLEX, FAOLEX, Gale Newsvault, Google Newspaper, Hispanic American Periodicals Index (HAPI), JSTOR, Redalyc, Scopus, Wiley Online Library, and the World Bank document database), for the search terms "Bayano AND dam," "Bayano AND presa" and "Bayano AND represa." Beyond the databases, if a document mentioned another that seemed relevant, it was, whenever possible, tracked down and considered.

Source 4: A set of the documents (220 out of 302) from these databases were given out to other thematic coders. These seven individuals were first briefed on the Bayano region and its history. Among their final submissions were a list of stakeholders in the documents and any themes that they felt were missing from the documents.

Source 5: Casual discussions were also conducted with the chief of the Maje Embera and his brother. Notes were not taken during these casual discussions, but stakeholders discussed were

written out after the discussions. Topics of discussion encompassed the conflicts with Campesinos, the younger generation of indigenous community members, and the need to recover our indigenous background, including as regards my own Quechua ancestry.

Source 6: Since further widespread interviewing of Bayano region communities was not possible, mainly due to isolation and time constraints, other sources were brought in to understand the situation. For instance, the field notes of other researchers in the Bayano region were used (see Smeaton & Rivera-Fagan, 2010). These researchers interviewed key individuals with a stake in the region (Smeaton & Rivera-Fagan, 2010).

Source 7: Similar to the above, the testimonials from individuals in the Guna Yala reserve, as found in an edited volume, were also considered (see Ventocilla, Herrera, Nùñez, & Roeder, 1995a). Many of these came from individuals who were key to their communities and understood the issues of the region.

#### Creating the Stakeholder Table

The methodology was generally straightforward. First, a sample of 50 documents was taken from the documents collected from databases, a common process in thematic and content analysis (see Gale et al., 2013; see Pickering & Byrne, 2014). This was done to get an initial understanding of the stakeholders involved. This then helped guide the search for stakeholders when reading through all the sources of information, including the workshop results and fieldnotes. When a relevant stakeholder was mentioned, it was noted. These were then grouped together into illustrative categories (see Table 1). Some overlap between categories is unavoidable, as stakeholder relations are quite complex. The working Stakeholder Table was subsequently checked by an individual familiar with writings related to the Bayano region, who had also acted as an inter-coder for a related project. The same individual was asked, based on

the documents they read, to list the key stakeholders based on level of power and influence during the dam construction period.

Once completed, the Stakeholder Table was applied to legal documents linked to the Bayano region. These range from accords between the Panamanian government and Bayano communities, to legal decisions of the Inter-American Commissions on Human Rights, to cases in American courts linked to relevant regional resources. These were chosen as they are "official" documents meant to address stakeholder interests and manage disputes. When a specific document could not be found, summaries of the main articles, found in other works, were used. The full list of documents is found in Table 2. The legal documents were searched for the stakeholders in the Stakeholder Table. The stakeholders which were not found in any of the legal documents were labelled as Hidden Stakeholders. While the process was kept wide in this project, considering all legal documents, future works may choose to consider only a specific set of legal documents, perhaps separated by segments of time.

The Stakeholder Table includes animals, nature, the indigenous communities, stakeholders linked to the resources, and others. Some stakeholders also have links to other stakeholders in Bayano. As such, relationships are key to understand the situation, especially when the communities are strongly linked to nature, as with indigenous groups. As discussed in detail below, in order to find holistic and relational links between Hidden Stakeholders, along with potential reparations, three follow-up workshops, with 44 participants, were conducted. This and a Relational Values approach aided in developing related ways of targeting multiple Hidden Stakeholders.

## **Results and Follow-up Work**

Based on the above, the Hidden Stakeholders were determined to be:

- The older versus younger generations of Guna and Embera communities (although the Inter-American Commission on Human Rights court case did discuss that traditions are passed on through the generations).
- 2. Indigenous community-members that participate in cattle raising and deforestation. This is strongly linked with the first Hidden Stakeholder group.
- Individuals in western Panama, and specifically the Zonians (individuals living in the Panama Canal Zone).
- 4. Tourism industries.
- 5. Individual nonhuman animals.
- 6. Financial institutions like the World Bank. While there were mentions of the Panamanian government supplying money, and looking at external sources, the external financial institutions, like the World Bank, were not explicitly mentioned by most sources. An Inter-American Commission on Human Rights document mentions the term World Bank in a footnote, but did not go into any detail regarding it. As a key stakeholder, the lack of discussion can place it in the Hidden Stakeholder category.

## Follow-up Workshops

Once Hidden Stakeholders were identified, three follow-up workshops (44 participants) were done with individuals involved in the field of sustainability, environmentalism and/or biology. The participants had all been involved in at least one of the 14 workshops mentioned in Source 1. Which specific individuals were chosen was determined mostly through interest and availability. Participants each received 50 Canadian dollars for their participation and notetakers received an additional 50 Canadian dollars. The goal of the workshop was to create an understanding of the relationships between Hidden Stakeholders and how they can be jointly

addressed. The stakeholder used to kick off this exploration were the financial institutions, particularly the World Bank. It should be noted that these results could potentially been different if other types of stakeholders were part of the workshops.

This choice is notable as another thematic coder, who was given a set of documents from throughout the history of the Bayano region, and who was tasked with labelling stakeholders from most to least influential during the Bayano construction period chose the construction companies in the first position, followed by the financial institutions. As such, financial institutions like the World Bank were quite influential while also being Hidden Stakeholders. They were thus chosen as a starting point and potential leverage point to relate to the other Hidden Stakeholders.

Once the financial institutions are categorized as Hidden Stakeholders, one may ask whether they are still relevant decades after the dam was completed. The three follow-up workshops sought to gauge perceptions on the current responsibility of funding institutions, in particular the World Bank, in cases like the Bayano dam. Participants were presented with the case study of the Bayano region, including a mention of the role of financial institutions in their funding of the project. Participants were asked, through polling, who should be held accountable presently for the issues that the Bayano dam, completed in 1976, has caused.

Participants were also asked what was the top choice for how the financial institutions could aid the region of Bayano. As individuals with involvement in relevant fields, their responses can act as a gauge of the attractiveness of these ideas. The options given were based on the results from the workshop with the indigenous Maje Embera community, specifically regarding what their communities needed to thrive (see Gabriel Yahya Haage, 2019a). They were also based on the demands of the Bayano Guna and Embera for their court case in the InterAmerican Commission on Human Rights (IACHR, 2012a). The choices were: Payment to indigenous leaders, infrastructure projects, afforestation and reforestation projects, ecotourism projects, explicitly advocating for indigenous land tenure rights, and, finally, that they should not be involved at all. The participants were polled two more times, to allow them to give their second and third choices.

## Follow-up Workshops Results

For the first follow-up workshop (13 participants), 38% felt the financial institutions should be held accountable. For the second workshop (13 participants), 62% felt the financial institutions should be held accountable. For the third workshop (18 participants), 50% felt financial institutions should be held accountable for past development projects. The results show that there is a variable belief that the financial institutions involved with the construction of the Bayano dam should be held accountable in the present, ranging from roughly 38% to 62%. Even at the low range, there is a notable number of individuals who feel there should be a level of accountability. This is key in trying to implement ways of connecting Hidden Stakeholders, using the financial institutions as a leverage point.

The top choice for workshops 1 and 3 was "payment to indigenous leaders." The top choice for workshop 2 was to "explicitly advocat[e] for land tenure." The participants were also asked for their second and third choices. The second and third choices for Workshop 1 were "explicitly advocating for land tenure" and "afforestation and reforestation projects" respectively. The second and third choices for Workshop 2 were a tie for the second choice ("payment to indigenous leaders" and "afforestation and reforestation projects") and, for the third choice, participants chose "afforestation and reforestation projects." The second and third choices for Workshop 3 were "explicitly advocating for land tenure" and "supporting

infrastructure projects." For the sum across the three workshops, the top choice was "payment to indigenous leaders". The second choice was "explicitly advocating for land tenure rights." The third choice was a tie between "afforestation and reforestation projects" and "supporting infrastructure projects." This, in addition to the previously published Embera workshop results, show how people consider reparations from funding bodies.

## **Discussion**

Once the Hidden Stakeholders were identified, one can ask how these can be included and aided. The perspective of Relational Values is helpful here, as all Hidden Stakeholders have not only different relationships to nature, but also to each other. The values they give to the natural world can vary, say from the World Bank to indigenous cattle raisers, but the relationships between them are clear. As such, as in a similar project based on the Bayano region, an effort will be made to target several of these stakeholders simultaneously with a few key sustainable projects (Gabriel Yahya Haage, 2019a). First, an understanding of the Hidden Stakeholders will prove useful.

The importance of considering these Hidden Stakeholders will be discussed here. In several cases, the history of the Bayano region demonstrates that these are important stakeholders to consider.

1. Stakeholder: The older vs younger generations, along with the indigenous who perform cattle raising and deforestation.

As discussed in detail elsewhere, the indigenous groups in Panama put importance in passing their cultural lifeways to the future generation (IACHR, 2012b; Torres & Nunez, 1995; Ventocilla, 1995). This is important, as changes in the region run the risk of reducing their way of life, as discussed elsewhere (IACHR, 2012b). Unfortunately, as lamented in the testimonials

of older Guna in Guna Yala, the younger generation often does not follow the lifeways of the Guna, both in how they make a living and in ways of thought (Torres & Nunez, 1995; Turpana & Nunez, 1995). An important past work on the Bayano region communities also discusses how there was tension between those indigenous individuals who hold traditional lifeways, and those who do not (Wali, 1989b). For instance, that deep analysis of the communities affected by the Bayano dam discusses how some indigenous individuals worked in tree felling and the tensions this caused with other indigenous individuals (Wali, 1989b). Similarly, research on the "Mesas de Concertación" also discuss how some indigenous individuals in Bayano communities are involved with cattle raising, with the detail put in that they are doing this out of financial necessity (Smeaton & Rivera-Fagan, 2010). Perhaps the most extreme example of outsider influence was in a Guna community, in which a syncretism of Guna lifeways and Christianity led to a very materialistic mentality (see Moeller, 2006). As is clear from these examples, indigenous lifeways are not fixed. Furthermore, tensions can exist between older and younger generations, as well as indigenous individuals subsisting from the professions more common to the nonindigenous Campesinos. There is some power of members of the community to police these variations, as discussed by Wali (1989b) but there cannot be total control of the ways of life of all individuals in a community, particularly when individuals are the legal owners of a parcel of land. Certainly, it is important to not consider indigenous communities as being necessarily unchangeable or static, a topic discussed in past literature (Rice, 2014). All cultures change, including indigenous cultures. There are also often tensions between the older and younger generations in many cultures beyond those labelled as indigenous. However, the total extinction of a culture is lamentable and the tensions between older and younger indigenous generations, as well as other pressures, put this as a distinct possibility. This is also unfortunate as it cannot be

denied that the traditional ways of life of the indigenous communities of the Bayano region have had less impact on the forest ecosystem than those of outsiders. In fact, this was articulated by the Panamanian government before the relocation (see Wali, 1989b). As such, a specific and beneficial bio-cultural relationship with nature could be lost. This Hidden Stakeholder suggests that, when outlining the needs of communities, as well as the legal responsibilities of those in power, an effort should be made to explicitly encourage the passing of culture from one generation to another. This can be done through setting a curriculum in education which includes these topics, so the younger generation can be exposed to these ideas. The loss of culture through standard education is one of the reasons given by Guna advocates as to why the younger generation is drifting from traditional ways of life (Turpana & Nunez, 1995). Beyond this, creating a safety net so indigenous individuals are less likely to need to resort to ways of making a living like cattle raising and tree felling would be commendable. One method that could be supported has already been applied in the Bayano region, namely paying landowners for afforestation and reforestation. This REDD+ project in an Embera community was done with support from the Smithsonian Tropical Research Institute (STRI) (Holmes, Potvin, & Coomes, 2017). Such methods are ways in which other nations can offset their carbon by paying for afforestation and/or reforestation (Potvin et al., 2006). Trees which have both environmental and financial value, such as fruit trees, were part of the program. This "proof of concept" for sustainable interventions in the Bayano region was considered a success. As such, pressure should be put on the Panamanian government to set up such a system with indigenous communities in the region. It would have beneficial effects both in terms of ecology and cultural survival.

2. Stakeholder: Zonians and other Panamanians elsewhere.

Panamanians in other regions in Panama fit as a Hidden Stakeholder that must be addressed. They push for greater energy production, both directly, such as petitioning the government, and indirectly, such as through urban growth. In fact, as discussed elsewhere, the Bayano hydroelectric dam produced energy for mostly other parts of Panama, including Panama City (Wali, 1989b). However, the detrimental impact generally falls on those in the Bayano region. When one discusses the legal obligations of society, it is important to consider these geographical inequalities and power dynamics, which can sometimes be remedied with taxation. For energy access and detrimental environmental impacts, the Not in My Back Yard mentality can definitely play a role (see Buffoli, Odone, Leask, & Signorelli, 2016). Seeking local solutions to energy extraction can help in reducing environmental issues, since some of these issues will be unavoidably clear. One of the key reasons the Panamanian government set out to build the Bayano dam was as part of an attempt to achieve more energy independence (Wali, 1989b). The needs of Panamanians in cities was put above indigenous needs, particularly as the fact that the dam was going to be built was a given, and the indigenous communities could argue about compensation but not whether the dam would be built at all (IACHR, 2012b).

