# ENVIRONMENTAL JUSTICE AND SUSTAINABLE DEVELOPMENT.

# A COMPARATIVE Q ANALYSES IN BRAZIL'S AMAZON

Götz Kaufmann

Series of Papers: Environmental Justice and Sustainable Development No 2

2012

## Author:

Dipl. pol. Götz Kaufmann

Lecturer at Otto-Suhr-Institute (OSI), Free University of Berlin

Email: goetz.kaufmann@fu-berlin.de

## Publication Info:

Submitted at Annual Q Conference in Birmingham (2011) to Journal of Operant Subjectivity

## Contents

*Abstract*

*The presented work shows the results of a field research on two concepts in Brazil's Amazon: Environmental Justice (EJ) and Sustainable Development (SD). These contain different problem sets within the field of environmental sociology. Closely bound to the distinction problem of the two concepts, the research assumes less degree of discourse differences for the SD concept than for the EJ concept as first hypothesis. The research also based on a second hypothesis. Researching the concepts' discourses will reveal evidence for the environmental legislation failure: The difference in perception of the local environmental problem set due to the 'distance problem'. This problem consists in terms of geographic location and cultural background. Non-consideration of these, distance based, discourse differences in the process of law implementation increases chance to fail. Conducted on an island sibling called Algodoal-Maiandeua, declared environmental protection unit since 20 years, two Q methodology studies have been realized at the same time and compared in order to prove the hypotheses.*

## Introduction

The area of research is an environmental protection area [Área de proteção ambiental (APA)] with name Algodoal-Maiandeua, also just called APA Algodoal. The APA is located between the 00° 35′ 03" and the 00° 38′29" southerly latitude and the 47° 27′ 42" and the 47° 34′ 57" northerly longitude (Bastos 1996: 11) in the Brazilian Amazon, federal state of Pará, municipality of Maracanã. It is about 300km away from federal state capital of Belém. It contains two islands that are called Algodoal and Maiandeua, separated by the channel Igarapé das Lanchas. The islands provide broad ecological diversity, such as centuries old trees, dunes, freshwater lakesbeaches, mangrove woods and areas, which feed a broad variety of animal wildlife species. (SEMA 2010: 1) APA Algodoal was declared conservation unit [Unidade da Conservação], more precisely federal state area of environmental protection, established by law No 5,621 at November 27$^{th}$, 1990. The area has 19 km$^2$ or 2,378 hectare (SEMA 2011) and is inhabited by approximately 2000 people in four (4) villages (Algodoal, Mocooca, Fortalezinha, Camboinha). Village Algodoal is located on island Algodoal, containing about 50% of the population, whilst the other three villages are located on island Maiandeua. APA Algodoal is inhabited by both indigenous[1] people and migrants (newcomers) from cities or Brazilian countryside, who moved there in the last 40 years, and tourists

1 Ignoring the controversial discussion about designation right of being an Indian or indigenous origin, self-definition of this part of the local population tipped the balance for using this term.

which built weekend houses there.

According to the executing governmental organ, intention to create the APA was to reconcile human activities and the conservation of the wildlife and natural resources by bettering well-being of the people, always looking for "desenvolvimento baseado, principalmente, no ecoturismo." [development, based on ecotourism.] (SEMA 2010: 1) In 2000 federal law 9,985/2000 set requirement of residents participation in certain UCs, one of them APAs, to create a >Plano de Manejo< [Management Plan] within 5 (five) years after creation (§2). Participation was regulated at July 30, 2007 in Law 7,026, the law that created the secretary of the environment [Secretaria do Meio Ambiente, (SEMA)] in changing dispositions of Law No 5,752, created on July 26, 1993, most importantly are Art. 2 and 4. The former article gave command over environmental police forces to the SEMA in incentive VI. The latter defined conditions of state run environmental council [Conselho Estadual de Meio Ambiente] creation in incentive A, with goal to assemble the relevant stakeholder groups in the field (associations, NGOs, governmental institutions, traditional population, newcomers). Participation management structures in the Amazon emerged in consideration of an upcoming direction in Brazil's environmental regime (McGrath 2008).

In June 6, 2006 the management council of APA Algodoal was created by the SEMA to create the required management plan of development. Contemporary, seven governmental institutions[2], two scientific research institutions[3], nine local associations[4], and three NGOs[5] are officially registered as members of the council.

The most obvious local environmental problem lies in dysfunction of the given institutional structure. The management council should meet by definition four times a year, but in 2010 the council hasn't had any convention. In addition, the institutional structure has a credibility problem. Local population told, the council is just talking, but doing nothing. General problem of APA

2 >Secretaria do Meio Ambiente< (SEMA) [state's secretary of the environment], >O Projeto de Gestão Integrada da Orla Marítima< (ORLA) [the project of integrated management of maritime margin], part of the >Superintendência de Patrimônio da União no Estado do Pará< (SPU/PA), the >Delegacia Especializada em Crimes contra o Meio Ambiente< (DEMA) [specialized delegacy on crimes against the environment], the >Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais<'s (IBAMA) [Brazilian Institute of Environment and Renewable Natural Resources], the >Secretaria de Estado e Saúde Pública< (SESPA) [secretary of state and public health], prefecture's ambassador of Maracanã and Marapanim, the mayor [>vereador<] of Algodoal, who represents not just all inhabitants in Algodoal-Maiandeua, but the whole countryside of municipality Maracanã too, and the official tourism organ in the state Pará, called PARATUR.

3 >Museu Paraense Emílio Goeldi< (MPEG) [Museum of Pará Emílio Goeldi] and the >Universidade Federal do Pará< (UFPA) [Federal University of Pará]

4 >Associação Comunitária do DESenvolvimento e Preservação da Ilha de Maiandeua-algodoal< (ACDESPIM) [Common Association of Development and Preservation of Island Maiandeua-Algodoal], >Associação dos Barcheiros< [Association of Skippers], the >Associação dos Canoeiros< [Association of Canoeists], the >Associação dos Carroceiros< [Association of Coachmen], >Associação de Empreendedores de Turismo de Algodoal< (AETA) [Association of Entrepreneurs of Tourism on Algodoal], >Associação dos Moradores de Fortalezinha< [Association of Inhabitants of Fortalezinha], the >Associação dos Moradores de Camboinha< [Association of Inhabitants of Camboinha], >Associação Comunitária Pescadores Artesanais da Vila de Algodoal< (ACPAVA) [Common Artesan Fishermen Association of village Algodoal], and the >Cooperativa dos Lancheiros da ilha de Algodoal – Marudá< (CLIMAM) [Cooperative of food sellers on island Marudá-Algodoal]. The latter was formerly known as >Associação dos Lancheiros Marudá-Algodoal< (ALMA), but then transformed into the above named cooperative.

5 >Grupo Ambiental de Fortalezinha< (GAF) [Environmental Group in Fortalezinha], the >Associação Pró-Ilha de Algodoal-Maiandeua< (SUATÁ) [Association Pro-Island of Algodoal-Maiandeua], and the >Grupo Ecológico Maiandeua< (GEMA) [Ecological Group Maiandeua].

Algodoal's management council pattern appears in terms of under-representation of the indigenous population. Only two of the associations are led by native people and very few Indians are generally organized in associations. Furthermore, communication problems in the council between these two groups (native people on one side, institutions, NGOs and newcomers on the other side) are mentioned from both sides. Even though all people live in peace together on the islands in their day by day life, this circumstance reveals a challenge, probably underestimated in the environmental problem set: The distance problem. The problem appears in two shapes, as geographic distance between executing institutions of the government, which are settled more than 300 km away from the field in Belém, capital of federal state Pará, and as a cultural problem, including education differences, between native people and the newcomers. This is manifested in shift of land ownership from native people to migrants, which install proper business on this land. Selling and buying of land happens by breaking federal state's law as land use is allowed only by native population and property rights belong to the state. The above mentioned management plan is required to take action. Consequentially, contemporary situation, the lack of such a plan, prevents any solution. Using Q Methodology (see below) both the geographic distance problem and the different structure of environmental discourse differences will be presented.

The two concepts in question, Sustainable Development (SD) and Environmental Justice (EJ), “have more in common than a cursory look at either reveals” as Kameri-Mbote states (et al. 1996: 1). Both are concerned by practical impacts caused by human action, both seek for environmental regulation to resolve the problem and both are closely bound to the general concerns of protecting the environment. But they strongly differ in perception of what is the environment. Whilst SD covers all from protecting biodiversity, seeking solution for less development countries, debates about Japan's core melt accident in Fukushima and the burning Deepwater Horizon oil platform in the Gulf of Mexico to climate change issues, environmental justice (EJ) focuses on the social and racist distribution of environmental burdens, what environmental justice research calls environmental racism. Environment in EJ perspective is understood as “where we live, work, and play” (Gosine/Teelucksingh 2008: viii). Consequentially, it has much stronger claim for social justice than the Sustainable Development (SD) concept does. Ecological problems are seen by EJ as human, environmental, and local problems by those, directly involved, caused by societal circumstances. Therefore, its definition is very clear, some say, very radical too. This comes from the concepts history of black community struggles in the US against illegal toxic waste in the place where they live.

The SD concept on the contrary shares a much broader or widespread definition. This unclear

definition is partly due to its origin on global institutional projection, namely international UN conferences in Stockholm (1972), the Brundtland report (1987), and the Earth Summit in Rio de Janeiro (1992). International conventions have been organized with purpose of bringing different, mainly global, stakeholders together to institutionalize and define the concept in consensus. Within this broad understanding, SD is basically defined by economic and political development (in that order) in consideration of the ecological environment and resource usage to fulfil present needs without sacrificing the needs of future generations. The broad consensus oriented understanding of the concept nevertheless is result of a struggle over decades, in which critiques on the present economic order has been replaced by the agreement that >no (economic) growth< is not an option.