3. Stakeholder: Tourism industries.

Although the region was quite difficult to penetrate in the past, some tourism was taking place even before the Bayano Dam opened up the region to more outsiders (Hanbury-Tenison, 1973). These were sometimes led by guides who also captured and sold wildlife (Hanbury-Tenison, 1973). Modern tourism in the region has become more popular, with the Bayano Adventures enterprise being among the most elaborate, as it offers many activities, including a visit to a Bayano Embera community (Rodríguez & Saenger, 2019). Also, several communities in Bayano have or are hoping to create tourism industries for their community [Personal

communication, 2018]. Several issues have been discussed concerning indigenous groups and tourism. As discussed by others, some have criticized indigenous tourism as they can make a caricature of the indigenous, namely that what is shown to the visitors is an unchanging snapshot of indigenous life (Ingles, 2001; Lanteigne, 2019). Indigenous culture changes like any other and this can give the impression that it hasn't. As discussed in the literature, indigenous communities can find themselves playing "the role of the unchanged, primitive native" (Ingles, 2001). Others have argued that tourism can be good for indigenous communities as it can help expose their ways of life not only to outsiders but to their younger generation as well (Lanteigne, 2019). Another criticism of indigenous-based tourism is that the money does not reach the indigenous, rather they are put to menial tasks while capitalist-minded individuals from elsewhere reap the benefits (Dowie, 2009). To make a positive impact for the indigenous of Panama, the indigenous communities must, themselves, conceive of and run the tourism endeavors.

4. Stakeholder: Individual nonhuman animals.

This has been a key stakeholder since the dam's construction. For instance, a common subject of news articles during construction involved the Noah 2 project ("After the flood, in comes noah," 1976; Beynon, 1976; Dorschner & Battle, 1977; Hunter, 1977; Joanne, October 10, 1976). This project, led by the ISPA (International Society for the Protection of Animals), rescued nonhuman animals stranded in trees and islets due to the rising of the Bayano reservoir waters. Indigenous guides were often participants in such efforts. Even in modern times, individual nonhuman animals, or small communities of nonhuman animals, can be of importance to the indigenous communities. For instance, one of the conversations with a key informant led to my being shown a tree of spiritual significance to the community, along with the small group of bats that make it their home [Personal communication, 2017]. If this were lost, due to

environmental destruction, this Bayano community would lose one of their touchstones in the region. The importance of individual nonhuman animals can also conflict with the value of species. For instance, the Noah 2 project was criticized because the rescued animals, relocated to permanently dry land, could have a negative impact on the species there, although some disputed this (Omang, November 05, 1976). Relatedly, a researcher describes how an Embera shot a member of a threatened species in the region (Hutton et al., 2017). This was done to save their dog, reasoning that, without their dog, they and their family might not survive (Hutton et al., 2017). As such, individual nonhuman animals can play a key role for both the indigenous and non-indigenous.

5. Stakeholder: Non-governmental financial institutions.

The Inter-American Commission on Human Rights court document discussed the past and present funds going to the Bayano region, and the documents associated with the American courts discuss the payment of the construction of the Pan-American Highway (IACHR, 2012b; "Sierra Club v. Coleman ", 1976). Finally, the country of Colombia similarly was a player in funding development through the highway. However, non-governmental organizations are generally absent in the discussion of the Bayano dam, which makes the situation more complex but can also be enlightening. The World Bank would be a clear player when it comes to the Bayano dam. As mentioned above, the Inter-American Commission on Human Rights legal document mentions the World Bank as part of a citation in a footnote, but nothing more substantial. As discussed, the additional thematic coder placed financial institutions high on the list of institutions with influence on the dam construction. The World Bank influenced the politics of Panama regarding the dam, including when Torrijos made the energy sector a part of the Panamanian government, thus having greater assurances that it would be economically viable, as the Panamanian government would see to it that the industry would not fail (Wali, 1989b). Despite their general view of Free Trade, it is interesting that the World Bank only felt comfortable investing once the state expanded its power (Wali, 1989b). The investment in the Bayano dam construction has been subsequently seen as a bad way to invest in dams, particularly as it relates to relocation (Ledec & Quintero, 2003). The results of the polls in the three followup workshops show there is a substantial support, among workshop participants, that the financial institutions involved in the Bayano dam construction should help the communities even now, including through reparations. As the World Bank's contract has already been fulfilled, it may be difficult to argue they still have a necessary stake in helping the Bayano region, as discussed in a similar case (Johnston, 2018). Analogously, the Inter-American Commission on Human Rights court decision made it clear the court had no jurisdiction in events happening prior to the signing of the Inter-American Human Rights treaty (IACHR, 2012b). A dissenting decision, however, argued that this was not the case, as current issues are strongly linked to past decisions by the government of Panama (IACHR, 2012a). Furthermore, for the more recent Guatemalan Chixoy Dam, the World Bank and the Inter-American Development Bank have aided, including through the lending of expertise, the impacted communities even after project completion (Albertos, 2018; Johnston, 2004; Martínez & Gómez, 2019). As such, an argument could be made that the World Bank should pay reparations for the issues caused by the Bayano dam.

When considering Hidden Stakeholders, it can be useful to consider how they are or can be interrelated. This can help find sustainable solutions that target multiple stakeholders. A similar approach was used in a water poverty analysis of the Bayano region, considering children as the key stakeholders (Gabriel Yahya Haage, 2019a). From a Relational Value perspective, each of

these groups holds a diversity of relationships with the natural world (see Deplazes-Zemp & Chapman, 2021; see dos Santos & Gould, 2018). Relational Values are meant to be an alternative way of seeing nature beyond Instrumental and Intrinsic Values, although they can both be expressed in the relationships (Spash & Smith, 2021). Instead of considering them individually, one could look for solutions that can help ameliorate or reinforce the relationships to nature. Furthermore, Relational Values could be expanded to consider the relationships between other institutions, particularly when dealing with indigenous communities, as these combine the biological with the cultural (Russell, Ens, & Rangers, 2020).

The results of the three follow-up workshop polls discuss how the World Bank could help the communities even now. The indigenous communities should be aided, particularly through direct payments to indigenous leaders and through explicitly advocating for land tenure rights. Both these methods give more autonomy to indigenous communities and work towards decolonization. After all, in regards to indigenous communities, advances in "political (e.g. governance structures), legal (e.g. authority status of non-human kin) and economic (e.g. locallybased economies)" can be part of the "larger process of decolonisation and self-determination" (Huambachano, 2019). The discussion in that case revolved around indigenous food sovereignty, but can be applied more generally. Of course, the afforestation and reforestation projects, as well as infrastructure such as schools, can also aid indigenous communities. In fact, in the recent workshop with the Maje Embera community used as one source in this study, access to education and health were considered two things needed for the "community to thrive" (Gabriel Yahya Haage, 2019a). It should be noted, as argued by some Guna indigenous scholars, that the right curriculum should be applied, which includes not only the basic universal educational components, but also subjects that help educate students on their indigenous culture and

traditional knowledge (Turpana & Nunez, 1995; Ventocilla, 1995). Teaching students the language of their indigenous group is one component that has been discussed in Guna Yala (Turpana & Nunez, 1995). In terms of afforestation and reforestation, as mentioned above, a past project aided by the Smithsonian Tropical Research Institute (STRI), has helped an indigenous community in the Bayano region (Holmes, Potvin, et al., 2017).

As such, holistic methods to ameliorate the relationships between stakeholders and between stakeholders and nature can be sought, by using financial institutions as a leverage point. As an example, the financial institutions could invest money in reforestation and afforestation projects, which could then be used for ecotourism by the community. These projects could encourage the younger generation to become involved in ecotourism and forest protection, particularly if the projects occur where they live. Tourism institutions can be detrimental to the local individuals, particularly if the financial advantages don't go to locals (Dowie, 2009). However, a situation is possible where locals benefit and younger generations can learn about their ancestry, as is the case for some communities in the Chagres region of Panama (Lanteigne, 2019). Even protecting individual or small populations of animals can become part of the ecotourism efforts. Furthermore, having institutions like the World Bank explicitly advocate for their land tenure rights, combined with offering money to the indigenous leaders, who may know where best to use the money regarding fighting for those rights, such as legal fees, could be used to support a more robust ecotourism effort.

#### **Conclusion**

In conclusion, the novel way of finding Hidden Stakeholders, by applying a Stakeholder Table to legal documents, can be enlightening. Once identified, a Relational Values approach can target the different stakeholders through holistic and sustainable interventions, always keeping the relationships between stakeholders, as well as those of stakeholders with nature, in mind. Such methods can even approach the topic of reparations.

		Positions/ Views
	Guna generally	Getting their land and rights
		recognized
	Guna collective	Working for Guna groups
	organizations	throughout Panama
	Guna younger	More acceptance of outside
	generation	overharvesting methods and
		agriculture
	Guna older	Maintain older harvesting and
Guna	generation	growing methods
	Guna Madungandi	Maintain their independence and
		get protection from invaders
	Guna cattle raising	Indigenous moving away from
	and deforestation	traditional subsistence methods
		(can be more common in younger
		generation)
	Guna displaced	Get their land protected from
		invaders

# Table 1. The Bayano Region Stakeholder Table

	Embera generally	Get land tenure and culture rights
		recognized
	Piriati and Ipeti	Get more expansive official rights
	Embera	to their land and get invaders
		resettled
	Other Bayano	Get their land rights recognized
	Embera e.g. Maje	
	Embera	
	Embera younger	Greater acceptance of
	generation	overharvesting methods and
Embera		modern agriculture
	Embera older	Maintain older harvesting and
	generation	growing methods
	Embera in eastern	Protect their Comarcas in the east
	Panama (Comarcas)	of Panama
	Embera collective	Working with other groups to
	Bayano	achieve their land tenure and
	organizations	culture protection goals
	Embera displaced	Get land tenure recognized and
	(collective lands and	protected
	unrecognized lands)	

	Indigenous raising	Indigenous moving away from
	cattle and	traditional subsistence methods
	deforestation	(can be more common in younger
		generation)
Other Panamanian communities	Other Panamanians	Maintaining their rights and
	in the west of the	connections to other countries
	nation, including	
	Zonians	
	Campesinos	Getting their land tenure
		recognized for where they settled
	Religious groups	Offering spiritual care and living
		a spiritual life
Corporations	Large cattle raising	Making a viable business through
		cattle raising
	Financial	Making worthwhile investments
	firms/money lenders	
	Hydroelectric firms	Function effectively in offering
		electricity to parts of Panama
	Other energy firms	Function effectively in offering
		electricity to parts of Panama
	Construction firms	Making money in construction
	Tourism by	Making money for the
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	indigenous	community and perhaps maintain
	communities	their culture
	Tourism by	Making money through tourisms,
	outsiders	perhaps use it for conservation
	Fisheries	Making a profit through fishing,
		including in the Bayano lake
		(mostly for tilapia)
	Lumber companies	Making money through tree
		felling
	Panamanian	Maintaining advances in
	government	development while not causing
	generally	issues with citizen groups
	Government	Representing the government and
	officials	being a go between with local
Government		groups
	Health system	Offering health care to
	(available hospitals)	communities
	Education system	Offering quality education to
		communities
	Other nations	Interest in the development of
		Panama, especially the Trans-

		Atlantic highway and the Panama
		Canal Zone
	Emergency services	Offering aid when emergencies
		occur
	Bayano	Tasked with developing the
	corporation/AES	region and making it profitable
	Species welfare	Protecting species and the
	groups/ Sierra	environment
	Club/conservation	
	groups	
	Epidemiologists	Understanding and preventing
		disease in the region
	Ecologists/biologists	Understanding and protecting the
Science and		ecosystems in the region
nature	Anthropologists	Understanding the customs, life-
		ways and needs of the community
	Other scientists	Playing diverse roles
	The ecosystem	A complex natural system
	(spiritual)	important to the spirituality of a
		group
	The ecosystem	A complex natural system worth
	(scientific)	protecting

	Individual	Sentient beings deserving a
	nonhuman animals	reduction of suffering
	Individual species	Conserving species of importance
		culturally or to an ecosystem
	Land and nature	Components of secular and
		spiritual importance worth
		protecting
	National	Funding of construction in
		Panama (e.g. Inter-American
Courts		highway)
	International	Advocating and declaring when
		internationally recognized rights
		have been violated
Law organizations	National	Determining the rights of
		Panamanians
	International	Determining the rights from an
		international standing
	Lawyers	Working to uphold the law
Other forms	Customary laws	Protecting the life-ways of the
of law		Indigenous groups

Table 2. Court cases, legal documents, and agreements considered.				
Sierra Club v. Coleman (405 F.	Injunction on the extension of the Trans-			
Supp. 53 (D.D.C. 1975))	American highway.			
Sierra Club v. Coleman (421 F.	Court case upholding the injunction.			
Supp. 63 (D.D.C. 1976))				
Sierra Club v. Adams (578 F.2d	Court case removing the injunction.			
389 (D.C. Cir.1978))				
Kuna Indigenous People of	Inter-American Commission of Human			
Madungandi and Embera	Rights court legal document (IACHR).			
Indigenous People of Bayano				
and their Members, Panama				
(2012 and 2014) (Report No.				
125/12 Case 12.354, Merits and				
Final Judgment)				
Demonstration Learn NL 72 (2008)	Establishes a way of tenuring indigenous			
Panamanian Law No. 72 (2008)	communities outside of reserves.			
Panamanian Law No. 24 (1996)	Establishes the modern Madungandi Reserve.			
Agreements of Majecito (1975),	These agreements with indigenous groups are			
Farallon (1976), Fuerte	quoted in IACHR documents.			
Cimarron (1977), and Espriella				
(1980).				
Several relevant sections in the	Based on those referenced in the IACHR			
American Convention of Human	court documents.			
Rights (1979)				

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## 10.3 Additional discussion of the article

As mentioned, this is the culmination of the previous articles and is quite expansive in scope. It relies on a Relational Values perspective, as each stakeholder has some view on the Bayano region, mediated by what their main goal is. Key to this is that, generally, the relationship is considered vital as well. For instance, for "spiritual ecosystem," the relationship with the ecosystem is seen as important. Even more prosaic stakeholders, such as businesses, usually act in a way that is influenced by a general perspective or business philosophy. Several such philosophies have been discussed in the literature (Miesing & Preble, 1985). While it would not be possible to understand the entire Good Life for each stakeholder, their goals can give some idea of what they think is important to thrive. Notably, while some of these are not "nature-inclusive" relationships, they are key to consider for a proper understanding of stakeholders linked to a region and its resources. It should be noted that "nature-inclusive" relationships could also be connected to misunderstandings of nature, as in the business ethic framed by Darwinian competition (see Yahya Haage, 2018).

Creating synergistic solutions is a key aspect of this article. These were based on the exploration of the documents and concepts in the previous articles. This is just one method of finding synergies for the Hidden Stakeholders. Another might be to use a branching structure, with different nodes corresponding to different stakeholders and values could even be given for different branches. This possibility is discussed further in this thesis' general discussion section.

It should be understood that the World Bank is a highly influential stakeholder in the development of Bayano, as noted by one of the intercoders. It certainly influenced the

Panamanian government. For instance, it was a driving cause for the nationalization of the electricity production industry in Panama (Wali, 1989b). It is thus interesting that it was a Hidden Stakeholder when legal documents were consulted. After all, the legal documents did discuss funders, such as the nation of Colombia ("Sierra Club v. Adams," 1978). Beyond this, the legal documents included some from the Inter-American Commission on Human Rights, which was tasked specifically with exploring the impacts of the Bayano dam on the Indigenous communities in the region (IACHR, 2012a, 2012b). Despite this, the World Bank does not play a strong role in the documents.

Other assessments of Hidden Stakeholders may omit the World Bank, but it is interesting that such an influential stakeholder is not found in the legal documents. Perhaps this realm of society does not put as much emphasis on such funders. This may be partly due to their financial obligations being considered concluded for a specific project like the Bayano dam. Of course, the legal documents used are not exhaustive in scope and other, similar, efforts to find Hidden Stakeholders could be made. Regardless, the result in this project inspired the follow up workshops, in which potential reparations from the World Bank were discussed. It is notable that, although not done in terms of reparations, the World Bank Forest Carbon Partnership Facility has worked to identify assets and aid in the preparation of Panama for a REDD+ program (Johns, Johnson, & Greenglass, 2009).

The text of this article is the version submitted to *Challenges in Sustainability*. This has gone through peer review and the final version needs to be approved by the editor. Some changes suggested by reviewers include removing nonacademic language, making clear why the specific legal documents were chosen, and making a case that nonhuman animals as stakeholders has been discussed in the literature. For the first, examples included removing language like "commendable" and "lamentable" regarding benefits to the Indigenous communities and losses to the Indigenous communities, respectively. I also removed the mention of my own Indigenous ancestry. For the second point, the fact that availability determined which legal documents were included was added to the text. For the third, discussions of scholars who argue or highlight the arguments that individual nonhuman animals can be considered "persons" and/or stakeholders, was added (e.g. Andrews & Fenton, 2019; Ngaio J Beausoleil, 2020; Boyd, 2017; Carrie P. Freeman & Merskin, 2016; García-Rosell & Tallberg, 2021; Merskin, 2011). Also, while I am aware that having tables that do not fit in one page is not the ideal structure for McGill University standards, this was how it was submitted to the journal.

Finally, this thesis' general discussion section illustrates an "enhanced" Stakeholder Table, in which each stakeholder is given a specific relationship and some of the Relational Values demonstrated by this relationship are noted. It also has a list of common Relational Values from the literature that were considered (Table 11.1). This includes some that were not labelled explicitly as Relational Values, but can play that role. The individual who verified the original Stakeholder Table also gave their feedback, including helping attach values to specific relationships, for this "enhanced" Stakeholder Table.

#### Chapter 11 General discussion

#### 11.1 Introduction to section

This project identified several emergent themes that warrant additional discussion. While the overarching objective of the project was the application of a Relational Values lens to the discourses and interconnections present in the Bayano region, several topics of wider applicability also arose from the research. Others are strongly tied to Bayano and help further explore the region. Firstly, the theme of individual nonhuman animals as stakeholders emerged from the Human-Wildlife Conflict Impact equation workshops and the survey of documents from the Bayano region. Secondly, the concept of a Focal species for the Bayano region arose from the sources used to develop the Stakeholder Table, particularly the discussions with Embera informants as well as field notes and interviews conducted by other researchers. Thirdly, the theme of education, specifically as it connects with Human-Wildlife Conflicts also arose from the research. This was made clear in the importance placed on Education as a new Parameter in the Impact equation. Fourthly, potential ways to bridge the divide of Indigenous communities and "Western" environmentalism emerged from several aspects of this research, including the exploration of Frames in the Bayano region, along with the sources for the Stakeholder Table, including the testimonials from scholars in Guna Yala. After this, alternative methods to develop and analyze a Stakeholder Table are explored. Subsequently, emergent themes from the research that work as examples of Relational Values offering more nuanced and viable understandings than simple Intrinsic or Instrumental Value approaches, are explored. Finally, the "enhanced" Stakeholder Table, which incorporates Relational Values even more than the standard Stakeholder Table, is laid out.

#### 11.2 Individual nonhuman animals as stakeholders

One of the key themes that arose was the importance of the individual nonhuman animal. Certainly, Relational Values with individual nonhuman animals are often expressed in relationships between pet owners and their pets. These common relationships are mediated by parochialism and emotional connections (see Latombe et al., 2022). However, seeing individual nonhuman animals as stakeholders is still a minor position. Some have discussed this, including in media scenarios (Merskin, 2021).

The inclusion of individual nonhuman animals in the Stakeholder Table is based on several sources, like the 302 Bayano-related documents. This stakeholder category was kept even when the Stakeholder Table was validated by another individual familiar with documents related to the Bayano dam. When the Stakeholder Table was applied to legal documents, it demonstrates that the theme of individual nonhuman animals as stakeholders refers to a Hidden Stakeholder. Individual nonhuman animals as stakeholders was noted, in concept if not explicitly, in some of the documents linked to the Bayano region during and post-construction, particularly in those discussing the Noah 2 project. As discussed in that section of the thesis, when considering the dam construction and immediate post-construction period, discussions of the Noah 2 project were included in nearly half of the documents found. The general theme also arose in the casual conversations with the survey intermediary in the Maje Embera community, in which a small cohort of bats was discussed as important to the community (Personal communication, 2017).

Interestingly, cases like the Noah 2 project demonstrate the benefit of a Relational Values perspective. In the documents pertaining to the Noah 2 project, there was sometimes discussion of tensions between animal welfare proponents, who were rescuing the nonhuman animals, and species conservationists, who were wary that transplanting the nonhuman animals might

destabilize the ecosystem balance in certain regions (see Omang, November 05, 1976). If only an Intrinsic/Instrumental Value dichotomy were used, some of the nuance could be missed. After all, both groups give Intrinsic Value to wild nonhuman animals, but the relationships are different. One group has a strong relationship with the individual nonhuman animal, while the other has one with the species. Once this tension is brought out, the two groups could work to satisfy both their views.

Certainly, some conservation movements have already attempted to include individual nonhuman animals as key in conservation efforts. The Compassionate Conservation movement has argued that the welfare of individual nonhuman animals can be used as a template for the general protection of species (Paquet & Darimont, 2010). Key to this school of thought is the belief that the intervention of humans in the environment causes greater harm than what nonhuman animals would normally experience (Paquet & Darimont, 2010). Their guideline consists of four key aspects to nonhuman animal welfare, namely, "first, do no harm; individuals matter; inclusivity of all individuals; and peaceful coexistence between humans and animals" (Hayward et al., 2019, p. 763). Proponents see killing for conservation to be a wrong approach, since it hurts individual nonhuman animals (Hayward et al., 2019). Compassionate Conservation can be considered a Virtue Ethics approach, in comparison to a maximization approach (see Latombe et al., 2022).

The related Conservation Welfare movement has also gained some traction (Ngaio J Beausoleil et al., 2018). This is an explicitly "consequentialist perspective that considers conservation under the prism of animal welfare maximization" (Latombe et al., 2022, p. 54). Some have argued that other differences to Compassionate Conservation include that proponents accept some use of nonhuman animals by humans and do not necessarily see death as a significant harm (Ngaio J Beausoleil, 2020). Conservation Welfare tries to bring together the view of welfare in conservation, which focuses on the "fitness" of nonhuman animals, with the "feelings" focus of nonhuman animal welfare science (Ngaio J Beausoleil et al., 2018, para. 1). The former consists of measures, including potentially body conditions, that affect survival and reproductive success (Ngaio J Beausoleil et al., 2018). The latter are the indicators measuring the physical and functional states tied to the mental perspectives of a nonhuman animal (Ngaio J Beausoleil et al., 2018).

This thesis adds to these efforts, particularly by showing that many stakeholders in the biology, environmentalism and sustainability realm are open to consider nonhuman animal welfare for its own sake (Intrinsic Value), as demonstrated by the choice of "biocentric" in the workshop poll. A certain proportion of those choosing "ecocentrism" probably also agree with this sentiment. The terminology that arose in the workshops, including "sentient beings," also point to Intrinsic Value for individual nonhuman animals. The articles in this thesis also indicate the fact that this is a Hidden Stakeholder in most discussions. This should be kept in mind when trying to list or connect stakeholders for a region or project. Finally, the inclusion of nonhumans as stakeholders in the Stakeholder Table hopefully goes a long way in creating a Relational Values system that avoids being human-centric (see J. Piccolo et al., 2022).

# 11.3 Focal species in the Bayano Region: The importance of relationships

Another interesting theme arising from this thesis is the somewhat unique idea of Focal species for the Bayano region. In terms of species, Focal species are discussed by several groups, including both in the workshop and the individual surveying of the Maje Embera community. Turtles, for instance, were referred to by informants as diminishing in number (Yahya Haage, 2019a). Also, the Guna testimonials and conservationists discuss declines, both from a scientific

and spiritual approach (e.g. Ventocilla, Herrera, Nùñez, & Roeder, 1995). In Guna Yala, overlapping somewhat with the Bayano watershed, several species, such as jaguars and turtles, were discussed as rapidly vanishing (Chapin, 1995). The Indigenous communities' emotional links to species and the ecosystem were also key in some sources, such as the testimonials of Guna locals and elders (e.g. Ventocilla et al., 1995).

Interestingly, regarding Focal species in Bayano, the use of cattle for agriculture was seen as a largely non-Indigenous method of making a living (e.g. Smeaton & Rivera-Fagan, 2010). Cattle could therefore be seen as an Emblematic species, being an emblem of cultural affiliation. Certainly, cattle can be a sign of social differences (e.g. Smeaton & Rivera-Fagan, 2010). Raising cattle, even a single one, can set Campesinos and Indigenous communities apart and even cause social tension from within Indigenous groups. As discussed in the casual conversations with the Cacique (Chief) of the Maje Embera community, the Indigenous individuals in his communication, 2018). Similarly, a Maje Embera community member who was taking a survey added the comment that it "is important to return to nature, without cattle raising" (Personal communication, 2017). Interestingly, the strong use of cattle and other grazing animals was also a clear cultural distinction between the Norse and the Inuit cultures in Greenland, as discussed in the literature review (Thomas H. McGovern, 1980).

As Emblematic species for the Bayano region, cattle can be linked to environmental impacts in the area (ANAM (Ministerio del Ambiente), 2015). As such, some may consider them to be poor Focal species, since more of them would not fit with conservation efforts. However, the fact that considering them may elucidate tensions in the region makes them interesting Emblematic species to consider. This is similar to bulls used in bullfighting, which can certainly be Emblematic species for a region, but whose use may be in contrast to environmentalism. After all, in the Relational Values perspective, bullfighting may be seen as a disvalue (Lliso, Lenzi, et al., 2022). Similarly, it may be seen as intrinsically bad from an Intrinsic Values perspective (Lliso, Lenzi, et al., 2022).

Such a view of an Emblematic species is not entirely unknown in the literature. Although the term Focal species was not used, a similar case has been made regarding pigs in Buano, an island in Indonesia (Soselisa, 2007). Briefly, before a regional conflict, the feral pigs led to cooperation between Muslims, who could not handle the pigs that worked their way into their gardens, and Christians who could remove these pigs and get their meat as a reward (Soselisa, 2007). After the regional conflict, there was greater division between the religious communities and this cooperation broke down (Soselisa, 2007). Furthermore, some Christians began to farm pigs, which they had previously not done out of respect and aid to their Muslim neighbors (Soselisa, 2007). Just as with cattle in Bayano, here pigs, even domestic pigs, could be seen as Focal species and emblematic to a type of community. In the end, maintaining a broad definition of Focal species, and considering differing relationships, can be fruitful for understanding a region.

The cohorts of bats that were shown to me during my stay can be seen as Emblematic species, since the community holds them as important and their loss would be a great loss for the community (Personal communication, 2017). In fact, bats are considered emblematic for many in the region, as tours of caves and their bat colonies are common tourist attractions (Humphreys, 2010). Notably, research suggests bats are good Indicator species for Neotropical rain forests (Medellín, Equihua, & Amin, 2000). As such, both the tourism industry, which uses bats as an Ecosystem Service, and the Maje Embera community, who have a strong relationship with the

bats, could offer aid in monitoring bat decline. After all, the article on perceptions of species abundance for this thesis ("Determining the Views of the Panamanian Indigenous Maje Embera Drua on Environmental and Biodiversity Changes") demonstrates the Maje Embera community is generally aware of species decline.

## 11.4 Expansion of education and Human-Wildlife Conflicts

The workshop with the Maje Embera community brought out that education was necessary for their Good Life (Yahya Haage, 2019a). This is notable for not necessarily being a "nature-inclusive" aspect in Relational Values. Of course, it is discussed in some areas of environmentalism, like Child-Friendly schools (Iltus, 2013) and water sustainability (A. Brown & Matlock, 2011). This thesis can add to its importance, not only for children, but also the concept that adult education is necessary for the community to thrive. Being educated in the "Western" system can help Indigenous people advocate for their, and even nature's, rights.

For the HWC Impact equation, the Parameter of Ethics was often seen as vital for encouraging change. This is interesting as it is a recent addition to the equation and seldomly used. The results of the workshop suggest optimism that people's worldviews and ethical stances are malleable enough to change, presumably through education or experience.

Education was also directly key to the HWC Impact equation, for which it was, in many cases, seen as a potential new component. Education is certainly important in Human-Wildlife Conflicts. In fact, there are several levels at which education can be important for Human-Wildlife Conflicts, in both gathering and disseminating information. This includes demographic aspects, as has been discussed regarding wealth (Pearce, 2005). This would be connected to the HWC Impact equation's Affluence Parameter as well. Education could also be more expansive,

including addressing politics and governance in conservation efforts (Taljaard & Swemmer, 2011).