In the EJ concept, such a consensus definition isn't agreed yet, even more, it is a concept in struggle. This creates the first test hypothesis of this piece: On local projection can be shown that the struggle about the concept of EJ is in process whereas the debate about SD must be seen as finished. Indicating evidence can be seen by looking at the institutionalization process, in which governmental institutions have already structured the field, whilst EJ oscillates between incorporation into the SD debate (as one direction, cf. Hopwood 2005: 41) or remaining separated in structure and orientation (Gosine et al. 2008: 14).

For theoretical consideration, the named circumstances create a paradigm gap for environmental research in social sciences. Since in the SD concept all anyhow related topics could and can be located, it is ineligible as a general theoretical paradigm[6]. Environmental Justice – on the contrary – is seen as a new paradigm in environmental sociology. According to Elvers, EJ analysis has to be made in continuation of four decision steps and nine decision fields (2007: 21). In opposite to Barry's three main stages of policy making (1999: 337), and therefore an important contribution to both the analysis of environmental settings and environmental policy making patterns, Elvers' approach avoids a linear understanding of environmental problem handling.

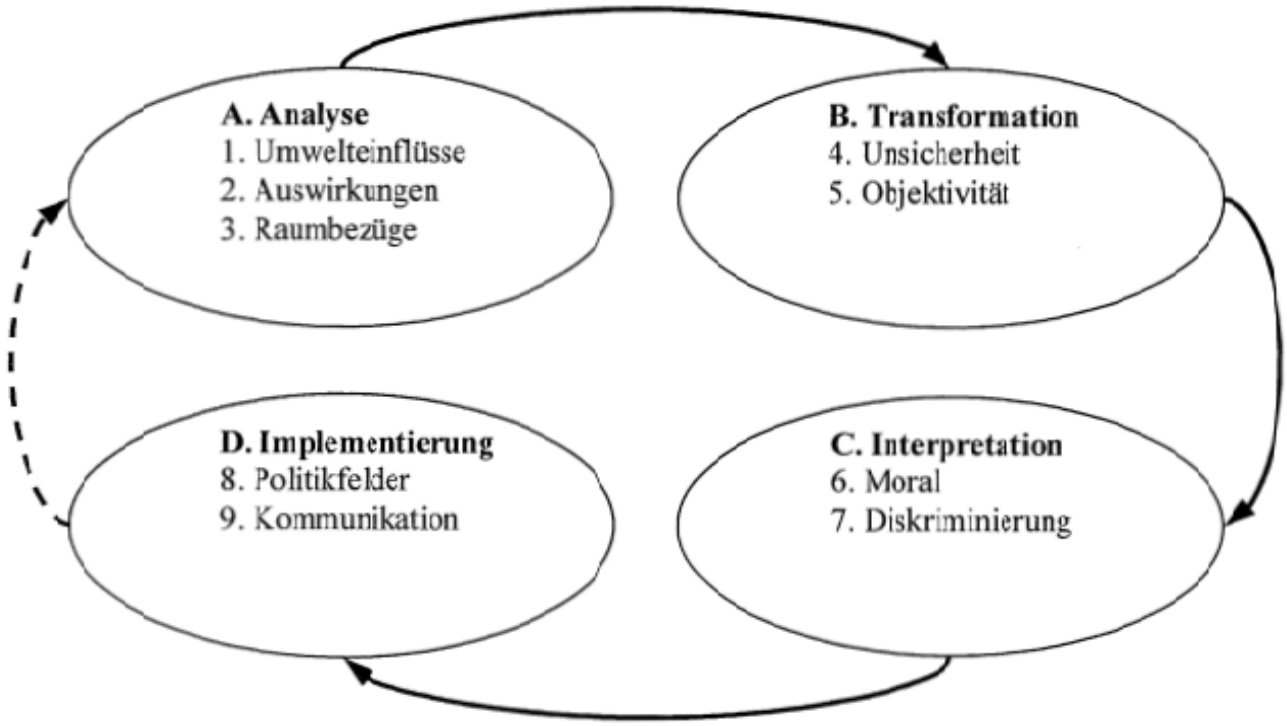
He rather goes from identification of a problem set to solution by implementation of proper policies, but assumes a circle of step and field sequences until a solution is found[7]. This is the aspect of Elvers' research paradigm with goal to a solution, suitable to all stakeholders in the field that he calls 'processual'. It consists in four main steps, two are abstract, analysis (A) and transformation (B), and two are concrete: interpretation (C) and implementation (D). A is defined by negative environmental impacts (field 1.), which sphere of life (field 2.), and referenced space (field 3.). The

6 As more topics are very general includable as less certain can a general frame be created which still covers all different opinions in the field.

7 Therefore, analysis of a field does not have to begin at step 'A' but can start before and after. This is important in regards to the given case study, in which the implemented initial law is about twenty years in the past, but ample literature traces the process to the present point. Within this paradigm theoretical consideration of qualitative research on APA Algodoal in 2003 could be included as part of the circle (cf. Kaufmann 2003).

transformation phase (B) attempts to calculate risks and chances of possible consequences (field 4.) on the one hand and trustworthiness of institutions, knowledge, and information on the other (field 5.). This leads to what Elvers calls the 'core of EJ discourses'.

Graphic 1: Processual Research Paradigm




Source: Elvers 2007: 28

The interpretation (C) of concrete consequences in consideration of moral deliberation (field 6.) as well as [racial, social, gender etc.] discrimination (field 7.). Undertaken measures are located in the implementation phase (D), in which policies (field 8.) and communication (field 9.) create the frame of a compromising solution.

Only if an all-suiting agreement is found, “kann von einer umweltgerechten Entscheidung gesprochen werden. Falls nicht, beginnt der Entscheidungsprozess unter dem Vorzeichen einer möglicherweise nun modifizierten umweltbezogenen Entscheidung von vorn” [can be spoken of an environmentally just decision. If not, the decision process restarts under condition of a now possibly modified environment related decision] (Elvers 2007: 27-28).

Requirement for such a solution is knowledge and acknowledgement of existing discourses in a given field in linkage to the ‘perceived justice’ notion (Maguire/Lind 2003). That means at least

agreement of people's majority to necessity of applied regulation (cf. Amerasinghe et al. 2008, Köckler 2011: 98). More concrete, environmental policy making cannot succeed as long particular discourses in the field aren't discovered and considered. On the contrary, environmental legislature will fail more likely, if consensus regarding the required legal steps is not achieved, so, existing discourses aren't recognized. This fits best to what Jason Sharman stated: Even global governmental approaches are powerless against the 'weapons of the weak', as used by NGOs, small island states or mediaeval 'hold-overs' (2003: 2), mainly due to their local insights.

This aspect points to the practical problem in the researched field: The penetration failure of the existing environmental law. The dysfunction of APA law on Algodoal-Maiandeua is mentioned all along for different reasons, even in most recent researches (Barros 2010: 62; Figueiro/Santana 2010: 222). Down to earth evidence is in incapability to resolve the environmental problem set. Mentioned powerlessness can be found by looking into the perception of the problem set. Hereby, discourses on two concepts have been analysed: First discourses on Sustainable Development (SD) and second distinguishable understanding on the Environmental Justice (EJ) concept.

## Method considerations

In order to reveal distinguishable discourses in the field, Q Methodology was chosen as method (Barry/Proops 1999, Webler et al 2009). To test the hypothesis, Q methodology will be used to discover and compare environmental discourses in the field. Beside many other powerful tools in sociology, for answering the given question, Q methodology is a profound answer to the generalization problem and therefore an important contribution to the debate about proper methods in environmental sociology. Using Q a principle method bias can be avoided by excluding the researcher himself as far as possible from data measurement. The bias is in research practices, which base on similar preconceptions (culturally, by education or gender among other possible aspects) of the researcher himself, most likely come to „denselben oder ähnlichen Interpretationen" [the same or similar interpretations] (Girtler 2001: 79, cf. Lechner/Boli 2004: 85). On the other hand, the bias appears in sociological research in terms of over-rapport or over-identification in the meaning of adopting rationality of the field too strongly and losing a distant perspective when analysing the field. Application of Q Methodology has been conducted with reference to general processing as outlined by Previte et al (2007: 137-140).

### Execution of Q study

In Q methodological terminology spoken, the two discourses in question are the concepts

Sustainable Development (SD) and Environmental Justice (EJ). Ninety-eight statements are drawn from both literature and qualitative data. The latter means qualitative conversations[8] centred on two questions: How does the actor understand the EJ and SD concept in the context of APA Algodoal-Maiandeua? Twelve qualitative conversations have been conducted, six have been made with those who later on belonged to the Q sort, namely institutionalized representatives (governmental and non-governmental) in the management council on Algodoal-Maiandeua (SEMA, SPU/PA, ORLA, SUATA, one president of a local association). Others have been a poet, expert for the islands and secretary of culture in Maracanã, and five native born Indians from villages Algodoal and Fortalezinha. The conversations have been performed from September to October 2011. Twenty-eight statements could be extracted from the named conversations in the field. Further twenty-nine statements have been drawn from international literature (twenty-five from English literature (Barry/Proops 1999, Clapp/Dauvergne 2005, Gosine/Teelucksingh 2008 among others), four from German literature (Kaufmann 2003)), and forty-one statements came from Brazilian literature (Acselrad 2009, Romeiro 1999, Nobre 2002, Santana/Figueiredo 2010 among others)).

These have then been classified and reduced in a concourse matrix (Table 1). For the purpose of this study, the matrix was built in consideration of both John Dryzek (1997) [horizontal] and Jennifer Clapp et al. (2005) [vertical].

Table 1: Concourse Matrix: Sustainable Development (SD) / Environmental Justice (EJ)

| Total (SD/EJ) | Definitive | Designitive | Evaluative | Advocative | SUM |
|---|---|---|---|---|---|
| **Market Liberals** | 3 (2/1) | 4 (3/1) | 2 (1/1) | 2 (1/1) | **11 (7/4)** |
| **Institutionalists** | 2 (1/1) | 3 (1/2) | 3 (3/0) | 2 (0/2) | **10 (5/5)** |
| **Social Greens** | 3 (1/2) | 4 (2/2) | 3 (1/2) | 3 (1/2) | **13 (5/8)** |
| **Bioenvironmentalists** | 1 (1/0) | 1 (0/1) | 1 (1/0) | 1 (0/1) | **4 (2/2)** |
| **SUM** | **9 (5/4)** | **12 (6/6)** | **9 (6/3)** | **8 (2/6)** | **38** |

The measure for reduction based on the following priority list: Most relevant have been statements, told by sorts in the conversation and have been used in the same wording (now translated from Portuguese to English). Second most important has been Amazon discourses, found in local literature.

For reduction of Q samples' statements (Table 2 and 3), at least representation of one statement in each category for either the Environmental Justice (EJ) or the Sustainable Development (SD) concept was defined as the requirement. Generally, more important than equal distribution of statements in the concourse matrix has been to display what was told as most relevant in the

8 In recognition to Girtler's critique on interview as way to gather information (2001: 147-148), the process is characterized as 'conversation'.

qualitative conversations. Therefore, the range of EJ statements, for instance, contains fewer statements in the market liberal classification than the SD statements do. The other way around is true for social green classified statements in the SD Q sample.

Table 2: Concourse Matrix by defined statements (SD)

| | Definitive | | | Designative | | | Evaluative | | | Advocative | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Market Liberals** | 3 | 19 | | 15 | 12 | 18 | 5 | | | 9 | | |
| **Institutionalists** | 10 | | | 7 | | | 6 | 11 | 17 | | | |
| **Social Greens** | 16 | | | 1 | 13 | | 14 | | | 2 | | |
| **Bioenvironmentalists** | 4 | | | | | | 8 | | | | | |

Table 3: Concourse Matrix by defined statements (EJ)

| | Definitive | | | Designative | | | Evaluative | | | Advocative | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Market Liberals** | 11 | | | 3 | | | 14 | | | 17 | | |
| **Institutionalists** | 4 | | | 13 | 15 | | | | | 2 | 9 | |
| **Social Greens** | 1 | 10 | | 16 | 19 | | 5 | 7 | | 6 | 18 | |
| **Bioenvironmentalists** | | | | 8 | | | | | | 12 | | |

By using the 'concourse matrix' 98 (ninety-eight) statements have been reduced to a number of n=19 each, 38 for two Q sorts in total.

The Q Sample and Q Sort

As representation of the populations on Algodoal, the members of the management council have been chosen as P-set for the Q sorting. The formal number of members has been reduced by analysis based on research and conversations. The result bared certain agents such as the representatives of municipality of Marapanim, IBAMA, and PARATUR which haven't attended to the management council's meetings so far. These have been removed from the P-set as they cannot properly contribute to contemporary discourses on the island. Information of supposed DEMA agent by qualitative conversation showed that they aren't part of the environmental protection division, but belong to the military police forces. That is why this agent is furthermore marked as 'police' instead of DEMA.

In addition to the management council's participants, three members of the indigenous population have been added due to the under-representation problem in the management council as mentioned above. To consider the viewpoint of the national government, the SPU/PA itself, in addition to its agent (ORLA) in the management council, has been included in the P-set.

Just nineteen of twenty-two participants have concluded the EJ Q sorting. The sorting has been done in accordance to the Q pyramid (cf. table 4) and has been conducted from October to

December 2011.

Table 4: Q pyramid

| Scale score | -4 | -3 | -2 | -1 | 0 | +1 | +2 | +3 | +4 |
|---|---|---|---|---|---|---|---|---|---|
| No of statements | 1 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 1 |

Q Analyses

The Q analysis was made with PQMETHOD (Schmolck 2011), using centroid procedure for factor analysis and VARIMAX rotation to extract factors which are significant 'ideal type' discourses in accordance to the protocols of Q methodology. In consideration of the PCA results, four factors have finally been extracted from both sorting using automatic flagging[9]. Further testing of another number of factors by rotating the factors manually hasn't improved the results.

Hypotheses testing will be realized in two steps: Comparison and interpretation (based on qualitative data too) of the results of two principle component analyses (PCAs) and the Q analyses, as well interpreted in comparison to each other.

Comparative Principle Component Analysis (PCA)

As a first step, PCA has been applied to both discourses. In order to compare the two discourses, the mentioned three participants, which just have concluded one of the two sets, were neglected (equal P-set). A few words about the comparability of the data sets by these PCAs in advance: The number of statements has been equal in both sets, consequentially the range of possible discourses is as big in one set as in the other one, the time period, in which the statements have been drawn and the sorting has been conducted, was the same, the persons participating in the sorting have been the identical, and the field of research, has been the same too.

Whilst factor 1 of the SD Q sample has an eigenvalue of 8.13, standing for about 37% of all statements, the same factor of the EJ data set (eigenvalue 5.33) represents just 28% of the discourses in the given Q sample. Factor 2 (eigenvalue 3.11) of the EJ data adds another 16.36% to the explaining variance, whilst the second SD factor, with an eigenvalue of 2.66, just adds 12%. This continues in the following factors (i.e. 11.41% or eigenvalue 2.16 in the EJ set opposed by the SD set value of 8.97% or eigenvalue 1.97, or the EJ values of factor 4 (9.86% or eigenvalue 1.87) versus those from the SD set (7.87% or eigenvalue 1.73). Different arguments, represented by single statements, to define different positions of understanding the concepts, are assembled in higher density in factor 1 of the SD set than in same factor of the EJ data collection. So, about 9%

9 PQMethod generally does flagging of „a sort anytime its factor loading is greater than ABS(2.58÷√N).“ (Webler 2009: 31) So, a sort is flagged if its factor loading is >2.58÷√N.

more statements are included in the first factor of the SD set than of the EJ set, whilst the second factor of the EJ set has just 4% more than its counterpart in the SD set.

Table 5: PCA Analysis of SD and EJ

| Unrotated | Sustainable Development | | | Environmental Justice | | |
|---|---|---|---|---|---|---|
| Factors | Eigenvalue | As Percentages | Cumul Percentages | Eigenvalue | As Percentages | Cumul Percentages |
| 1 | 8.1316 | 36,9619% | 36,9619% | 5.3291 | 28.0479% | 28.0479% |
| 2 | 2.6560 | 12,0729% | 49,0348% | 3.1083 | 16.3594% | 44.4073% |
| 3 | 1.9724 | 8,9656% | 58,0004% | 2.1696 | 11.4187% | 55.8260% |
| 4 | 1.7308 | 7,8672% | 65,8677% | 1.8738 | 9.8623% | 65.6883% |
| 5 | 1.5427 | 7,0121% | 72,8798% | 1.4906 | 7.8452% | 73.5335% |
| 6 | 1.2365 | 5,6204% | 78,5002% | 1.3524 | 7.1179% | 80.6514% |
| 7 | 0.9495 | 4,3161% | 82,8163% | 0.7817 | 4.1143% | 84.7657% |
| 8 | 0.7516 | 3,4164% | 86,2327% | 0.7514 | 3.9546% | 88.7203% |
| 9 | 0.6639 | 3,0177% | 89,2504% | 0.6156 | 3.2399% | 91.9602% |
| 10 | 0.6176 | 2,8073% | 92,0577% | 0.4792 | 2.5222% | 94.4824% |
| 11 | 0.5265 | 2,3934% | 94,4511% | 0.3366 | 1.7714% | 96.2538% |
| 12 | 0.4070 | 1,8498% | 96,3010% | 0.2430 | 1.2787% | 97.5325% |
| 13 | 0.2786 | 1,2663% | 97,5673% | 0.2173 | 1.1435% | 98.6760% |
| 14 | 0.2146 | 0,9756% | 98,5429% | 0.1735 | 0.9134% | 99.5894% |
| 15 | 0.1706 | 0,7754% | 99,3183% | 0.0531 | 0.2792% | 99.8686% |
| 16 | 0.0783 | 0,3561% | 99,6744% | 0.0207 | 0.1087% | 99.9773% |
| 17 | 0.0561 | 0,2548% | 99,9292% | 0.0041 | 0.0218% | 99.9993% |
| 18 | 0.0156 | 0,0708% | 100,0000% | 0.0002 | 0.0008% | 100.0000% |
| 19 | 0.0000 | 0,0000% | 100,0000% | 0.0000 | 0.0000% | 100.0000% |

As result, the first hypothesis can be confirmed. The comparison between two principle component analyses shows that – as suggested – discourses about the definition of the SD concept in the field are less differentiated than discourses in regards to the concept of EJ. In the final conclusion, arguments from qualitative data comparison based on the Q analyses results will complete this statement.

Procedure of Q Analysis

Next, the second hypothesis will be tested by answering the question, whether the environmental problems can be linked to different understandings of the concepts. For seeking environmental discourses in the two concepts, complete Q samples of participants have been used, 22 persons have concluded the SD sorting and 19 have done the EJ sorting.

The score of the analyses will be presented in two ways: First, discourses narratives of the two sorting will be presented and reviewed to show the problem set pattern. This will give access to the geographic distance problem. Second, Q sort correlations of each sorting will be analysed and compared. The related matrix of either the EJ or the SD sorting is complemented by two lines. One is the 'SUM' column, which lists the midpoints of all sorts, the other is the 'SUM' row, which sums

up all values of the sorts (which is basically the same, but differs in representation). An overall midpoint average (OMA) is used to compare and interpret variances of single sorts. The tables will be analysed under condition of negative variance from the midpoints. This means, that generally sorts of a variance of >/= 25%[10] below the OMA are considered as relevant. In the following, the evaluated Q sorts were cross-checked in both sorting. Generally, Q sort correlations demonstrate, how far (and close) opinions of single sorts are to each other. Therefore, differences and congruency between stakeholder groups of different origin, as mentioned (institutions, NGOs, native population and newcomers), can be analysed. Influential and powerful stakeholders like SEMA and 'police' will get particular attention. This contributes also – as described in the first step – to both the cultural and geographical distant problem.