The HWC Impact equation developed in the 14 workshops could even be paired with previous concepts, such as Conservation Conflict Transformation (CCT) (Madden & McQuinn, 2014) and the approach to biodiversity conservation elucidated by Rands et al. (2010), to explore the different levels at which education and Human-Wildlife Conflicts intersect. The former considers three levels in a conflict: The Dispute, namely the superficial manner in which conflicts present themselves; the Underlying Issues that are involved in this conflict; and the Identity-based Level, which deals with the "values, beliefs or social-psychological needs" central to the parties (Madden & McQuinn, 2014, p. 101). The latter researchers saw three necessary tiers to biodiversity policy: The integration/dissemination of biodiversity concepts in all realms of society; the creation of "appropriate institutions, governance and behaviors" so that policy change can occur; and the actual legislation, incentives and technologies needed in the policy (Rands et al., 2010, p. 1302). As is clear, education, as was brought out in the Impact equation article, can play a paramount role in HWCs. After all, all these levels can have a strong educational component. These range from understanding stakeholders to educating policymakers.

11.5 The Indigenous Perspectives and "Western" Environmentalism

11.5.1 Bridging the Indigenous Perspectives and Standard "Western" Environmentalism

This section considers potential bridges between Indigenous needs/views and "Western" environmentalism. Several such topics arose in this thesis and its articles.

"Western" environmentalism usually refers to the field of environmentalism that arose in the West (gaining steam in the 1960s) (Dunstan, 2016). Developed in the United States and Europe, it focused on protecting the nonhuman environment and humans from habitat loss and pollution (Dunstan, 2016). There were some individuals that could be considered preenvironmentalists. For instance, there were the Hudson River School of painters, which emphasized the beauty and worth of nature (LaFreniere, 2007). John Muir would also be a key early figure, even including a rebellious spirit somewhat similar to the more modern proponents (Obernesser, 2010).

Even early on, there were influences from other cultures (White, 1967). "Western" environmentalism has certainly taken concepts from Indigenous views. For instance, some have discussed how modern neo-pagan environmental views incorporate ideas from Indigenous groups (Hay, 2002). Furthermore, this has been discussed in Relational Values literature, with concepts like the Good Life taking ideas from versions of Sumak Kawsay, although nuances in the terms can become lost (Cuestas-Caza, 2018). Some have also discussed the influences going the other way (Grim, 2001).

However, there can still be conflicts between "Western" environmentalists and Indigenous requirements. The concept of the Ecological Indian, discussed earlier in the thesis, is one such problematic perspective. It not only suggests Indigenous peoples are always in line with "Western" environmentalism, but also has the Indigenous peoples as a monolith, unchanging culture (Krech III, 2005; Rice, 2014).

For the former aspect of the Ecological Indian concept, there were cases, highlighted in this thesis, in which "Western" environmentalism and Indigenous requirements do not coincide. For instance, as discussed in the first article on Frames and seen in the documents for the Stakeholder Table, the Maje Embera community is situated in a hydrological reserve, which is making it difficult to get their land tenure recognized (Mecha, 2018). This is not a problem of a bygone era, as the Indigenous communities around the Panamanian Chan-75 hydroelectric project, completed in 2010, were told they had no claim to their ancestral lands because it was a forest preserve (see Paiement, 2007). As shown with the Identity Frame ("Frames, Omar Torrijos, and Media Documents during and after the Bayano Dam Construction Period"), there is overlap with the Conservation Frame, but this is not a given. The needs of Indigenous communities can clash with the views of the "Western" environmentalism movement, such as their needs to protect their identity and lifeways.

For the second part of the Ecological Indian, one can see that Indigenous cultures are not unchanging monoliths. As seen in the testimonials from Guna Yala, one of the sources for the Stakeholder Table, some in the younger generation were criticized for abandoning ecological lifeways (Chapin, 1995; Lopez & Nunez, 1995). In the casual conversations with the Cacique (Chief) of the Maje Embera community, the need to rediscover one's Indigenous side was seen as key (Personal communication, 2018). By using a Stakeholder Table to find Hidden Stakeholders, this thesis did show that these generational divisions are not discussed in many important documents. This is despite being considered crucial to the needs of the Indigenous peoples and the continuation of their lifeways (Chapin, 1995).

All this points to there still being a need to create a better bridge between "Western" environmentalism and the requirements of Indigenous communities. This is a massive topic, with no simple answer. However, this thesis and its approach of Relational Values can offer some ideas.

Developing a common perspective might be useful. For example, the Stakeholder Table considers both "spiritual ecosystems" and "scientific ecosystems." This is because, unlike in an Intrinsic/Instrumental Value dichotomy, it is not sufficient to state that both the Indigenous

peoples and "Western" science consider the ecosystem important. From a Relational Values perspective, the link between these groups and the concept of the ecosystem is better dissected. Such nuance could offer a way of speaking about both components. For instance, one cannot assume that all must agree or even approach a topic like preserving an aspect of the ecosystem from the same view. Exploring such views would hopefully lead to greater dialogue between groups.

This thesis also suggests language to be a potential bridge. A key component of Indigenous worldviews, as discussed in the literature review, is that culture and nature are not separate aspects (Nash, 1989). In contrast, this may be the approach in "Western" environmentalism, as has been discussed in the literature (Ingold, 2008). The aforementioned creation of a protected area that would exclude the Indigenous community is such a perspective (Mecha, 2018). Others have written much about similar cases (Dowie, 2009).

The use of language to bridge disciplinary gaps is not new, as in the bridging of feminist studies and environmentalism, specifically animal rights (see Adams, 2019; see Dunayer, 1995). As such, seeking language that can connect "Western" environmentalism and Indigenous needs is not coming out of the blue. Certainly, this thesis shows the willingness, at least in theory, for those involved in biology, environmentalism and sustainability to use language that reduces and rethinks the nature/non-nature divide, as shown by the HWC workshops. This is, of course, not a new idea in environmentalism (Bell & Russell, 2000; Fourrier, Tonnaer, & van den Born, 2022; Magee, 2012; Ogula, 2021), but these workshops certainly add to the willingness to explore this topic.

The Stakeholder Table article also sought to find synergistic ways to address Hidden Stakeholders. Ecotourism is one such example, although one must be careful to give control, including economic gains, to the local Indigenous communities. As has been discussed, ecotourism, if handled well, can be a tool to teach the younger generation about their traditions and environment (Lanteigne, 2019). Since ecotourism also has a conservation and scientific component, it could be another bridge allowing for "Western" environmentalism and Indigenous needs to thrive. Certainly, for the younger generation, it could allow them to learn more about their culture, history, and environment, which can be empowering.

11.5.2 A new paradigm in "Western" science and a potential link to Indigenous views

Perhaps as new concepts arise in "Western" science, they could potentially be linked, early on, to Indigenous perspectives. For some, this may seem unlikely due to the differences between "Western" thinking and Indigenous epistemologies. As such, an example of potential crossover will be briefly outlined here.

A new concept in "Western" research is the Holobiont, the idea that the individual is actually made up of the human and the microbiome of the human (Žukauskaitė, 2020). Several writers have already spoken about its repercussions. For instance, as discussed by Žukauskaitė (2020, p. 151), "the notion of holobiont questions the idea of a self-organized individual and indicates that all living beings are dynamic organizing processes." Scholar de Fleuriot Perry (2019, p. II) made a similar connection, with the Holobiont referring to the "messiness" of the human body and a way of countering the "capitalistic ideal of an individualized body." Relatedly, the concept of the Holobiont can help understand humanity as dependent on the rest of nature rather than an external entity (Crawford, 2022).

The link between the Holobiont and animistic worldviews has also been explored. Some have made a general connection between Indigenous views of interconnected animism with the concept of the Holobiont (Crawford, 2022). Similarly, others have seen a strong connection, conceptually, between the Holobiont and Amazonian Indigenous worldviews (Uhall, 2022). Relatedly, it has been argued that Indigenous views hold "the external world to be pluralist, polyvalent, and deeply participatory," and, as such, are complementary to the concept of the Holobiont (Wells, 2018, p. 93). Bradford (2021), in their development of a new theological perspective, also considers links between the Holobiont and Indigenous views. Vitally, some other work has been done regarding the Māori people and understandings of the microbiome, including some Indigenous scholars making a link between aspects of the microbiome and Indigenous perspectives (Warbrick, Heke, & Breed, 2023). This could be a start for the acceptance of the Holobiont, a more abstract concept. As it stands, this past work is a massive step forward.

In terms of Bayano communities specifically, an argument for a link can be made. Certainly, the communities in the region favored animism before the introduction of "Western" religion (E. Guerrero & Nùñez, 1995; Schweinsberg, 2021). Notably, documents by the Guna Yala inhabitants, whose reserve overlaps with the Bayano watershed, discuss illnesses, like smallpox and AIDS, which are said to come more frequently from the "West" (Lopez & Nunez, 1995). This suggests the idea of microbes is not foreign, which is understandable considering the substantial contact with the "West." Relatedly, Cáceres et al. (2017) explored the way malaria is perceived in Guna Madungandi, including the spiritual and cultural perspective that it is caused by angered spirits. The author also discusses the communities' animistic worldview (Cáceres et al., 2017). While the link is not made by that author, there may be a leverage point here to encourage a view of a plethora of helpful, usually unseen, microbes. Unlike the malaria parasite, these could be framed as positive. Finally, there is a micro/macro relationship between minerals, like gold, which is found in the body, being linked to the gold of the world (E. Guerrero & Nùñez, 1995). As these communities have incorporated "Western" concepts, it will be interesting to see if the Holobiont becomes a link between "Western" and Indigenous views. As I started this research, I personally hoped to find Bayano documents discussing the Holobiont, but found none. Future Stakeholder Tables may want to consider this category, if it arises in the literature.

## 11.6 Alternative methods for the Stakeholder Table

To identify Hidden Stakeholders, the Stakeholder Table was applied to legal documents. Available legal documents, spanning several decades, were consulted. However, this could be modified to only consider more recent documents or those of another specific time frame. One goal was to develop synergistic projects that target several Hidden Stakeholders. The likelihood or general acceptance of certain approaches, specifically in terms of reparations, was gauged through workshops with stakeholders. Alternative methodologies could be applied, however. One such method could use a branching tree structure, as outlined in a similar past effort in the Bayano region.

As background, the Bayano region in Panama has been used as a case study to develop the first steps towards a child-centered Water Poverty Index for the region (Yahya Haage, 2019a). While a final measure for water poverty was not calculated, each of the five component of the index (Resources, Access, Capacity, Use, and Environment) was considered with a view to creating synergistic efforts (Yahya Haage, 2019a). Key to the Water Poverty Index is that it takes an expansive view of water poverty, including physical and institutional components of water, which was considered key for the Bayano region effort (Yahya Haage, 2019a).

As an example of a potential synergistic application regarding water poverty, the creation of a school well and garden was discussed. This could encourage parents to let children attend school (as there would be a source of food and water there), lead to more environmental education as children tended to the garden, and allow greater shade and cooling for local individuals (Yahya Haage, 2019a). As discussed in the literature, working the garden could also help in peacebuilding exercises to reduce tensions within and between communities (Iltus, 2013).

A key aspect that came out of this child-centered water poverty project was the concept of a branching tree model which would help advocates map out and compare different possible strategies. Each branching spot refers to an aspect of a project. In terms of the Bayano Stakeholder Table developed in this thesis, a similar branching tree format could be applied to find synergistic projects that target as many stakeholders as possible. The branching tree should be flexible, to suit basic needs, and values can be determined based on the goals one wants to achieve.

As such, a node could ask "Was Stakeholder 'A' included in this effort?" and the possible choices would be Yes (1 point) and No (0 points). If a specific stakeholder must be included or only excluded if really necessary, giving it a higher value could make sense. Greater values could also be given if a strategy targets multiple Hidden Stakeholders. This could similarly be done if some stakeholders are considered to be "rights-holders" and/or if social equity is a vital goal, two key aspects discussed in the literature (see Field, 2019; see Sarkki, Heikkinen, & Löf, 2021). Finally, there could be a branch referring to gathering stakeholder information directly from a specific stakeholder.

The general branching tree outlined for the Bayano child-centered Water Poverty Index is placed as Figure 11.1 in this section. There are several programs, including Excel, that can help form decision trees, although it should be kept in mind, as in the child-centered model, that this a heuristic tool, not an absolute roadmap. Figure 11.1. Decision tree for determining how child-centered a project to reduce water poverty is. Used with permission from the document: *Developing a Child-Centered Water Poverty Index: General Guidelines and the Case Study of the Bayano Region, Panama (Version 1.0).* 



11.7 Themes that demonstrate the value of applying Relational Values rather than standard Intrinsic or Instrumental approaches

# 11.7.1 Introduction to section

The framework of Relational Values goes beyond instrumental or intrinsic valuations of an object, as it considers the relationships that must be maintained to thrive, which means having a life that one considers meaningful and fulfilling. In this thesis, several cases arose where Relational Values were key. In some, the benefits of a Relational Values perspective are clear, as they help bring out some of the nuances of these situations. As discussed by scholars, this does not negate Intrinsic and Instrumental Value (Mattijssen et al., 2020). However, it can add nuances that might otherwise be missing. This section will discuss a few, key examples. It is in no way an exhaustive exploration of the topic. Some case studies are straightforward, while others benefit from a deeper exploration, as is clear below.

## 11.7.2 Relational Values, Frames and how to protect lifeways

The exploration of the desires to maintain Indigenous lifeways and other social components benefit from a Relational Values perspective. Consider the example given in the article "The Environmental Stewardship Frame, the Role of History, and the Indigenous Communities of the Bayano Region in Panama," which details a Guna community that had developed a syncretic worldview (Yahya Haage, 2019b). Their relationship with their lifeways, which they saw as important to protect, was also tied to a relationship with outsiders and future material wealth (Moeller, 2006). Aiding such a group would be more effective if these relationships are well understood. This nuance would be difficult to parse out in terms of Intrinsic and Instrumental Values. Even a case of stakeholders considering Indigenous lifeways as intrinsically worth protecting may miss nuances of what that protection means to different

stakeholders. For instance, one may ask what role achieving material wealth in the short term would mean for this Guna community. Their relationships between traditional lifeways and eventual material wealth would have to be considered. As another example, one may ask to what extent protecting lifeways would include a cultural isolation for this community. The relationships between traditional lifeways and a negative perspective of outsiders would also have to be explored. Considering the relationships involved would give a better picture of the complex situation.