Sustainable Development and Environmental Justice discourses

In the appendix, the normalized factor scores for each discourse are listed[11]. Strength of agreement and disagreement to single statements of the discourses are presented by both the ideal type discourse sort and the (better) comparable Z-score[12]. Using trial-and-error method with manual rotation, four factors[13] have been extracted in consideration of the outlined PCA results.
In accordance to the Q analysis, each factor will be narratively presented as discourse A, B, C and D. Distinguishing statements[14] are presented in tables 6 and 7, classified as agreement, no agreement and disagreement[15]:

Table 6: Distinguishing Statements for each factor in the SD set

| Discourses | Agreement (RNK +2 to +4) | No Agreement (RNK -1 to +1) | Disagreement (RNK -2 to -4) |
|---|---|---|---|
| **A** | 7 (+2; 1.09), 8 (+2; 0.68) | 18 (-1; -0.57) | 3 (-3; -1.36), 5 (-2; -0.98) |
| **B** | 10 (+4; 1.58), 4 (+2; 1.35) | 17 (0; 0.09), 3 (0; -0.08), 9 (-1; -0.53) | 13 (-3; -1.27) |
| **C** | 18 (+4; 1.50), 14 (+2; 0.66) | 12 (+1; 0.59), 19 (-1; -0.28) | 17 (-2; -1.09), 10 (-3; -1.10), 3 (-4; -2.44) |
| **D** | 3 (+2; 0.86) | - | - |

10 There is no statistical evidence for significance 25% below OMA. This number is reasonable, since provided output gave space for proper interpretation, whilst including all sorts below the OMA had not given better interpretation than already are based on the smaller scale.
11 The original statements have been in Portuguese and are here translated into English.
12 The Z-score expresses the degree of agreement and disagreement in a comparable manner. Whilst the simplified ideal typified structure within the Q pyramid (in this case from +4 to -4) paints a picture within the given Q sorting frame, the Z-score analysis helps to weight the answers in between.
13 Since PCA created its principle components basing on unrotated factors, explaining variance of the factors may change. As result, the 4 discourses still represent 66% of all given answers. Due to simplifying loadings, for the SD set discourse A stands for 20% of all statement differences then, whilst discourse B represents 22%, discourse C 11% and discourse D 13%. In case of the EJ set, discourse A represents 23%, followed by B with 19%, C with 11%, and discourse D which stands for 12%.
14 All statements of the discourses have a statistical error margin of $P < .01$, meaning that the chance for a statistical error in regards to the certain statement is below 1%, beside of the Asterisk labelled (*) statements for which apply $P < .05$.
15 'Statements with position of >Agreement< or >Disagreement< are further considered as 'strong'. >No agreement< statements are also described as 'moderate'.

Table 7: Distinguishing Statements for each factor in the EJ set

| Discourses | Agreement (RNK +2 to +4) | In between (RNK -1 to +1) | Disagreement (RNK -2 to -4) |
|---|---|---|---|
| A | 19 (+4/2.29) | 10 (+1/0.44), 1 (-1/-0.25), 15 (-1/-0.27) | 3 (-2/-1.06), 5 (-3/-1.07), 17 (-3 /-1.45) |
| B | 18 (+4/1.60), 12 (+3/1.18), 3 (+2/0.93), 7 (+2/0.76) | 9 (+1/0.31) | 10 (-2/-0.61), 1 (-2/-1.17), 5 (-3/-1.72) |
| C | 17 (+3/0.98) | 1 (+1/0.77) | 4 (-2/-0.90), 3 (-3/-1.85), 19 (-4/-1.95) |
| D | 4 (+3/1.24) | 3 (-1/-0.25) | 9 (-2/-0.87), 12 (-3/-1.10), 1 (-4/-2.11) |

Four Discourses on Sustainable Development

*Discourse A: institutional eco-preservation driven, market-skeptical, pro 'zero growth'*

This discourse favours the following as 'strong' statements: It agrees to statements 7, 8 and disagrees to 3, 5*, whilst statement 18 is considered as 'moderate'.

Most distinctive argument (7; +2/1.09) of this discourse and in opposite to all others (B -1/-0.75, C -2/-0.72, D -3/-1.37) is its emphasis of absolute limits to economic growth, which is why growth must stop at a certain point, since technical progress cannot qualify the environmental limits (5; -2/-0.98). This opinion sees increasing anthropocentrism in the community of inhabitants as one of the most defining negative impacts of Sustainable Development on Algodoal-Maiandeua (8; +2/0.68) and does not follow the market liberal arguments that see positive impacts of the economic development on an individual (18; -1/-0.57) and societal level (3; -3/-1.36). The latter is of special importance as it is, like the first argument, the most distinguishing statement in the field and the only one which is declared significant for all four discourses. In other words, all four discourses have labelled this statement as important to defining their opinion, but with different loading (B: 3, 0/-0.08; C: 3, -4/-2.44; D: 3, +2/0.86). This strong decline locates this discourse close to discourse C, who refuses the 'limits to growth' (C: -2/-0.72) and anthropocentrism (C: -3/-1.29) argumentation uncompromisingly.

*Discourse B: environmental admonisher, institutionalism focussed*

Agreement to 10 and 4, disagreement to 13 and 9* and a position of no agreement towards 17 and 3 frames this discourse.

This viewpoint favours at the first place the understanding, that SD on APA Algodoal is defined by an equilibrium of human and environmental development without giving priority to one or the other (10, +4/1.58), but also warns for a close catastrophe for humanity due to non-consideration of environment's absolute limits for economic growth (4, +2/1.35). Very strong too, this perspective refuses the claim, that the abuse of drugs on the islands is caused by human development (13, -3/-1.27). Rather no agreement is given to the statement that economic growth is accompanied with

felicity on Algodoal-Maiandeua (9, -1/-0.53)[16]. As only discourse of the four, this view doesn't agree to the statement, that creation of the management plan should rather be done by inhabitants than governmental institutions (17; +0/0.09) and to the argument, that economic growth is a positive force able to eliminate social disparities for acceptable environmental costs (3; +0/-0.08). In regards to the latter, all other perspectives show a clear opinion to either agree or disagree (3; A: 3/-1.36, C: -4/-2.44, +2/0.86). Strong agreement can is found in regards to statements that deliver a more 'technical' definition of the concept, whilst distinguishing arguments in regards to 'political' questions are not refused, but avoided in commitment. This 'technical' approach considers less very local, specific, non-generizable opinions by favouring more abstract and scientific understanding of the problem. Nevertheless, this view has inside knowledge to the field problem too: Drugs aren't a phenomenon coming from contemporary human development, but from tradition, at least in Fortalezinha[17] (Kaufmann 2003: 64-65), but whether the abuse of drugs is a consequence of human development might be questioned.

*Discourse C: anti-capitalist, social-liberal, practitioner*

Discourse C has the clearest and strongest positions, not just in number of statements, but in loading on single arguments too. It is balanced by both agreements (18, 14, 12) and disagreements (19, 17, 10, 3), one of each pole contains a 'moderate' statements, statement 12 (agreement) and 19 (disagreement), but just stands for 11% of statement differences between the 4 discourses.

Basically, this opinion is framed by two statements on each end of the scale: Positive impacts of economic growth to eliminate existing social disparities by acceptable ecological costs are refused (C: 3, -4 compared to D: 3, +2; B: 3, 0; A: 3, -3). The negative Z-score loading is also the strongest position within all discourses (C: 3, -2.44 vs. D: 3, +0.86; B: 3, -0.08, A: 3, -1.36), not just in regards to the named statement, but compared to all other statements recognized as significant (ranging from B: +1.58 to A: -1.36) and non-significant (D: +1.894 to D: -1.881) for defining discourses in the field. The disbelief in free market forces is accompanied by strongest support (18, +4/1.50) for perceived more options, liberty and a better well-being [in the socio-economical life]. None of the other discourses would disagree to this fact, but none would agree too and the one discourse, which considers this statement as relevant for its opinion, would rather disagree (18, -1/-0.57) than agree. Furthermore the discourse fairly agrees to the opinion, that prostitution is an impact of present Sustainable Development on Algodoal-Maiandeua (14, +2/0.66) and agrees a

16 Since this statement appears in the consensus statement's section too.
17 and there is no argument why it should be different in the other villages

little bit to the viewpoint that nowadays (mass) tourism on the islands is the solution to develop the islands, especially because fishing isn't a source of revenue all periods of the year (12, +1/0.59). As an exception, the discourse doesn't disagree to the opinion like all the others, that the only thing they miss would be cars on the conservation unit (19, -1/-0.28). On the other hand, the discourse either doesn't agree to the idea that inhabitants of the islands themselves should create the management plan for development (17, -2/-1.09). By no means, Sustainable Development is seen as equilibrium without priorities (10, -3/-1.10) and therefore this discourse opposes discourse B, which most strongly favours this argument to define Sustainable Development in the regional context of islands Algodoal-Maiandeua (B: 10, +4/1.58).

*Discourse D: market-liberal*

The last discourse is the weakest in distinguishing arguments of how to see Sustainable Development on Algodoal-Maiandeua. Nevertheless, this discourse is crucial for understanding the range differences in the field, since it can explain more difference (13%) than discourse C (11%). This discourse just bases upon one statement, which also is the most distinguishing statement in the field. Discourse D's agreement to statement 3 (+2/0.86) is important due to rejection (A: 3, -3/-1.36; C: 3, -4/-2.44) and ignorance (B: 3, 0/0.08) of the other discourses.
In this understanding, the SD term stands for economic development without limits to growth in order to resolve the environmental as well as social inequality problem set. The predominance of the argument in this discourse bares favour of resolving social inequality claims with accepted, since inevitable, dis-recognition of the environmental challenge to obtain the benefits.

Four Discourses on Environmental Justice

Looking now at the results of the Q Analysis extraction of four EJ discourses, characteristics of the four discourses will be revealed under equal terms as in the SD discourse narratives:

*Discourse A: institutionalism focussed, communitarian, social*

Discourse A agrees to one statement (19), but disagrees strongly to statements 3*, 5*, and 17. In the field of neither strong disagree and strong agree, this perspective takes position for tending to agreement (statement 10) and disagreement (statements 1 and 15*).
This discourse favours the waste problem as the major Environmental Justice problem on APA Algodoal (19, +4/2.29), but doesn't see the paupers as responsible and victim of this damage to the environment (3, -2/-1.06). Even though injustice results from stakeholder influence that is strongly

linked to their economic power (17, -3/-1.45), this perspective disagrees that institutions aren't able to resolve the environmental question in this regards (5, -3/-1.07). For defining the concept of Environmental Justice, communitarian resources use rights have to be considered but don't play a very central role (10, +1/0.44). The latter is also true for the representation of natives in the management council and their cultural marginalization to which is rather disagreed (15, -1/-0.27). Even more, this discourse assumes that it is rather in nature of humans to want more and more money (1, -1/-0.25).

*Discourse B: institutionalism focussed, environmental racism awareness, eco-analytical*

This is the most diversified discourse in the whole set since considering 8 (eight) statements in total as being significant, so perspective explaining. To four (4) of the statements discourse B agrees strongly (18*, 12, 3, 7) and to one (1) fairly (statement 9) whilst rejecting statements 10, 1, and 5*. This opinion bases in definition and understanding of Environmental Justice on typical, analytical terms, first of all, on unequal shared costs and benefits, but health issues too. Strong argument is the comprehension, that the majority of the population on the islands is excluded from environmental goods whilst suffering more from environmental costs and that these impacts create struggles which cannot be ignored (18, +4/1.60). Evidence for Environmental Justice failure on Algodoal-Maiandeua is seen by cases of malaria and yellow fever (12, +3/1.18). Both responsible and victim of environmental damages are the poor people (3, +2/0.93), but the costs are carried by non-white people and future generations (7, +2/0.76). Obviously the understanding of how to achieve Environmental Justice on Algodoal requires – according to this opinion – a Sustainable Development strategy, able to establish specific regional obligations to create a new concept of modernity by inventing a new civilization basing on the ideas of respect, knowledge and love to nature (9, +1/0.31). In contrary to discourse A (10, +1/0.44), this viewpoint rejects reconsideration of antique understandings in modern society (B: 10, -2/-0.90). In consideration of human's desire by nature to always want more and more money (1; -2/-1.17), discourse B believes that institutions are certainly able to answer the environmental question (5; -3/-1.72).

*Discourse C: economical individualism, subjection of environmental concern*

The third discourse is mainly defined by disagreements to the statements for defining its opinion. Disagreement to more than half of the statements (4, 3*, 19), relevant to this opinion, are opposed by one to which is strictly agreed (17*) completed by one (1) with no agreement without disagreeing.

Strongest statements of this discourse is the refuse of waste as the major problem on islands Algodoal-Maiandeua (19, -4/-1.95) and the belief that stakeholders with more economical power have and should have more influence than those without (17, +3/0.98). As this opinion rather assumes (on a Z-score difference of just 0.21) that to want more and more money is not naturally given to mankind (1, +1/0.77), the former argument creates the belief that those who accomplish economic success can and should take higher responsibility. Furthermore, Environmental Justice cannot be defined and understood in terms of needs satisfaction of today without sacrificing the needs of future generations (4; -2/-0.90). Last but not least, the understanding of paupers as causers and victims of environmental damage is neglected (3; -3/-1.85).

*Discourse D: SD based environmentalist, EJ incorporating*

Similar to discourse C, discourse D focuses on the agreement to one statement (statement 4), covering the whole 'positive' statement behaviour of this discourse. Even no agreement rather tends to disagreement (3). Finally, disagreement to three statements completes this perspective (9, 12, 1). Most relevant to defining Environmental Justice is the Brundtland report's definition as considered in the Brazilian Constitution (Art. 225), stating to not sacrifice the needs of future generations to fulfil present needs (4, +3/1.24). This view sees basically no difference between the problems, faced by the Sustainable Development notion, and the Environmental Justice concept. As consequence mankind's nature to want more and more money (1, -4/-2.11), a new concept of modernity (and therefore development) is required to invent a new form of civilization basing on consideration of regional specifics and love to nature (9, -2/-0.87). Cases of malaria and yellow fever aren't the failure for Environmental Justice on Algodoal-Maiandeua (12; -3/-1.10).

Comparison of the SD and EJ discourse narratives

Looking at the two discourse narrative sets, SD set's discourse A, as the one with highest explaining variance according to the PCA (36.96%), presents pretty clearly the present problem set, but without offering a solution. Discourse C of the same set, on the other hand, combines antagonisms within the SD concept, as discussed at the beginning. It favours the tourism as it happens today, but also disagrees that this type of development has any positive impact on eliminating social disparities. In regards to the EJ set, the discourses circle around institutional solutions, no one favours protests of civil society, the historical roots and origins of EJ, but rather focus on institutional solutions, or, take position of economical individualism. As can be seen, the discourses favours a solution within the existing environmental solutions and don't focus on any form of

'system change' or critique on system inherent distribution as such, but seeks for more equal re-adjustment.

Basically, single discourse narratives revealed what was perceived as the environmental problem set on the island siblings Algodoal-Maiandeua by qualitatively observation and conversation. For the purpose of comparison, the spread of statements in the two discourse sets will be overlooked in the following. What can be found in the SD set is, as mentioned in the narratives, one statement[18] has been recognized by all discourses as significant, three statements are considered by two discourses[19] and two statements have been acknowledged as being consensus[20] between all four discourses. The first statement, for which differences have been too small to be relevant – and therefore couldn't be distinguished –, states that the result of the Sustainable Development process is a community focused on consumption (1; A: -1/-0.18; B: +1/0.19; C: -1/-0.51; D: +1/0.31). The second one recognizes development, or economic growth, as accompanied by increasing felicity of the people (9; A: +1/0.30; B: -1/-0.53; C: +1/0.38; D: 0/0.21).

The EJ on the other hand reveals two statements[21], that have been labelled significant by all discourses, and seven statements[22] as significant for two different discourses and no consensus statement.

The difference between the two discourse sets is evident and proofs the initial hypothesis in terms. Controversies within the given frame of chosen statements in the given field and with the chosen participants about the concept of Environmental Justice are more disputed than in the SD set: First of all, there has been not one consensus statement in the EJ set whilst the SD set had two, more than three times as much statements than in the SD set (seven to two) have been chosen to be significant for a minimum of two discourses, and only one statement has been significant for all discourses in the SD set, but two have been in the EJ set. For interpreting these results, one might consider that a consensus statement would suggest that there is no dispute about this defining statement. So, if no consensus statement is found, a dispute about all statements consists. Second, as more discourses one and the same statement as significant and defining for their opinion, as more distinguishing must the opinions be since distinguishing statements are made in distinction to the other discourses ideal rotated factors. Consequentially, in both other cases the EJ set results trump the distinction of statements in the SD set.

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18 Statement 3

19 Statements 10 (discourses B and C), 17 (discourses B and C), and 18 (discourses A and C)

20 When looking on the single correlations between discourses one cannot find statistical evidence for significance. Differences of statement 9 in all arrays have been below the defined paradigm of relevance, Z score difference of 0.831 in discourse A-B, -0.908 in B-C, and 0.738 in B-D. In consideration of this, delineated significance of statement 9 for discourse B must 'posthumously' be rejected.

21 Statements 1 and 3

22 These are the statements 4, 5, 9, 10, 12, 17, and 19

Q sort correlations

After looking at the existing two times four discourses in the field, Q sort correlation matrix comparison is the next step to give evidence for the mentioned distance problem. Hereby, an 'overall midpoint average' (OMA) is introduced as reference point for the following examination. It can show, how much each sort has in common with the other sorts at an average. Sorts, which are significantly (25%) below this average, are assumed to be relevant for giving evidence. Those, closer to the average similarity between different understandings would turn conclusions into a more speculative and arbitrary manner. Considering initial thoughts on method biases, Q's qualiquantitative dealings with this issue provides another opportunity.

Although focus of interest are the Q sort correlation matrixes as presented in the two following tables.