# 11.7.3 Spiritual and non-spiritual ecosystems

One of the themes that arose during the development of the Stakeholder Table, which used sources such as Indigenous testimonials and historical Bayano-related documents, was the necessity to include both a "spiritual ecosystem" and a "non-spiritual ecosystem." This is one of the cases where Relational Values can consider nuances in situations that might otherwise be missed through simple Intrinsic and Instrumental Values. For instance, both Indigenous scholars and "Western" environmentalists could give ecosystems and their components Intrinsic Value. Despite this, the relationships between the actors can be quite different. For some, the ecosystem is a community that the people belong to and within which there is a sense of true kinship (Chimakonam, 2017). For others, it may be a complex structure that must be maintained, primarily through not interacting with it. As such, to truly understand the stakeholders, a Relational Value perspective, focusing on the relationships, would be helpful. This topic is also discussed elsewhere in this thesis.

# 11.7.4 The Noah 2 project

In the article on Frames and media linked to the Bayano region, "Frames, Omar Torrijos, and Media Documents during and after the Bayano Dam Construction Period," one of the topics that arose from the documents was the Noah 2 project, which was an effort to save nonhuman animals that were stranded or drowning as the waters of the reservoir rose. The imperiled nonhuman animals were rescued and placed on dry land (Beynon, 1976). There was some criticism, from conservationists, that placing animals in locations where they would normally not be found could upset the balance of species in that region (see Omang, November 05, 1976). This is an example in which Relational Values can help identify nuances in scenarios that may be lost otherwise. For instance, both conservationists and the rescuers of the individual nonhuman animals consider them to have Intrinsic Value. However, the relationships are different. For one group, the relationships are with the species. For the other, the relationships are with the individual nonhuman animal. Once these relationships are made clear, there can be attempts to bridge the gap. Several potential efforts are possible, as discussed elsewhere in this thesis, and can include Compassionate Conservation and Welfare Conservation (Ngaio J Beausoleil, 2020). As mentioned, this is discussed at length in a previous section.

# 11.7.5 Focal species

Identifying Focal species can also benefit from a Relational Values perspective. As discussed elsewhere in this thesis, cattle can play the role of a Focal species. In an Intrinsic/Instrumental dichotomy, nuances in situations can be overlooked. For instance, focusing on the Instrumental Value of cattle in the Bayano region could lead to the view that it certainly does have Instrumental Value to the agriculturalist, just as crops and agroforestry are instrumentally valuable for other individuals in Bayano. One of the arguments for why Relational Values are different is that they are generally non-substitutable (Himes & Muraca, 2018). In contrast, an instrumental valuation could put fruit, cattle and cereal crops in equivalent categories. Intrinsic valuation could give cattle a greater value, depending on what feature of the nonhuman animal is considered to be intrinsically valuable. For instance, if "rarity" is the component, then cattle do not fit the bill. If the aspect is "sentience," then cattle could be considered intrinsically valuable and efforts could be made to increase their welfare. Some nuance in the scenario can still be missing, however.

Relational Values can offer such a nuance. The relationships between individuals in Bayano and cattle are quite varied and go beyond Instrumental and Intrinsic Values. For some in Bayano, cattle are a sign of cultural groups, specifically the Indigenous and non-Indigenous communities. This is expressed in past research (see Smeaton & Rivera-Fagan, 2010) and discussions with informants (Personal communication, 2018). For some, cattle raising may be substitutable, while it may not be for others. Efforts and policies to encourage or discourage cattle raising must take these social relationships into account, as simply looking at the benefits of cattle raising from an abstract position would not be sufficient. While it may be possible to develop Intrinsic or Instrumental systems that lead to similar results, socio-cultural relationships are clear and basic components of Relational Values and therefore easier to understand from that perspective. The concept of cattle as a Focal species has also been discussed in an earlier section of this thesis.

# 11.7.6 Relationships and environmental changes

One of the benefits of taking a Relational Values perspective in this research is the application of the relationship between individual Embera community members and the climate. As discussed in the article "Determining the Views of the Panamanian Indigenous Maje Embera Drua on Environmental and Biodiversity Changes," the changes in seasonality were seen as largely unpredictable (Yahya Haage & Lee, 2022).

One could attempt to take an Intrinsic or Instrumental Values approach, but they would be lacking. Between the two, the easiest approach would be an instrumental approach, with the value of the regional climate being what it offers participants, such as a reliable source of crops. However, this does not gather all the nuance, particularly excluding those that do not get something substantial, such as a quantifiable service, from the climate, but still noticed changes. A relationship of "trust" might still be felt by such individuals regarding the environment. The Relational Values perspective could explore such relationships and allow for more nuanced interactions with the climate.

As mentioned previously, one component of Relational Values is that they are generally non-substitutable (Chan et al., 2018). Some examples of substitution in regards to climate change have been made. Regarding certain areas of the United States, some claim that warmer "temperatures may extend seasons for tourism activities such as cruise ships and boating while reducing the seasons for skiing and snowmobiling" (MCC STS, 2020, p. 18). They subsequently also discuss impact on agriculture, but the substitutability in the quoted statement is clear (MCC STS, 2020).

Relational Values would reject such simplistic substitutability since a change in lifeways means a change in the relationship to a component of nature as well as a potential loss of cultural features. More pragmatically, the changes in climate, as shown by the first article, can be unpredictable, so such shifts from one industry to another may not be possible (Yahya Haage & Lee, 2022).

It should be noted that substitutability is not only discussed regarding climate. In fact, the perspective of substitutability in Instrumental Values has been explored in other environmental realms. For instance, some have pointed to attempted substitution in instrumental valuations in

conservation, which in practice can make developing conservation plans difficult (Sandler, 2012). Similarly, others have discussed the substitutability of Instrumental Values by highlighting the example of recreating a habitat for a species as a substitute for a degraded one (Grubert, 2018). This is explicitly contrasted with Intrinsic and Relational Values (Grubert, 2018). Others have used the example of trees and Instrumental Value, noting that substitutability is a component of this type of valuation (Bengston & Xu, 1995). It has even been discussed in several other fields beyond conservation and preservation. For instance, some have discussed its relevance in the field of emerging technologies (Sandler, 2016). Others have even explored substitutability in the realm of heritage and culture (Azzopardi et al., 2023). Relational Values strives to eschew substitutability in all such scenarios.

Of course, Instrumental Values can be more complex and include services such as Cultural Ecosystem Services (Millennium Ecosystem Assessment Board, 2005). Notably, some argue Cultural Ecosystem Services should be considered equivalent to Relational Values (Al-Afifi, 2018). In either case, Relational Values can still be a clear approach in understanding the relationships between a community and their environment that goes beyond services accrued. For instance, past research has discussed an example that illustrates the key nuance that can come about from different approaches (Klain, Olmsted, Chan, & Satterfield, 2017). In that example, a mother with "anthropocentric views and little understanding of consequences of a particular threat where she lives (such as climate change influencing flooding)," could still be in support of an environmental protection scheme "if doing so is consistent with notions of good parenthood or citizenship" (Klain et al., 2017, p. 15). A focus on instrumental benefits might thus not best express all the values an individual might see as important. A focus on relationships, such as stewardship and pride, would be a better approach.
In terms of Relational Values for the Bayano region, these can be seen as "comfort," even "trust," in the regular changes of the season. As discussed elsewhere in this thesis, a "spiritual" ecosystem was considered a plus in understanding how the Indigenous Bayano communities relate to their surroundings. Such emotional links to place and the environment have been discussed regarding several Indigenous communities (Bang & Marin, 2015; Cameron, 2022; Connors, 2000; M. A. J. Guerrero, 2000). In fact, rediscovering such links has been advocated for the younger Indigenous generation (Bang & Marin, 2015). Ultimately, focusing on relationships with changes in climate and the environment, which often carry an emotional component, fit well with the key subjects of this research, namely Indigenous communities in Bayano.

## 11.7.7 Bayano, illness and outsiders

Understanding the relationships between illness, Bayano, and outsiders can highlight Relational Values. In fact, this approach can elucidate several situations. Furthermore, as it can be part of a less discussed Frame of the Indigenous communities in Bayano, particularly the Guna, a deeper exploration is warranted (see Horton, 2010).

In terms of the Stakeholder Table, the inclusion of healthcare is one example of the importance of health for the region. The need for a key relationship, that of "trust" between healthcare providers and patients is important to successful interventions. Although discussing local communities in Africa, Stewart (2000) makes the relevant point that trust in those providing healthcare, including in the form of information, can be as important as the "objective" aspects of an illness or medical condition. This has been seen in work with local communities in other locations, as well (see Morrison, 2000). In terms of nonhuman animals and zoonotic diseases, efforts in other regions meant to educate local communities on disease and disease

avoidance, have been implemented (AIESEC Mauritius, 2016). This certainly has an aspect of proper relationships, even encouraging an emotional link to the nonhuman animals (AIESEC Mauritius, 2016). It has even been linked to other relationships, such as humans and the larger environment, by including environmentalism efforts (AIESEC Mauritius, 2016). These all point to the benefits of Relational Values, which are more nuanced than simply considering illness as intrinsically or instrumentally bad. Relationships are important to consider as all the views discussed, from trust to emotional links with the environment, are mediated by such relationships.

Another facet to include is that illness can be considered part of the "spiritual" ecosystems of some of the communities, as evidenced in testimonials from Guna Yala, which were used to construct the Stakeholder Table (Lopez & Nunez, 1995). This has been explored for the Guna in general (Fortis, 2010). This also fits with other work exploring Indigenous communities (Nettleton et al., 2007). A Relational Values perspective, in which relationships between humans, nonhuman animals, and illness can be explored, is key.

Digging deeper in one case could demonstrate the usefulness of Relational Values in such circumstances. One of the topics that arose in the first article on the Bayano region Frames ("The Environmental Stewardship Frame, the Role of History, and the Indigenous Communities of the Bayano Region in Panama") was the intersection of Guna, illness and outsiders (Yahya Haage, 2019b). There was a link between outsiders to the region and illnesses that affect, or were perceived to affect, the Guna community (Lopez & Nunez, 1995). Such links can be understood well with Relational Values, but are more difficult to understand with purely Intrinsic and Instrumental Values. One could argue that illness is a part of nature that is intrinsically bad, as has been argued for concepts like predation (Lliso, Lenzi, et al., 2022). This, unfortunately, omits

the interaction with outsiders. However, this interaction is what makes the situation so nuanced. After all, it is the illnesses that come from outsiders that are seen as particularly bad, not just all illnesses (Lopez & Nunez, 1995). In fact, one of the components of Relational Values, that of general non-substitutability (Chan et al., 2018), plays a role here as well, as one illness can bring with it socio-cultural aspects that another illness may not. A Relational Values approach can use illness as a focal point to understand the relationships involved in these communities.

This Bayano example had a key element of interactions with foreigners, which is common in other case studies. For instance, some have noted a Melanesian social movement in which the same illness can be cured by a traditional healer if it is contracted within the community but not if it is contracted outside the community (Steinbauer, 1979). In another example, a new Tongan children's illness was claimed to be caused by parents travelling extensively abroad and being delayed in returning (see Parsons, 1984). A similar case considered a new Tongan illness caused by difficulty adjusting to "Westernization" (see Parsons, 1984). Interestingly, cures can also play a strong role in relationships and foreign influence. For instance, as several scholars discuss, peyote has been seen as a solution for illnesses like alcoholism, with the latter being seen as largely due to foreign influence (Garrity, 2000; Urban, 2015).

More generally and metaphorically, some illnesses such as type 2 diabetes can be considered by certain Indigenous individuals as a "white man's illness" (see Gittelsohn et al., 1996, p. 378). The return to traditional diets is seen as the solution (see Gittelsohn et al., 1996). Of course, whether it should be labelled as such or not, the diets of many Indigenous individuals has changed, with potential health issues arising (Gittelsohn et al., 1996; Iwasaki, Bartlett, & O'neil, 2004). Regardless, from a Relational Values perspective, the relationship is vital and worth exploring. In the end, a Relational Values perspective can help parse and understand these relationships with illness and foreign influence.

#### 11.7.8 Human-Wildlife Conflict terminology

In one of the articles stemming from the 14 workshops ("Beyond Human-Wildlife Conflicts: Workshops sought to develop terminology to aid in human/nonhuman animal relationships"), participants were tasked with developing terminology which would diminish the "guilt" placed on nonhuman animals in Human-Wildlife Conflicts, while maintaining their agency. The results show clear relational thinking. For instance, terms that change the relationships of humans and nonhuman animals, such as "sentient beings," were suggested. Some went even further and argued that the human/nonhuman dichotomy had to be discarded and newer relationships created. As such, the results from these workshops show that developing new terminology for Human-Wildlife Conflicts takes on, and can be understood, from a Relational Values perspective. Certainly, understanding the connections of nonhuman animals and humanity has been discussed regarding Relational Values (Ruhl, 2018). Reducing the human/nonhuman dichotomy is also a goal in some Relational Values efforts (Riechers et al., 2021).