Table 10: Q Sort Correlation Matrix: Sustainable Development

| Sorts | SEMA | PT1 | ORLA | Ass1 | Ass2 | PT2 | PT3 | GAF | Ass3 | SPU/PA | PT-MPEG | SESPA | Ass4 | Ass5 | Maracana | PT4 | Vereador | Policia | Ass6 | Ass7 | Ass8 | SUATA | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SEMA** | 100 | 26 | 6 | 17 | -13 | -1 | 21 | 24 | -6 | -1 | 33 | 6 | 13 | -24 | 41 | 12 | 1 | 28 | 7 | -21 | 28 | -30 | **12,1** |
| **PT1** | 26 | 100 | 50 | 53 | 37 | 22 | 51 | 31 | 40 | -4 | 31 | 29 | 44 | 39 | 47 | 37 | 53 | 20 | 27 | 37 | 51 | -4 | **37,1** |
| **ORLA** | 6 | 50 | 100 | 43 | 67 | 48 | 66 | 43 | 71 | 32 | 31 | 43 | 61 | 76 | 67 | 41 | 59 | 1 | 49 | 36 | 53 | 9 | **47,8** |
| **Ass1** | 17 | 53 | 43 | 100 | 13 | 21 | 33 | 17 | 39 | 42 | -8 | 14 | 22 | 30 | 21 | 59 | 56 | -16 | 22 | 33 | 73 | -3 | **31** |
| **Ass2** | -13 | 37 | 67 | 13 | 100 | 63 | 27 | 46 | 53 | 37 | 26 | 16 | 46 | 49 | 43 | 4 | 27 | -17 | 39 | 28 | 31 | 2 | **32,9** |
| **PT2** | -1 | 22 | 48 | 21 | 63 | 100 | 33 | 50 | 40 | 39 | 18 | 20 | 43 | 63 | 43 | 47 | 38 | -14 | 58 | 61 | 53 | 20 | **39,3** |
| **PT3** | 21 | 51 | 66 | 33 | 27 | 33 | 100 | 46 | 56 | 7 | 58 | 48 | 39 | 54 | 62 | 59 | 18 | -9 | 66 | 26 | 30 | 3 | **40,6** |
| **GAF** | 24 | 31 | 43 | 17 | 46 | 50 | 46 | 100 | 40 | 11 | 47 | 18 | 58 | 26 | 61 | 32 | 3 | 4 | 31 | 10 | 37 | 10 | **33,9** |
| **Ass3** | -6 | 40 | 71 | 39 | 53 | 40 | 56 | 40 | 100 | 26 | 43 | 17 | 57 | 61 | 66 | 42 | 38 | 11 | 36 | 39 | 53 | 49 | **44,1** |
| **SPU/PA** | -1 | -4 | 32 | 42 | 37 | 39 | 7 | 11 | 26 | 100 | -13 | -17 | 17 | 21 | -3 | 21 | 32 | -17 | 14 | 24 | 44 | -17 | **18** |
| **MPEG** | 33 | 31 | 31 | -8 | 26 | 18 | 58 | 47 | 43 | -13 | 100 | 11 | 48 | 14 | 72 | 24 | -19 | 19 | 30 | 18 | -10 | 21 | **27** |
| **SESPA** | 6 | 29 | 43 | 14 | 16 | 20 | 48 | 18 | 17 | -17 | 11 | 100 | 4 | 41 | 28 | 53 | 26 | -12 | 41 | 34 | 26 | -19 | **24** |
| **Ass4** | 13 | 44 | 61 | 22 | 46 | 43 | 39 | 58 | 57 | 17 | 48 | 4 | 100 | 53 | 76 | 42 | 49 | 22 | 31 | 27 | 33 | 18 | **41** |
| **Ass5** | -24 | 39 | 76 | 30 | 49 | 63 | 54 | 26 | 61 | 21 | 14 | 41 | 53 | 100 | 50 | 56 | 63 | -3 | 50 | 54 | 51 | 20 | **42,9** |
| **Maracana** | 41 | 47 | 67 | 21 | 43 | 43 | 62 | 61 | 66 | -3 | 72 | 28 | 76 | 50 | 100 | 43 | 26 | 33 | 46 | 20 | 32 | 13 | **44,9** |
| **PT4** | 12 | 37 | 41 | 59 | 4 | 47 | 59 | 32 | 42 | 21 | 24 | 53 | 42 | 56 | 43 | 100 | 43 | -24 | 40 | 57 | 56 | 11 | **38,9** |
| **Vereador** | 1 | 53 | 59 | 56 | 27 | 38 | 18 | 3 | 38 | 32 | -19 | 26 | 49 | 63 | 26 | 43 | 100 | 24 | 28 | 57 | 69 | -1 | **35,9** |
| **DEMA** | 28 | 20 | 1 | -16 | -17 | -14 | -9 | 4 | 11 | -17 | 19 | -12 | 22 | -3 | 33 | -24 | 24 | 100 | -4 | 3 | 4 | 1 | **7** |
| **Ass6** | 7 | 27 | 49 | 22 | 39 | 58 | 66 | 31 | 36 | 14 | 30 | 41 | 31 | 50 | 46 | 40 | 28 | -4 | 100 | 29 | 30 | -12 | **34,5** |
| **Ass7** | -21 | 37 | 36 | 33 | 28 | 61 | 26 | 10 | 39 | 24 | 18 | 34 | 27 | 54 | 20 | 57 | 57 | 3 | 29 | 100 | 44 | 39 | **34,3** |
| **Ass8** | 28 | 51 | 53 | 73 | 31 | 53 | 30 | 37 | 53 | 44 | -10 | 26 | 33 | 51 | 32 | 56 | 69 | 4 | 30 | 44 | 100 | 13 | **41** |
| **SUATA** | -30 | -4 | 9 | -3 | 2 | 20 | 3 | 10 | 49 | -17 | 21 | -19 | 18 | 20 | 13 | 11 | -1 | 1 | -12 | 39 | 13 | 100 | **11** |
| **Sum** | **267** | **817** | **1052** | **681** | **724** | **865** | **894** | **745** | **971** | **395** | **594** | **527** | **903** | **944** | **987** | **855** | **790** | **154** | **758** | **755** | **901** | **243** | |

In consideration of an overall midpoint average (OMA) 32.69 in the Q sort correlation of the SD sorting, three stakeholder have been below the average, outside the stated acceptable variance of +24.52 (25% below the OMA): Police (7), SUATA (11.05), SEMA (12.14), SPU/PA (17.95), and SESPA (23.95). Looking for the same in the Environmental Justice sorting, considering an OMA of 22.00, four (4) stakeholders have been below the given variance of +16.50 (25% below OMA): SEMA (5), police (11.58), ORLA (13.79), and SPU/PA (14.47).

Table 11: Q Sort Correlation Matrix: Environmental Justice

| Sorts | SEMA | Ass1 | Ass2 | PT1 | ORLA | PT2 | GAF | PT3 | SPU/PA | Ass3 | Policia | Ass4 | Ass5 | Ass6 | Ass7 | Vereador | Ass8 | Maracana | SUATA | Sum |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SEMA** | 100 | -27 | 8 | 50 | 30 | 7 | 13 | -46 | 12 | 7 | -11 | 0 | -29 | -22 | -9 | -9 | -2 | 20 | 3 | **5,00** |
| **Ass1** | -27 | 100 | 17 | 16 | 9 | 36 | 24 | 31 | -1 | 56 | 30 | 32 | 70 | 69 | 37 | 32 | 47 | 23 | 40 | **33,74** |
| **Ass2** | 8 | 17 | 100 | -6 | -9 | 12 | 40 | 34 | -10 | 32 | -8 | -12 | -7 | 59 | 41 | 40 | 34 | 54 | 38 | **24,05** |
| **PT1** | 50 | 16 | -6 | 100 | -11 | 17 | 3 | -23 | 6 | 34 | 17 | 27 | 21 | -17 | 29 | 20 | 14 | -18 | -10 | **14,16** |
| **ORLA** | 30 | 9 | -9 | -11 | 100 | 51 | 16 | 20 | 34 | -1 | 34 | 6 | -23 | -2 | -30 | 9 | 14 | 8 | 7 | **13,79** |
| **PT2** | 7 | 36 | 12 | 17 | 51 | 100 | 7 | 32 | 32 | 41 | 39 | 36 | 14 | 21 | 29 | 81 | 43 | 10 | 19 | **33,00** |
| **GAF** | 13 | 24 | 40 | 3 | 16 | 7 | 100 | -17 | 36 | 43 | -17 | -24 | -1 | 44 | 16 | 0 | 32 | 71 | 49 | **22,89** |
| **PT3** | -46 | 31 | 34 | -23 | 20 | 32 | -17 | 100 | 8 | 13 | 21 | 20 | 24 | 34 | 36 | 47 | 18 | -11 | -9 | **17,47** |
| **SPU/PA** | 12 | -1 | -10 | 6 | 34 | 32 | 36 | 8 | 100 | 9 | -36 | 6 | 10 | 17 | 7 | 6 | 9 | 38 | -8 | **14,47** |
| **Ass3** | 7 | 56 | 32 | 34 | -1 | 41 | 43 | 13 | 9 | 100 | 22 | 30 | 37 | 57 | 72 | 46 | 77 | 21 | 52 | **39,37** |
| **DEMA** | -11 | 30 | -8 | 17 | 34 | 39 | -17 | 21 | -36 | 22 | 100 | 23 | 3 | 3 | -7 | 28 | 24 | -39 | -6 | **11,58** |
| **Ass4** | 0 | 32 | -12 | 27 | 6 | 36 | -24 | 20 | 6 | 30 | 23 | 100 | 52 | 2 | 22 | 49 | 41 | -29 | -16 | **19,21** |
| **Ass5** | -29 | 70 | -7 | 21 | -23 | 14 | -1 | 24 | 10 | 37 | 3 | 52 | 100 | 39 | 30 | 33 | 29 | 7 | -4 | **21,32** |
| **Ass6** | -22 | 69 | 59 | -17 | -2 | 21 | 44 | 34 | 17 | 57 | 3 | 2 | 39 | 100 | 51 | 24 | 46 | 54 | 43 | **32,74** |
| **Ass7** | -9 | 37 | 41 | 29 | -30 | 29 | 16 | 36 | 7 | 72 | -7 | 22 | 30 | 51 | 100 | 50 | 48 | 0 | 12 | **28,11** |
| **Vereador** | -9 | 32 | 40 | 20 | 9 | 81 | 0 | 47 | 6 | 46 | 28 | 49 | 33 | 24 | 50 | 100 | 46 | 4 | 11 | **32,47** |
| **Ass8** | -2 | 47 | 34 | 14 | 14 | 43 | 32 | 18 | 9 | 77 | 24 | 41 | 29 | 46 | 48 | 46 | 100 | 18 | 38 | **35,58** |
| **Maracana** | 20 | 23 | 54 | -18 | 8 | 10 | 71 | -11 | 38 | 21 | -39 | -29 | 7 | 54 | 0 | 4 | 18 | 100 | 59 | **20,53** |
| **SUATA** | 3 | 40 | 38 | -10 | 7 | 19 | 49 | -9 | -8 | 52 | -6 | -16 | -4 | 43 | 12 | 11 | 38 | 59 | 100 | **22,00** |
| **SUM** | **95** | **641** | **457** | **269** | **262** | **627** | **435** | **332** | **275** | **748** | **220** | **365** | **405** | **622** | **534** | **617** | **676** | **390** | **418** | |

For all these stakeholders can be said, that the geographic 'distant' problem is apparent: All named sorts, which are below the defined variance of OMA and appear in both sets (police, SEMA, SPU/PA), are governmental institutions. All of these aren't mainly located on Algodoal, but in Belém[23].