A standard Instrumental Values perspective, in which what matters is what can be received from the wildlife, might not work to understand the suggested terminology changes. Certainly, as argued in the literature review and elsewhere (see Lawrence, 2013), the characteristics of nonhuman animals, and their similarity to humans, makes a purely instrumental perspective based on nonhuman animal and human characteristics difficult to maintain. While one could tailor an intrinsic approach that necessarily rethinks terminology, this generally includes an aspect of relationships. For instance, one could argue that all beings that can suffer are morally considerable, and a reduction of suffering should be a key effort (see Singer, 2009). This would move towards putting humans on par with other sentient beings. However, it is notable that, even in such cases, the relationship between these groups is being reconfigured, which fits well with a Relational Values view. For one, empathy, which has been argued as being strongly linked to Relational Values (Hagen & Gould, 2022), usually plays a role here. Relatedly, there is a strong argument that many of the Intrinsic Values applied to nature actually overlap, in practice, with Relational Values (Weckler, 2020). Furthermore, as has been discussed, Intrinsic Values still play a role in Relational Values perspectives (Deplazes-Zemp & Chapman, 2021). In the end, a Relational Values perspective is a key way of understanding the aforementioned article and its results. This would apply equally to similar efforts by other scholars.

## 11.7.9 Historical and cultural figures

One of the themes discussed in the two papers on Frames was the use of historical or cultural figures to explore and make a case in favor of a specific position. This can be considered from a Relational Values perspective, in which the relationship between a group and their position is mediated by their views of such a figure. For instance, bringing up a cultural figure, such as Dad Ibe, can be used to encourage a positive relationship with outsider academics (Mulder & Coppolillo, 2005), while bringing up another figure, such as Jesus, can encourage a more closed off relationship with outsiders (Moeller, 2006). The relationships between a subsection of a population and such a figure must be considered to understand their positions. This nuance can be lost if a simple Instrumental or Intrinsic Values perspective is taken. For instance, one could simplistically consider that "history" is seen as intrinsically valuable to the communities, but that would be true for virtually all communities. A key aspect of Relational

Values, namely its general non-substitutability (Chan et al., 2018), is important here as well. After all, the influence of a specific figure can be so unique, it cannot be easily substituted with another figure, say from another community. Each must be understood in its own context and its specific influence. To illustrate this using an example that ties to both Bayano and beyond, how a specific community views Jesus is distinct to how another community views him, including in terms of links to environmentalism and doctrinal interpretation (see Beisner, 2007; see Haymond, 2017; see Illyn, 2009; see Moeller, 2006). This has been analogously discussed regarding friendship as a Relational Value, specifically that a current best friend cannot be substituted by another, similar human (Hagen & Gould, 2022). Clearly, to understand the nuances of the interactions of communities and specific historical or cultural figures, a Relational Values perspective is key. A version of the Relational Value of being emotionally attached to a location, a key aspect of the perspective (Lliso, Lenzi, et al., 2022), could be a vital starting point to elucidate and develop a more nuanced understanding of individual historical/cultural figures and community relationships. Certainly, the concept of Relational Values of place attachment and the tombs and mausoleums of specific figures, has been discussed in the literature (see Samakov & Berkes, 2017).

As discussed regarding several Indigenous communities, cultural or historical figures are even used to advocate for a Relational Values perspective of the world, including nature and other humans (see J. M. Morgan, 2021; see Park, 2001; see Verbos & Humphries, 2014). Certainly, in some Bayano communities, cultural figures are argued to have taught the people how to maintain relational lifeways (Moeller, 2006). As such, not only are Relational Values useful to understand the relationships of a community to a historical/cultural figure and how that mediates their relationships to other components, but the specific version of a historical/cultural figure can have advocated for a Relational Values perspective towards the world in the first place. All this highlights the usefulness of discussing Relational Values in such areas of study.

### 11.7.10 Innovative Ideas for Environmentalism initiative

While diverging somewhat from the topic, it should be mentioned that the Innovative Ideas for Environmentalism initiative, which gave rise to the article "The Environmental Stewardship Frame, the Role of History, and the Indigenous Communities of the Bayano Region in Panama," had a strong Relational Values perspective (Yahya Haage, 2019b). Specifically, participants were encouraged to pick topics for which they had a sense of curiosity or similar emotion. This relationship of curiosity was meant to make a distinction from the more instrumental topic choices made elsewhere in academia, where pleasing a professor, supervisor or academic publisher can be the key motivator. The hope was that, by encouraging this relationship between writer and topic, meaningful papers would be developed. The fact that participants were willing to take part in the initiative despite their full academic work, as well as comments made after the initiative (Personal communication, 2019), suggest the experience was engaging.

#### 11.8 The "enhanced" Stakeholder Table and specific Relational Values

In the final article ("Creating a Stakeholder Table, Identifying Hidden Stakeholders, Exploring Relational Interventions and Potential Reparations, for the Bayano Region of Panama"), a Stakeholder Table was developed and analyzed. Specifically, the table was applied to legal documents to find Hidden Stakeholders and develop synergistic projects to enhance the region. While it could not be included in the article due to space, the Stakeholder Table can also have a greater focus on Relational Values. Certainly, as discussed in the article, the positions of the stakeholders can be seen as a component of their Good Life. However, a deeper dive can be included. Specifically, this is done by making some of the relationships explicit and linking those to common Relational Values.

The Relational Values considered come from several key sources. These include two seminal works on Relational Values (Chan et al., 2016; dos Santos & Gould, 2018). Furthermore, as agriculture is a key aspect of the Bayano region, the Relational Values elucidated in Chapman, Satterfield, and Chan (2019), which revolve around farming, are included. As the Stakeholder Table was being developed, the inclusion of other ways of making a living became a necessity. As such, these Relational Values can be expanded to consider other livelihoods. Furthermore, as some of the stakeholders are not, or at least less, nature-inclusive, it became important to include other Relational Values beyond those directly tied to nature. As such, the work of Gibson-Graham (2014), in which the author discusses values in the economic realm, were included. The author included both values in standard economic discourse, as well as "nonmainstream" versions (Gibson-Graham, 2014, p. S151). Another source linked to business is a paper on the "ethics of care," which also fits well with Relational Values (Dion, 2017, p. 135). From the examples in these works, those that fit with the Bayano region were chosen. Transforming these into the language of Relational Values was straightforward, as they already dealt with relationships. In terms of being nature-inclusive, it should be noted, as discussed elsewhere, that standard economic concepts, like self-interest and efficiency, are seen by some as based on nature, although it is in fact a version of nature that is somewhat false (Yahya Haage, 2018).

Table 11.1 lists the Relational Values considered and Tables 11.2-11.8 displays the "enhanced" Stakeholder Table. While not all Relational Values for each stakeholder could be included, those selected were felt to be of large importance in the individual cases. As with the

original Stakeholder Table, an inter-coder familiar with documents from the Bayano region offered what they thought were two key values for each relationship. This feedback was incorporated in the "enhanced" Stakeholder Table.

Both the standard and "enhanced" Stakeholder Table included the nonhuman as stakeholders. This included individual nonhuman animals and "scientific ecosystems." This was meant to work against the Good Life being too human-centric. The "enhanced" version also attempted to make the "Positions/Views" more nonhuman-centric.

What it generally means for an individual nonhuman animal to thrive, essentially their Good Life, has been widely discussed, both in the field of conservation (e.g. Ngaio J Beausoleil, 2020) and the, often related, realm of animal rights (e.g. Singer, 2009). There have also been several attempts to elucidate what it means for other aspects of the nonhuman, such as ecosystems, to "thrive." Notably, the modern exploration of what a Good Life would mean to natural features has been related to the effort to recognize legal personhood for such features (Boyd, 2017; International Rights of Nature Tribunal, 2015). One approach to including the "thriving" of nature has been to task a person or group to speak for nature, sometimes called the "Earth Defender" (International Rights of Nature Tribunal, 2015, p. 2). Thriving, and thus a Good Life, is often expressed as the ecosystem continuing to function without impact from outsiders (Boyd, 2017; International Rights of Nature Tribunal, 2015). Emotional language has been used to put people in the position of truly feeling what it means for a nonhuman natural feature, like a forest, to thrive (Wohlleben, 2016). In the end, the Good Life for the nonhuman can be, somewhat, understood, and thus incorporated in decisions regarding stakeholders.

Table 11.1 Categories of Relational Values (labeled as "Satisfaction," although other terminology is possible.)				
Livelihood heritage	Satisfaction of doing what is involved in a livelihood			
Continuity of livelihood	Satisfaction is seeking that the livelihood remains and thrives			
Livelihood for family and kids	Satisfaction of the livelihood being there for next generation			
Keeping the livelihood in the family	Satisfaction of maintaining a livelihood for next generation			
History of the land	Satisfaction of interacting with history of land			
Land for community	Satisfaction of community working together/in same activities			
Leaving a legacy	Satisfaction in maintaining the legacy for future generations			
Spiritual connection	Satisfaction in spiritual and emotional connection to the land			
Responsibility to land, water, and	Satisfaction if fulfilling responsibility to maintain ecosystem and components of			
animals	ecosystem			
Harmony with nature	Satisfaction in striving to live in harmony with nature			
Neat and tidy aesthetic	Satisfaction of keeping neat and tidy environment			
Active land management	Satisfaction of actively nurturing and maintaining the land			
Application of parcel specific knowledg	Satisfaction of applying local knowledge			
Community agency over landscape	Satisfaction of having input in local livelihood/landscape			
Applying knowledge of community	Satisfication in knowing and applying community knowledge			
Cultural identity	Satisfaction of knowing/believing nature helps create identity of a group			
Social cohesion	Satisfaction of nature helping create a connection of people to other people			
Social responsibility	Satisfaction of nature helping in the welfare of people			
Stewardship	Satisfaction of maintaining and helping nature to thrive, as it is the right position			
	to take			
Connectedness	Satisfaction of being connected and/or a component of nature			
Care	Satisfaction of positive feelings that nature is important to people			
Community	Satisfaction that nature helps define and maintain the social links of a group and			
	group cohesion			
Identity	Satisfaction that nature helps form an individual's identity			
Kinship	Satisfaction that parts of nature are part of your community or "kin"			
Responsibility	Satisfaction in achieving responsibility towards nature and ecosystems			
Individual self-interest	Satisfaction in achieving individual desires			
Competition	Satisfaction in maintaining a livelihood as competitive			
Efficiency	Satisfaction in efficiency in a livelihood			
Freedom	Satisfaction of having free choices in livelihood			
Innovative entrepreneurship	Satisfaction in ecouraging innovation and entrepreneurship			
Exploitation	Satisfaction in encouraging correct use of resources			
Pursuit of private gain	Satisfaction in pursuing private gain			
Trust	Satisfaction in having trust for someone or something			
Safety	Satisfaction in caring or being cared for			
Sharing	Satisfaction in sharing with others			
Reciprocity	Satisfaction in being in a mutual relationship			
Cooperation	Satisfaction in cooperating with others			
Future orientation	Satisfaction in looking to the future			
Thrift	Satisfaction in being thrify and not overusing			
Equity	Satisfaction in maintaining and striving for equitable world			
Solidarity	Satisfaction in maintaining and working for solidarity			
Distributive justice	Satisfaction in maintaining distributive justice			
Social justice	Satisfaction in maintaining social justice			
Loyalty	Satisfaction of having loyalty towards an organization			
Devotion	Satisfaction of having generosity and self-sacrifice for an organization			
Respect	Satisfaction of feeling respect for others			
Prudence	Satisfaction in considering impacts and effects on the organization			
Tolerance	Satisfaction in displaying tolerance for differences between segments of the Other			
Categories based on four sources (Chan	et al., 2016; dos Santos & Gould, 2018; Gibson-Graham, 2014; Dion, 2017)			

 Table 11.2 The "Enhanced" Bayano Region Stakeholder Table for the Guna Communities

Communit	.105			
	Stakeholder Category	Positions/Views	Example of relationship involved	Example of Relational Values (RV) involved (no specific order)
Guna	Guna generally	Getting their land and rights recognized	Guna to Indigenous life ways	RV between Guna and Indigenous life way: (1) Continuity of livelihood (2) Applying knowledge of community (3) Social cohesion
	Guna collective organizations	Working for Guna groups throughout Panama	Relationship between Guna and other Indigenous	<ul><li>(1) Social cohesion</li><li>(2) Community</li></ul>
	Guna younger generation	More acceptance of outside overharvesting methods and agriculture	Relationship between Guna and modernity	RV between Guna and modernity: (1) Future orientation (2) Innovative Entrepreneurship.
	Guna older generation	Maintain older harvesting and growing methods	Relationship between Guna and modernity	RV between Guna and modernity: (1) Leaving a legacy (2) Social cohesion
	Guna Madungandi	Maintain their independence, get protection from invaders, maintain the reserve	Relationship between Guna and land, (notable as it is a reserve)	RV between Guna and the land: (1) Stewardship (2) Harmony with nature (3) Responsibility to land, water, and animals
	Guna cattle raising and deforestation	Indigenous moving away from traditional subsistence methods (can be more common in younger generation)	Relationship between Guna and modernity	<ul><li>(1) Future orientation</li><li>(2) Innovative</li><li>entrepreneurship.</li></ul>
	Guna displaced	Get their land protected from invaders	Relationship between Guna and land	RV between Guna and land: (1) Active land management. (2) Responsibility

Table 1 Comm	Table 11.3 The "Enhanced" Bayano Region Stakeholder Table for the Embera         Communities					
	Stakeholder Category	Positions/Views	Example of relationship involved	Example of Relational Value (RV) involved (no specific order)		
Embera	Embera generally	Get land tenure and culture rights recognized	Relationship between Embera and life ways	Relationship between Embera and life ways: (1) Continuity of livelihood. (2) Applying knowledge of community		
	Piriati and Ipeti Embera	Get more expansive official rights to their land and get invaders resettled	Relationships between Embera and land (as they are collective lands)	RV between Embera and land: (1) Active land management (2) Stewardship (3) Responsibility to land, water, and animals		
	Other Bayano Embera e.g. Maje Embera	Get their land rights recognized	Relationship between Embera and life ways	RV between Embera and Indigenous life way: (1) Continuity of livelihood. (2) Applying knowledge of community. (3) Social cohesion		
	Embera younger generation	Greater acceptance of overharvesting methods and modern agriculture	Relationship between Embera and modernity	RV between Embera and modernity: (1) innovative entrepreneurship (2) Future orientation		
	Embera older generation	Maintain older harvesting and growing methods	Relationship between Embera and modernity	RV between Embera and modernity: (1) Leaving a legacy (2) Social cohesion		
	Embera in eastern Panama (Comarcas)	Protect their Comarcas in the east of Panama	Relationship between Embera and land (as they are reserves)	RV between Embera and land: (1) Active land management (2) Stewardship (3) Responsibility to land, water, and animals		
	Embera collective Bayano organizations	Working with other groups to achieve their land tenure and culture protection goals	Relationship between Embera and Indigenous rights	RV between Embera and Indigenous rights: (1) Responsibility (2) Social justice.		
	Embera displaced (collective lands and unrecognized lands)	Get land tenure recognized and protected	Relationship between Guna and land	RV between Guna and land: (1) Active land management. (2) Responsibility		
	Indigenous raising cattle and deforestation	Indigenous moving away from traditional subsistence methods (can be more common in younger generation)	Relationship between Embera and modernity	RV between Embera and modernity: (1) innovative entrepreneurship (2) Future orientation		

Panamanian Groups					
	Stakeholder Category	Positions/Views	Example of relationship involved	Example of Relational Value (RV) involved (no specific order)	
Other Panamanian communities	Other Panamanians in the west of the nation, including Zonians	Maintaining their rights and connections to other countries	Relationship between Panamanians and other countries	<ul><li>(1) Cooperation</li><li>(2) Future</li><li>orientation</li></ul>	
	Campesinos	Getting their land tenure recognized for where they settled	Relationship between Campesinos and government (e.g. feeling of mutual responsibility)	<ul><li>(1) Reciprocity</li><li>(2) Innovative</li><li>entrepreneurship</li></ul>	
	Religious groups	Offering spiritual care and living a spiritual life	Relationship of human to the divine (e.g. feeling of devotion)	(1) Devotion (2) Spiritual connection	

# Table 11.4 The "Enhanced" Bayano Region Stakeholder Table for Other

Table 11.5 The "Enhanced" Bayano Region Stakeholder Table for Corporations					
	Stakeholder Category	Positions/Views	Example of relationship involved	Example of Relational Value (RV) involved (no specific order)	
	Large cattle raising	Making a viable business through cattle raising	Relationship of worker to cattle raising industry	(1) Individual self- interest (2) Pursuit of private gain (3) Efficiency	
	Financial firms/money lenders	Making worthwhile investments	Relationship of worker to the market place	(1) Individual self- interest (2) Pursuit of private gain	
Corporations	Hydroelectric firms	Function effectively in offering electricity to parts of Panama	Relationship of firm to landscape	<ul><li>(1) Active land management (2)</li><li>Exploitation (3)</li><li>Efficiency</li></ul>	
	Other energy firms	Function effectively in offering electricity to parts of Panama	Relationship of firm to clients	(1) Efficiency (2) Responsibility	
	Construction firms	Making money in construction, hopefully an expansion of construction projects	Relationship of firm to land	<ol> <li>(1) Pursuit of private gain (2) Exploitation</li> <li>(3) Efficiency</li> </ol>	
	Tourism by Indigenous communities	Making money for the community and perhaps maintain their culture	Relationships of tourist guides to Indigenous land	<ol> <li>(1) Innovative entrepreneurship (2) Future orientation</li> <li>(3) Social cohesion</li> </ol>	
	Tourism by outsiders	Making money through tourisms, perhaps use it for conservation	Relationship of tourist guides to land	(1) Innovative entrepreneurship (2) Future orientation	
	Fisheries	Making a profit through fishing, including in the Bayano lake (mostly for tilapia)	Relationship of fisherman to industry	<ol> <li>(1) Pursuit of private gain (2) Exploitation</li> <li>(3) Efficiency</li> </ol>	
	Lumber companies	Making money through tree felling	Relationship of individual tree feller to industry	<ul><li>(1) Individual self- interest (2)</li><li>Exploitation (3)</li><li>efficiency</li></ul>	

Table 11.6 The "Enhanced" Bayano Region Stakeholder Table for Government         Entities				
	Stakeholder Category	Positions/Views	Example of relationship involved	Example of Relational Values (RV) involved (no specific order)
Government	Panamanian government generally	Maintaining advances in development while not causing issues with citizen groups	Relationship between government and national development	(1) Future orientation (2) Community agency over landscape
	Government officials	Representing the government and being a go between with local groups	Relationship between government and local groups	(1) Reciprocity (2) Cooperation
	Health system (available hospitals)	Offering health care to communities	Relationship between health system and communities	(1) Safety (2) Trust
	Education system	Offering quality education to communities	Relationship between schools and students	(1) Trust (2) Future orientation
	Other nations	Interest in the development of Panama, especially the Trans-Atlantic highway and the Panama Canal Zone	Relationship between national funders and Panamanian projects	<ul><li>(1) Competition (2)</li><li>Pursuit of private gain (3) future orientation</li></ul>
	Emergency services	Offering aid when emergencies occur	Relationship between emergency services and individuals	(1) Safety (2) Trust
	Bayano corporation/AES	Tasked with developing the region and making it profitable	Relationship of planners and Bayano region	(1) Future orientation (2) Innovative entrepreneurship

Table 11.7 The "Enhanced" Bayano Region Stakeholder Table for Science and Nature-linked Groups				
	Stakeholder Category	Positions/Views	Example of relationship involved	Example of Relational Values (RV) involved (no specific order)
	Species welfare groups/ Sierra Club/conservation groups	Protecting species and the environment	Relationship of human and endangered species	(1) Responsibility to land, water, and animals (2) Harmony with nature
	Epidemiologists	Understanding and preventing disease in the region	Relationship of doctor and patient receiving care	(1) Safety (2) Trust
Science and nature	Ecologists/biologists	Understanding and protecting the ecosystems in the region	Relationship of scientist and nature	(1) Responsibility to land, water, and animals (2) Harmony with nature
	Anthropologists	Understanding the customs, life-ways and needs of the community	Relationship of human to culture (e.g. feeling of attachment to rituals/place)	(1) Cultural identity (2) Social cohesion
	Other scientists	Playing diverse roles, Working towards greater knowledge	Relationship of scientist and area of study (e.g. feeling of curiosity)	(1) Identity (2) Responsibility
	The ecosystem (spiritual)	A complex spiritual community seeking to continue unimpeded	Relationship of human to spiritual ecosystem (e.g. feeling of community)	(1) Community (2) Spiritual connection (3) Social cohesion
	The ecosystem (scientific)	A complex natural system that deserves to continue without imposition	Relationship of conservation scientist and ecosystem (e.g. feeling of curiosity)	(1) Responsibility to land, water, and animals (2) Harmony with nature (3) Connectedness
	Individual nonhuman animals	Sentient beings deserving a reduction of suffering	Relationship of scientist to individual nonhuman animal and vice versa	(1) Kinship (2) Connectedness
	Individual species	Entities deserving to continue without imposition	Relationship of biologist to a species	<ol> <li>(1) Responsibility to land, water, and animals (2)</li> <li>Kinship (3) Connectedness</li> </ol>
	Land and nature	Components of secular and spiritual importance worth protecting	Relationship of human and land	<ol> <li>Responsibility to land, water, and animals (2)</li> <li>Spiritual connection (3)</li> <li>Connectedness</li> </ol>

Table 11.8 The "Enhanced" Bayano Region Stakeholder Table for Legal Entities					
	Stakeholder Category	Positions/Views	Example of relationship involved	Example of Relational Values (RV) involved (no specific order)	
Courts	National	Resolving national legal disputes	Relationship of client and legal system	(1) Trust (2) Loyalty	
	International	Advocating and declaring when internationally recognized rights have been violated	Relationship between communities and international tribunals	(1) Trust (2) Cooperation	
Law organizations	National	Determining the rights of Panamanians	Relationship between communities and legal system	<ul><li>(1) Reciprocity</li><li>(2) Trust</li></ul>	
	International	Determining the rights from an international standing	Relationship of human rights courts and impacted communities (e.g. developing nation communities)	(1) Trust (2) Cooperation	
	Lawyers	Working to uphold the law	Relationship of lawyer to client	(1) Trust (2) Pursuit of private gain	
Other forms of law	Customary laws	Protecting the life-ways of the Indigenous groups	Relationships between Indigenous people and their laws/rituals	<ul> <li>(1) Applying knowledge of community (2)</li> <li>Spiritual connection (3)</li> <li>Social Cohesion</li> </ul>	

#### Chapter 12 Conclusion, summary and future research

12.1 Achieved objectives and future research stemming from them

Several avenues for future research arise from this thesis, some of which will be discussed here. Using the Stakeholder Table in this document as a template, Stakeholder Tables in other regions can be developed. For instance, while a stakeholder list has been done for the Panamanian Chan-75 hydroelectric project (Barber, 2008), no Stakeholder Table or search for Hidden Stakeholders has been developed. Doing so for this region would be interesting, for its own sake but also for comparison with the Bayano results. Applications in other locations and for other types of projects would help broaden the field. Also, while a specific method for finding Hidden Stakeholders was used here, others could certainly be developed that fit for another specific site. Furthermore, groups could be divided into "rights-holders" and "stakeholders," with the former including Indigenous communities, particularly in view of treaties and accords (see Field, 2019; see Sarkki et al., 2021).

Further research should survey more Indigenous communities to understand how they view the changes in their climate. The "unpredictability" of noticed changes (Yahya Haage & Lee, 2022) should be further tested, to see whether this is common in more Indigenous communities. As mentioned in the article, it has been noted in several past studies (Fagariba et al., 2018; Kerr et al., 2018; Mutunga et al., 2017). Such information could be a benefit when helping the communities to better deal with the changes in climate. For instance, if the change was viewed by the community as a clearly defined shift, it may be easier to cope with than unpredictable change. Emergency services may be more necessary when locals experience the climate as unpredictable.

In terms of language and terminology, there was a proportion of workshop participants who were in favor of language that puts humans and nonhuman animals on a more equal footing, such as with the use of the term "sentient beings." While this was in the perspective of Human-Wildlife Conflicts, it can be more widely considered. Future avenues of research could look at how common such views are in other areas or with other stakeholders, and determine what these views may mean concretely.

The Ecosystem Services water filtration workshop activity suggested that individuals generally consider many categories of Ecosystem Services, including Consumptive and Non-Consumptive ones. Future research could add on to this, particularly by considering biocentrism and ecocentrism. After all, participants may focus more on Cultural Values, which are adjacent to Relational Values, if they can go beyond anthropocentrism. Also, as the results in this thesis were based on facilitated discussions, it would be interesting to consider what individuals would come up with on their own. Potentially, without the feedback and brainstorming of others, only some services may be considered. For instance, in a study similar to mine, some have held sessions in which individuals list Ecosystem Services and then have group discussions to develop a consensus list of Ecosystem Services (López-Marrero & Hermansen-Báez, 2011). While such a process was not possible in this thesis due to time limitations, this method could be applied to future research. Notably, in this thesis' article, the key was to have individuals take an anthropocentric perspective, not explicitly an Ecosystem Services view. The procedure could also be made less restrictive, as in the work of Marquina et al. (2022), which led participants to identify many values, including Ecosystem Services and Relational Values. Interestingly, in the study by López-Marrero and Hermansen-Báez (2011), certain stakeholders, including scientists and forest managers, came up with some Ecosystem Services that others did not, pointing to the

fact that results vary depending on the types of stakeholders under consideration. Thus, the types of stakeholders involved is key. In the workshops for this thesis, stakeholders were from the realm of biology, environmentalism, and sustainability. As they may not be the stakeholders making the final decisions in society, their results could be compared with those of others, like politicians and policy makers.

Future research should refine and apply a Human-Wildlife Conflict Impact equation to judge its usefulness to specific scenarios. The inclusion of Ethics and Education should be considered in future endeavors. Furthermore, creating a more quantitative and even predictive model would be a good inclusion in the field.

This thesis made much use of the concept of Frames and their cooccurrence. Future research should pick up on that and determine whether Frames cooccur in other types of documents and study sites. In particular, the cooccurrence of the Stewardship Frame and the Conservation Frame should be studied to better understand "Western" environmentalism and Indigenous views.

### 12.2 Planned objectives that needed modification

Beyond the potential future research outlined in this section, it is important to note that several efforts during this research project were cut short. This was primarily due to the Covid-19 pandemic, which struck during this project. One key aspect that had to be set aside was my plan to run more surveys and workshops with the Maje Embera and other Bayano communities. I hoped that longer stays with the community would lead to greater trust, so that the methodology could be more in depth. For instance, for the workshop I did run with the Maje Embera community, I tried to diminish my influence as facilitator and to not impose on the community through recording or copious notetaking. To supplement this method, the section on the workshop includes some quotes by Bayano Indigenous informants from other sources. This was included to give a fuller view of the communities and their positions.

Another effort of note is the 14 Human-Wildlife Conflict workshops that led to two articles for the thesis. Originally, these were meant to be the start of a series of workshops, leading to several activities tied directly to the Bayano region and its Stakeholder Table. The hydrological development project Ecosystem Services activity, as well as the workshops on reparations for the Bayano region are examples of components that are tied directly to the Bayano region.

Furthermore, these Human-Wildlife Conflict workshops did aid in discovering stakeholders for the Stakeholder Table, along with insights on Focal species and potential Bayano-region applications of an HWC Impact equation. Also, their inclusion is key as one of the objectives of the thesis is to include nonhuman animals in this project.

Another planned component was the comparison of the Bayano Stakeholder Table to other regions. In order to achieve this, workshops were organized with individuals affected by the Brazilian Belo Monte dam. While an initial meeting took place, this aspect of the research was not able to be completed.

## 12.3 Conclusion

In conclusion, many of the objectives of this research were achieved and brought out interesting results. Gathering survey information from the Maje Embera community is an objective that was achieved, as was the workshop run in that community. While future surveys and workshops with this and other Bayano communities was not feasible, what was achieved gave some voice to that community. Furthermore, the survey and workshop results showed the changes in climate and biodiversity they had noticed, as well as what they felt their community needs to thrive, akin to Relational Values' Good Life. In terms of changes they had noticed, most saw the climate changes as "unpredictable" and saw changes in animal abundances for all the types put forward to them (Yahya Haage & Lee, 2022). They also made a strong link between the quality of the water and social issues. As such, these objectives were achieved.