Remaining sorts just appear in one set, SESPA and SUATA in the Sustainable Development sorting and ORLA in the environmental justice sorting.

*Interpretation*

The secretary of state and public health (SESPA) is closest to the OMA, and focuses by job description on health rather than on environmental issues or questions of Sustainable Development. Most important aspect are the living conditions of the SESPA representative: He is one of the few, living on the APA, who has a fix good salary which excludes him from many day by day problems faced by the others. Another aspect is, that – as people told – he is travelling a lot as part of his work, and therefore his problem perception is not that close to community's day by day activity.

The second sort is the NGO SUATÁ. This NGO is – in opposite to GAF, which was founded and (mainly) located in village Fortalezinha on island Maiandeua (Kaufmann 2003: 82, Quaresma 2000: 166) - based in Belém like the SEMA, and has strong legal emphasis since its president is an environmental lawyer. It is relevant to mention that this NGO has a midpoint (11.05) of just 30% of the Fortalezinha based NGO GAF (33.86); furthermore, the understanding of SD on Algodoal differs strongly related to the politically and legislatively powerful SEMA. Whilst SUATÁ and SEMA have very few in common (-30), the GAF-SEMA correlation shows a much more congruent

23 This is just partly true in regards to the mentioned police officers. The time one certain officer holds a position on the APA, he is located on the island, but they are exchanged all two weeks.

perspective in this regard (+24). Nevertheless, SEMA and SUATÁ are far from seeing the SD problem like inhabitant participants do, but – between the two institutional bodies – emphasize obviously different arguments. Comparing the midpoints of both GAF and SUATA with their correlation in between (+10), one can clearly see that SUATÁ agrees to the same extent with GAF as to all others at an average, but GAF is 23.86 points below its own midpoint (33.86).

Generally strong congruency between SUATÁ and SEMA would have been expected, since they are both located in Belém, since they are most likely sharing a similar 'urban' view on the problem of development and sustainability in APA Algodoal, and since both representatives come from an institutional perspective emphasizing legal proceeding. But the data tell the contrary: SEMA and SUATÁ have less in common than each one has in common with each other single sort. They have more in common with each other sort in the panel than they have with each other. They share[24] a similar average midpoint of 12.14 (SEMA) and 11.05 (SUATÁ), but their difference to the other sorts obviously results from different viewpoints and isn't caused by similar opinion.

Looking at the EJ Q sort correlation then, one can find some possible evidence for this correlation. The SEMA is at the absolute bottom of any congruency with the other sorts and 17 points below the OMA, whilst SUATÁ's midpoint is equal to the OMA. Even though, in this correlation neither disagreement can be found, but no agreement (+3). None of the two is coming from the grassroots and both are working within law institutions, but both agree to some others less than to each other, in opposite to the result of the SD Q sort correlation as mentioned.

In the EJ Q sort correlation's variance, ORLA's response shows (negative) variance just in this sort, not – as it superior agent of the SPU/PA – in both Q sort correlations. ORLA and SPU/PA have a similar non-congruence to the OMA in the field (difference between 8 and 9 below the OMA), varying at 0.68. When looking for the correlation of the two sorts in the responsible sorting, some evidence can be found, since the Q sort correlation between these two (+34) in the Environmental Justice set is about twenty points above the midpoint of each (SPU/PA 14.47; ORLA 13.79). This means that they agree much more with each other than they agree with the other sorts at an average. The significance of this issue is due to SPU/PA's low congruency of 25% below the OMA in both discourses. This must not be overestimated, since both Q sort correlations mainly base on its lack of regional knowledge and is not able to explain any distance problem of perspective[25]. In fact, ORLA has much more inside knowledge than the SPU/PA. First of all about the mentioned land ownership problem: ORLA expressed in free qualitative conversations no sympathy to self-inflicted social

24 They also share consequentially the same variance below the OMA of 20.55 (SEMA) and 21.64 (SUATÁ).

25 There is to consider that the understanding of both Sustainable Development and Environmental Justice was specifically asked in relation to field Algodoal-Maiandeua.

problems caused by illegal land taking.[26] The expressed individual responsibility[27] for illegal land selling by natives there, which at the end also legitimates illegal buying of land, is in accordance with typical urban, western centred rationality and understanding of legal action responsibility. Here, the cultural distance problem becomes evident as consequence of the geographic distance problem set. Anyhow, this argument as such is too simple. When looking at the SD Q sort correlation, ORLA shows the highest average congruence in understanding of Sustainable Development in the field, compared with all other sorts. Its pole position (+47.82) to all other sorts (sic!) is 15 points above the OMA (+32.69) whilst SPU/PA's midpoint is 15 points below (+17.95). The insight view of ORLA obviously makes a strong difference in the perspective on the Sustainable Development matter on Algodoal, so a congruent viewpoint by both cannot be found in the empirical data. The two have as much in common (+32) as all sorts have in common with all other sorts in the set (OMA +32.69).

Finally, a few words now about the low congruence section of both sets: SPU/PA, SEMA and Police. The SPU/PA is – beside the SEMA – the highest agent of the governmental body in federal state of Pará, but himself rather indirectly confronted with the local problems on islands Algodoal-Maiandeua, so this appearance doesn't surprise. Furthermore, since SPU/PA itself isn't represented in the management council, as argued above, more explaining are the results in regards to the SEMA and the Police as Q sorts. In the Environmental Justice (EJ) set the two Q sorts disagree to each other (-11) whilst in the Sustainable Development (SD) set (+28). Furthermore, one must take in consideration, that the police sort's midpoint in the SD set is the lowest of all (+7.0) whereas the SEMA 'just' holds the third weakest position (+12.14) after the SUATÁ (+11.05) as mentioned. Lowest agreement position of all in the EJ set is hold by the SEMA (+5), in which police has second lowest position (+11.58). Disagreement between the two is 16 points below the average midpoint shared by the SEMA towards all other sorts in the set and 22.58 below that, what the police sort has in common with all others at an average. Beside the mentioned fact of geographic distance as measurable factor for relevant institutions, the position of police and SEMA in both sets show not a culturally completely different viewpoint on the problem set, but reveals the crux in the institutional structure: Both legislative (SEMA) and executive (police) in the environmental protected area have a more difference in seeing the problem set than the people which live there. Considering the initially stated problem of environmental law implementation, the examination could give evidence for this difference in problem perception. So, the second hypothesis can be

26 I asked, whether illegal land taking on Algodoal in the past will be undone by the SPU/PA when a management plan is established.
27 and therefore the neglect of governmental responsibility for this problem

confirmed: The APA law on Algodoal-Maiandeua fails since the problem set is understood to differently by those implementing (SEMA) and monitoring (police) the regulation, and those which shall live in accordance to the law.

Conclusion and final considerations

Finally, one can conclude, that Q methodological results could show, that, within the given frame of given statements in the given field with the given P-set(s), discourses have been more distinctive in the EJ set than in the SD set. Basing on the assumption that each statement sample is capable to represent the range of discourses in the field, the division of significant statement differences in the PCA comparison gave evidence for validity of the first hypothesis. This evidence is supported by demonstrated existence (SD set) and non-existence (EJ set) of consensus statements.

The proof of the second hypothesis is of higher practical importance. As the examination could show, the closer stakeholders are geographically to APA Algodoal, not in general, the more they have in common with the local stakeholders. This very simple truth is plausible by logic, but proof by Q sort correlation revealed the geographical distance problem as obstacle of successful law implementation on APA Algodoal, and discourse narratives could show the relevant, missing debate topic for further processing beside of the structural, participation problem. The results presented highest difference between executive and legislative on the one hand and the local population on the other hand. Unexpected discovery is in assessable 'distant' degree between institutions too, namely the SUATA and the SEMA.

The result of the two Q analyses can be suitably placed within Elvers's process related research paradigm. Within the circle of analysis and implementation, Q analysis could provide a better understanding of the local situation by looking at the different discourses. The knowledge of antagonistic perspectives in the field, in particular in regards to controversial concepts as Sustainable Development and environmental justice, can improve further debates in the management council very practical, if considered.

Furthermore, the results reveal opportunity and need to include continuing Q studies in further processing for creation of an all-accepted development plan on island Algodoal-Maiandeua. Beside consideration of demonstrated discourses, the problem of less indigenous representation in the management council must be taken into account from institutional side, namely the SEMA to provide a management plan that finally can consider their viewpoint when approaching the landownership problem as underestimated environmental concern in the field.

Finally, some remarks to the scope of statements, made in this study, and theoretically perspective.

Restrictively must be considered, that one person, as the questioned police man, cannot give generalizable answers. Same is true for the SEMA, since one representative cannot decide alone or might probably express not just the institution's opinion, but her own opinion too etc. On the other hand, the police officer or agent of the SEMA may have just expressed their opinion in a specific moment and therefore aren't representative for the whole institution, but this limitation is due to Q methodology's nature of looking for what distinguishes opinions of sorts than for analysing what they have in common. Consequentially, no correlation of factor analysis in this piece can be seen as representative for any of the mentioned stakeholder groups. Furthermore, the usage of general concepts, such as Sustainable Development and Environmental Justice, handed possibility to the representatives to link the question to what they perceive as their area of duty in the field.

Another limiting, but unavoidable, methodological bias is the difference of the two statement sets. Even more, their selection and reduction in the concourse matrix based on qualitative, interpretative causalities which hardly create approximately similar standards for the discourse set. On the other hand, the Q methodological interpretation must be understood within a 6 months field research, long term qualitative conversations and discussions with the involved stakeholders. The results have been interpreted together with the leading organ at a non-public convention of SEMA functionaries and furthermore debated with scientific experts of Federal University of Pará (UFPA) for the field to minimize the bias. Therefore, I assume, valid interpretations could be drawn from the examination. At the end, there is to say, that this publication is just one part of the field research presented in the PhD thesis (Kaufmann 2012). Consequentially, not all arguments could have been fully discussed.