In terms of the shift from relationships to Frames (which can be made up of multiple relationships), this was also fruitful. By applying Frames, such as Conservation and Stewardship, to the Bayano region, I was able to explore both cases where the needs of the Indigenous communities coincide with "Western" environmentalism and cases where they do not. This is key to understanding the dynamics of both "Western" environmentalists and Indigenous communities.

The workshops with relevant stakeholders involved in biology, environmentalism and sustainability were largely a success. The 147 participants offered changes in terminology to remove guilt placed on wildlife while maintaining its agency. This was a success, with several terms and perspectives applicable to everyday efforts, both linguistically and emotionally. An example of the latter would be changing one's perspective on human-wildlife interactions. Also, through the workshops, a Human-Wildlife Conflict Impact equation was developed. This brought out the importance of Ethics and, potentially, Education, as a Parameter.

The articles culminated in the Stakeholder Table and the objectives for this were also achieved. By using multiple sources, including the survey, workshops, and casual discussions with the Maje Embera informants, a comprehensive Stakeholder Table was developed. The inclusion of nonhuman stakeholders was also a key addition. The Stakeholder Table was also successfully applied to legal documents to find Hidden Stakeholders. Finally, the objective of putting forth synergistic projects that can target many stakeholders was also accomplished. The discussion of reparations was also a successful objective, as it brought out what the workshop participants felt made sense for stakeholders, like international funders, to repay to communities. Notably, the options came partly from work with the Indigenous community.

Identifying a Focal species for the region was also achieved, with both cattle and bats as potential examples. Notably, by considering a Relational Values perspective, the Emblematic species of cattle can play a role in dividing different cultural groups.

Although much research still needs to be done in the areas explored by this thesis, the work done here will give new avenues and paths in this exploration. This is particularly key for those who wish to take a Relational Values or Frames perspective. Hopefully, the work herein will encourage others to build on it in their own work.

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Appendix 1 Ecosystem Services and water development

## <u>Abstract</u>

This activity, not included in the article on Human-Wildlife Conflict terminology, was an exploration of which Ecosystem Services participants found necessary to include in a water development scenario. Participants involved in biology/environmentalism/sustainability took part in a workshop (10 workshops and 101 participants in total) in which they discussed the uses of a watershed, from an anthropocentric perspective. The water filtration properties of a watershed worked as an example. The discussion results were categorized into types of Ecosystem Services, to determine which types were more common. The first section of this article focuses on Use Values. Based on past research and as a way to gauge connections to Relational Values, the Non-Consumptive Uses category was seen as key. As such, for this division of Ecosystem Services, the hypothesis was that there would be significantly more examples in the Non-Consumptive Uses (Cultural Services), than other categories. The null hypothesis was that there is no significant difference. The second section focuses on Non-Use Values, which can be divided into Existence Values, Option Values, and Bequest Values. Once again using Relational Values as the touchstone, the hypothesis was that, for the Non-Use Values, Bequest Values would be significantly most common than the other categories. The null hypothesis was that there are no significant differences between categories. Content analysis was used to identify Ecosystem Services from the discussions in the workshops. Analysis was done with a Fisher's exact goodness of fit, as well as Cochran's Q test. In both cases, the analysis showed that the null hypotheses could not be rejected for either Use or Non-Use Ecosystem Services. Results suggest there is a general evenness in the types of Ecosystem Services discussed by the workshop participants.

#### **Introduction**

This activity, not included in the article on Human-Wildlife Conflict terminology, was an exploration of which Ecosystem Services participants found necessary to include in a water development scenario. Participants involved in biology/environmentalism/sustainability took part in a workshop (10 workshops and 101 participants in total) in which they discussed the uses of a watershed, from an anthropocentric perspective. The results were categorized into types of Ecosystem Services, to determine which types were more common.

Ecosystem Services can fit into Use Values and Non-Use Values (Value of Nature to Canadians Study Taskforce, 2017). An understanding of Use Value is key. This includes both Consumptive and Non-Consumptive Uses (Charles & Dukes, 2008; Value of Nature to Canadians Study Taskforce, 2017). The former are cases where the Ecosystem Services are used up by humans, such as the consumption of fish (Charles & Dukes, 2008; Value of Nature to Canadians Study Taskforce, 2017). Many Provisioning Services fit in this category (Charles & Dukes, 2008). The latter category are uses that do not consume nature, such as tourism and spiritual connections to nature (Charles & Dukes, 2008; Value of Nature to Canadians Study Taskforce, 2017). Many Cultural Services fit in this category (Charles & Dukes, 2008). The next category of Use Value are the Indirect Use Values, which fit with Regulating and Supporting Services, such as nutrient cycling (Charles & Dukes, 2008).

Notably, arguments have been made that the Cultural Services category fits closest to Relational Values (Al-Afifi, 2018). Certainly, relationships are key to human's interactions with nature. There is also past evidence that Cultural Services are quite commonly discussed. For instance, one study performed content analysis on documents from American environmentalist organizations that deal, in some way, with the urban environment (Ibes, 2011). Cultural Services was the most commonly discussed group (Ibes, 2011). Similarly, in one study, non-farmers in mountain ranges in Spain were found to emphasize Cultural Services. Farmers, however, emphasized others, including Regulating Services (Bernués, Tello-García, Rodríguez-Ortega, Ripoll-Bosch, & Casasús, 2016). One study of note, using content analysis, considered Ecosystem Service in comprehensive plans in one municipality in Sweden spanning several decades (Schubert et al., 2018). The study found that Provisioning Services were most discussed, followed by Cultural Services (Schubert et al., 2018). Another study, using content analysis for documents discussing European peri-urban regions, found that Cultural Services were mentioned most often, followed by Regulating Services (Vindigni, Mosca, Bartoloni, & Spina, 2021). Another study considered official land use plans in Ontario municipalities and found Cultural Ecosystem Services were most commonly discussed (Lam & Conway, 2018). Finally, in a comprehensive review of conservation assessments, researchers found that Cultural Services were the most discussed type of Ecosystem Service (Egoh et al., 2007). This past research suggests Cultural Services are a quite important category.

As such, for this division of Ecosystem Services, one could hypothesize that there will be significantly more examples in the Non-Consumptive Uses (Cultural Services). The null hypothesis is that there is no significant difference.

The other Ecosystem Services category are Non-Use Values, which also encompass some Provisioning, Cultural, Regulating and Supporting Services (Charles & Dukes, 2008). Non-Use Values can be divided into Existence Values, Option Values, and Bequest Values (Charles & Dukes, 2008). Existence Values occur when one has a good feeling that an aspect of nature exists, even if it is never enjoyed directly by the person making the valuation (Charles & Dukes, 2008; Raymond et al., 2009). Option Value refers to maintaining the option that the aspect of nature can be used or enjoyed at some future time (Charles & Dukes, 2008; Gómez-Baggethun, Barton, Berry, Dunford, & Harrison, 2016). An example is maintaining a jungle because of the future discoveries that could come from it (Gómez-Baggethun et al., 2016).

Bequest Value refers to protecting an aspect of the environment so that it is available for future generations (Charles & Dukes, 2008; Gómez-Baggethun et al., 2016). There is some research suggesting that Bequest Values are seen as important, such as in Indigenous communities (Oleson et al., 2015). Similarly, research has shown that a top reason given for protecting traditional fishing grounds is based on Bequest Value (O'Garra, 2012). Other research has argued that certain subcommunities, such as retired individuals, are willing to give more importance to Bequest Values than other groups (Walsh, Loomis, & Gillman, 1984). Bequest Values also play a key role in the general field of sustainability, where there can be a discussion of Weak and Strong Sustainability regarding what societies owe future generations (Ayres, Van den Berrgh, & Gowdy, 2001; Pearce & Atkinson, 1998).

Bequest Values fit with a relationship with future generations, and can thus fall under the Relational Values umbrella. As such, if Relational Values are pervasive, one can hypothesize that, for the Non-Use Values, Bequest Values should be significantly most common than the other categories. The null hypothesis is that there are no significant differences between categories.

#### Materials and Methods

In 10 workshops (101 participants in total) with individuals involved with biology and/or environmentalism and/or sustainability, participants were given a scenario and had to discuss the benefits that could come from a watershed. The focus was on anthropocentrism.

The scenario was adapted from one by McCauley (2006). In it, a watershed that works to filter water is put forward. If maintaining the watershed is less expensive than building a water filtration system, its protection is easy to argue for. However, it may be possible that building a water filtration system is much cheaper than protecting the watershed. Participants were then asked to justify protecting the watershed, using an anthropocentric perspective. They were not told, however, to look for Ecosystem Services explicitly. See the main thesis for more information about the workshops.

### Data analysis

Notetakers in each workshop wrote down the suggested uses put forward by the group. Using content analysis (Vaismoradi, Turunen, & Bondas, 2013) based on the categories of Ecosystem Services discussed above, the prevalence of each type of service was noted. For simplicity, a category is or is not mentioned (0/1). The categories were compared using Fisher's exact goodness of fit analysis in R studios (McDonald, 2014) to see if there is a category that stands out as being discussed more. A benefit of the Fisher's exact goodness of fit test is that it can accommodate low numbers of datapoints. Since a group could discuss more than one Ecosystem Service, Cochran's Q test (NCSS, 2014; West et al., 2010) (R studios) was also conducted to find if there were differences between categories.

#### **Results**

For the first type of Ecosystem Services (Use Values), there were 13 examples, spread out relatively evenly in terms of Consumptive Use (3 examples), Non-Consumptive Use (4 examples) and Indirect Use values (6 examples). The Cochran's Q statistic was 2 (p>0.05). The Fisher's exact test goodness of fit had a p-value greater than 0.05. Thus, no significant difference was detected. As such, the null hypothesis cannot be rejected. For the second type of Ecosystem Services (Non-Use Values), there were 11 examples, once again spread out evenly in terms of Bequest (3 examples), Option (4 examples) and Existence Values (4 examples). The Cochran's Q statistic was 0.25 (p>0.05). The Exact test goodness of fit had a p-value greater than 0.05. Thus, no significant difference was detected. As such, the null hypothesis can also not be rejected.

### **Discussion**

The statistical tests showed that the null hypotheses can not be rejected. While the statistical tests were chosen because they can accommodate a low number of datapoints, one should still be cautious with interpretation. However, the results suggest that, when discussing Ecosystem Services for a water development project, the types of services discussed fall relatively evenly in the categories for both Use and Non-Use services. As such, it suggests Relational Values do not play a large role when considering potential services. This may be because the participants were purposely limited to an anthropocentric perspective. After all, as discussed by Deplazes-Zemp and Chapman (2021), Relational Values tend to have an Intrinsic Value component as well. The results here helped in understanding the issues related to another water project, namely the Bayano dam. For one, this suggests a stakeholder with a clear anthropocentric view will consider different Ecosystem Services, but none significantly more than others. Of course, the participants involved were specifically selected and may not be representative of the population at large. Future research should take this into account.

In conclusion, this activity allows a greater understanding of the stakeholders in the workshops and, potentially, beyond. Every step that aids in understanding stakeholder positions is useful for the Stakeholder Table, which is the culmination of this thesis.

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Appendix 2 Relevant questions for the questionnaire used in interviewing the Maje Embera community

# Linking ecological processes and traditional knowledge in the Emberas of the Bayano Lake

			Questionn	aire
Information al	bout participant	ts		
Gender:	М	F		
Age:				
Community: _				
Marital Status	:			
No. of people	in household _			
No. children:				
Are you invol	ved in fishing?	Ŋ	<i>č</i>	N
If yes, is it live	elihood or com	merce?		

What aspect of fishing are you involved in:

- 1. Fishing in your boat: Y
- 2. Fishing in hired boat: Y
- 3. Boat crew: Y
- 4. Boat manager: Y
- 5. Renting your boat: Y

- N How many years:
- N How many years:
- N How many years:
- N How many years\_\_\_\_\_
- N How many years:

6.	Renting your fishing gear:	Y	Ν	How many years:
7.	Fish trading:	Y	Ν	How many years:
8.	Fish processing:	Y	Ν	How many years:
9.	Boat building:	Y	Ν	How many years:
10.	Preparing meals:	Y	Ν	How many years:
11.	Other:	Y	Ν	How many years:
Ad	ditional comments:			

Have you noticed climate or environmental variability and change in the last 10/15 years?

Yes

No

Don't know

Has the timing of the dry and wet seasons changed in the last 10/15 years? Yes No Don't know

If yes, how has it changed?

- 1. Earlier start of wet season
- 2. Later start of wet season
- 3. Unpredictable change

Has the length of the wet and dry season changes in the last 10/15 years?

Yes No Don't know

If yes, how has it changed?

1. Longer wet season, shorter dry

- 2. Shorter wet season, longer dry
- 3. Unpredictable change

Have you notice a change in the quality of the water in the Bayano Lake and/or Maje river in the last 10/15 years?

Yes No Don't know

If yes:

- 1. Reduced
- 2. Increased

If reduced, which of the following undesirable effects do you feel are linked to this change in quality?

Water born illness:	Y	Ν
Poverty:	Y	N
Poor hygiene:	Y	N
Social conflict:	Y	Ν

How common are these undesirable effects in your community?

Water borne illness:	Not common	Common	Very Common
Poverty:	Not common	Common	Very common
Poor hygiene:	Not common	Common	Very common

Social	conflict:	Not common	Common	Very common
Do you think the abundance of fish has changed in the last 10/15 years?				
	Yes	No	Don't know	
If yes,	has it generally	y:		
1.	Increased			
2.	Decreased			
3.	Don't know			
Do you think the abundance of birds has changed in the last 10/15 years?				
	Yes	No	Don't know	
If yes,	has it generally	y:		
1.	Increased			
2.	Decreased			
3.	Don't know			
Do you think the abundance of mammals has changed in the last 10/15 years?				
	Yes	No	Don't know	
If yes, has it generally:				
1.	Increased			
2.	Decreased			
3.	Don't know			

Do you think the abundance of reptiles has changed in the last 10/15 years?

# Yes No Don't know

If yes, has it generally:

- 1. Increased
- 2. Decreased
- 3. Don't know