For theoretical perspective is to conclude that providing equal chances for participation is a distribution matter and central for the new paradigm in environmental sociology: Environmental Justice. In this study, Q methodology could prove its value and contribution to this red-hot topic for environmental social sciences. EJ is a concept in struggle, which bares the most relevant question in the environmental problem: Development for whom? Development for what? In this scope, sustainable discourses on Algodoal must be seen, analysed and discussed. Herein position must be taken.

# Appendix

Normalized factor scores for each factor in the SD set

| No | Statements/Discourses (Normalized factor score/statement totals) | A | B | C | D |
|---|---|---|---|---|---|
| 1 | Result of the sustainable development process is a community focused on consumption. | -1/-0.18 | +1/0.19 | -1/-0.51 | +1/+0.31 |
| 2 | Necessary be a type of institutional innovation to replace economical rationality by a new and distinct cultural rationality. | -1/-0.42 | +2/+0.94 | +2/+0.72 | -1/+0.18 |
| 3 | Economical growth is a positive force, which eliminates social disparities for irrelevant ecological costs. | -3/-1.36 | 0/-0.08 | -4/-2.44 | +2/+0.86 |
| 4 | The environment is the absolute limit to economical growth. Therefore, mankind is close to catastrophe. | 0/-0.05 | +2/+1.35 | 0/+0.20 | -2/-0.64 |
| 5 | Technical progress effectively relativizes the environmental limits. | -2/-0.98 | 0/-0.20 | -1/-0.06 | +1/+0.40 |
| 6 | The environmental problem could be resolved by enduring intervention of public authority, with instruments of control and command. | 0/-0.14 | +3/+1.38 | +3/+1.15 | 0/+0.26 |
| 7 | Due to the existence of absolute limits, economical growth mus stop at some point. | +2/+1.09 | -1/-0.75 | -2/-0.72 | -3/-1.37 |
| 8 | Anthropocentrism increased in the last years, representing a negative change in the mentality. | +2/+0.68 | -1/-0.58 | -3/-1.29 | -1/-0.61 |
| 9 | Development (economical growth) on island Algodoal-Maiandeua is accompanied by a increasing felicity of the persons. | +1/0.30 | -1/-0.53 | +1/+0.38 | 0/+0.21 |
| 10 | Sustainable Development is the equilibrium (without priorities) of economical (tourism) and environmental development. | 0/-0.08 | +4/+1.58 | -3/-1.10 | 0/+0.18 |
| 11 | The major goal to better the process of sustainable development and the *status quo* of environmental justice is environmental education for the traditional population, which be much more effective when all governmental projects would work together. | +4/+1.59 | +3/+1.47 | 0/+0.13 | +2/+0.60 |
| 12 | Contemporary tourism is the solution to develop island Algodoal-Maiandeua. | -3/-1.15 | -2/-0.77 | +1/+0.59 | -1/-0.51 |
| 13 | Drug abuse on Algodoal is an impact of human development. | +1/+0.49 | -3/-1.27 | +3/+1.29 | +3/+1.06 |
| 14 | Prostitution is an impact of present sustainable development on Algodoal-Maiandeua. | -2/-0.98 | -3/-1.12 | +2/+0.66 | -2/-1.01 |
| 15 | The development problem is that the natives don't accept persons from outside that come to Algodoal-Maiandeua, even though these people are living there since more than 20 (twenty) years. | +1/+0.49 | -2/-1.03 | 0/+0.37 | -3/-1.55 |
| 16 | Sustainable Development means to return to production (fishing for example) and culture of the Indians. | +3/+1.57 | +1/+0.45 | +1/+0.51 | +4/+1.89 |
| 17 | The development plan must be created by the inhabitants not by superior government. | +3/+1.44 | 0/+0.09 | -2/-1.09 | +3/+1.34 |
| 18 | Because of Sustainable Development I have more options, more liberty and a better well-being [in my socio-economical life]. | -1/-0.57 | +1/+0.48 | +4/+1.50 | +1/+0.28 |
| 19 | The only thing that I am missing on Algodoal-Maiandeua are cars. | -4/-1.75 | -4/-1.58 | -1/-0.28 | -4/-1.88 |

Normalized factor scores for each factor in the EJ set

| No | Statements/Discourses (Normalized factor score/statement totals) | A | B | C | D |
|---|---|---|---|---|---|
| 1 | It's not the nature of humans to want more and more money. | -1/-0.25 | -2/-1.17 | +1/+0.77 | -4/-2.11 |
| 2 | The government has to take more responsibility to create a better environmental legislation than actual are. | +3/+1.30 | 0/+0.03 | -1/-0.08 | +2/+0.83 |
| 3 | The poor are both victims and causers of environmental damage. | -2/-1.06 | +2/+0.93 | -3/-1.85 | -1/-0.25 |
| 4 | Sustainable Development is defined by satisfying the necessities of the presence, without sacrificing the needs of future generations. | +1/+0.16 | +1/+0.41 | -2/-0.90 | +3/+1.25 |
| 5 | Institutions cannot solve the environmental question. | -3/-1.07 | -3/-1.72 | +1/+0.28 | +2/+0.90 |
| 6 | Solution for the environmental question be protests of civil society. | 0/+0.07 | +1/+0.39 | 0/-0.03 | -2/-0.74 |
| 7 | The costs of development are payed by the poor or non-white people or by future generations. | -2/-0.68 | +2/+0.79 | -1/-0.26 | -1/-0.60 |
| 8 | The biggest problem isn't the depletability of resources but the consequences of their usage. | 0/-0.20 | 0/+0.21 | +2/+0.86 | +1/+0.44 |
| 9 | To understand sustainable development it is necessary to consider regional specifics, ideas of human repect, deep knowledge and love to nature. | +3/+1.15 | +1/+0.31 | +4/+1.57 | -2/-0.87 |
| 10 | In the past, work relations and relationship to the natural resources based on communitarian rights. Environmental Justice means to re-consider the antique understanding. | +1/+0.44 | -2/-0.61 | +3/+1.40 | +4/+1.98 |
| 11 | Development on island Algodoal-Maiandeua is efficient and produces environmental justice. | -4/-1.74 | -4/-1.82 | -1/-0.55 | -3/-1.08 |
| 12 | The failure of environmental justice and sustainable development on Algodoal is significant due to cases of malaria and yellow fever. | -1/-0.35 | +3/+1.18 | 0/+0.15 | -3/-1.10 |
| 13 | There are many cases of illegal buying, selling, and ownership of land. Environmental Justice means to finish this illegal possession. | +1/+0.46 | -1/-0.07 | 0/+0.16 | -1/-0.62 |
| 14 | Environmental Justice means monitorization of enterprises to provide better environmental services. | +2/+0.76 | -1/-0.16 | -2/-0.80 | +1/+0.78 |
| 15 | The problem lies in under-representation of the Indians in the participation organs, which are culturally marginalized. | -1/-0.27 | +3/+1.35 | +1/+0.53 | +3/+1.12 |
| 16 | The institutions of the government don't know the needs of the traditional population on island Algodoal-Maiandeua. | 0/-0.25 | -3/-1.48 | -3/-1.08 | 0/-0.03 |
| 17 | The influence of the different stakeholders on island Algodoal-Maiandeua differes in accordance to their economical power, this fair since it is the salary of success. | -3/-1.45 | -1/-0.20 | +3/+0.98 | 0/+0.11 |
| 18 | The majority of people don't have the opportunity to partake the environmental goods and suffer overproportionally. The conflict emerging from this situation must not be ignored (anymore). | +2/+0.68 | +4/+1.60 | +2/+0.82 | +1/+0.16 |
| 19 | Waste is the major problem in the APA Algodoal-Maiandeua. | +4/+2.29 | 0/+0.04 | -4/-1.95 | 0/-0.15 |

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## Abbreviations

ACDESPIM: >Associação Comunitária do DESenvolvimento e Preservação da Ilha de Maiandeua-algodoal< [Common Association of Development and Preservation of Island Maiandeua-Algodoal]

ACPAVA: >Associaçâo Comunitária Pescadores Artesanais da Vila de Algodoal< [Common Artesan Fishermen Association of village Algodoal]

AETA: >Associação de Empreendedores de Turismo de Algodoal< [Association of Entrepreneurs of Tourism on Algodoal]

ALMA: >Associação dos Lancheiros Marudá-Algodoal< [Association of food sellers Marudá-Algodoal]

APA: Área de Proteção Ambiental [environmental protection area]

Ass: Associação [Association]

CLIMAM: >Cooperativa dos Lancheiros da ilha de Algodoal – Marudá< [Cooperative of food sellers on island Marudá-Algodoal]

DEMA: >Delegacia Especializada em Crimes contra o Meio Ambiente< [specialized delegacy on crimes against the environment]

EJ: Environmental Justice

GAF: >Grupo Ambiental de Fortalezinha< [Environmental Group in Fortalezinha]

GEMA: >Grupo Ecológico Maiandeua< [Ecological Group Maiandeua]

IBAMA: >Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais< [Brazilian Institute of Environment and Renewable Natural Resources]

MPEG: >Museu Paraense Emílio Goeldi< [Museum of Pará Emílio Goeldi]

NGO: Non-Governmental Organization

OMA: Overall Midpoint Average

ORLA: >O Projeto de Gestão Integrada da Orla Marítima< [the project of integrated management of maritime margin]

PARATUR: official tourism organ in the state Pará

PCA: Principle Component Analysis

PT: >População Tradicional< [Traditional Population]

SD: Sustainable Development

SEMA: >Secretaria do Meio Ambiente< [state's secretary of the environment]

SESPA: >Secretaria de Estado e Saúde Pública< [secretary of state and public health]

SPU/PA: >Superintendência de Patrimônio da União no Estado do Pará< [Superintendent of Heritage Union in the State of Pará]

SUATÁ: >Associação Pró-Ilha de Algodoal-Maiandeua< [Association Pro-Island of Algodoal-Maiandeua]

UFPA: >Universidade Federal do Pará< [Federal University of Pará]

Vereador: mayor