Policy Actor's Discourses and Interactions Coalitions on the Climate Mitigation and Adaptation Domains - A Brazilian Case Study.

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Abstract

Transformations towards effective and righteous climate policies, institutions and actions require coherent policies on climate change mitigation and adaptation, from global to local level. In Brazil, most of the GHG emissions come from changes in land use and from the agriculture and livestock sectors. Agro systems and natural systems such forests are connected when we think about climate change mitigation and adaptation strategies and both systems have a key role in supporting transformation towards resilient social-ecological systems.

We present a case-study analysis on the Brazilian climate change policy process related to forest, agriculture and livestock. The paper is based on a mix-method approach combining social network analysis (Wasserman and Faust 1994, Scott 2000, Borgatti, Everett and Johnson 2013) and discourse network analysis (Leifeld, 2013) to understand the arrangement of actors according to their discourses and beliefs and according to their interactions with other actors in the climate change policy domain. Our objective is to understand the relationship between discourse and interaction – information exchange and collaboration – networks and how this combination is likely to produce an effect on the policy process towards transformation in the mitigation and adaptation policies in Brazil. The case-study is a result of analysis of 105 interviews gathered in 2014 and 2015, with policy actors from distinct sectors in Brazil.

Introduction

International debate spaces and agreements such the United Nations Framework Convention on Climate Change (UNFCCC) have been triggering domestic policy changes in the signatory countries. In 2009, during the COP-15 in Copenhagen, Brazil stated a voluntary commitment to reduce its emissions in up to 39% by 2020 (comparing to a 2005 baseline). The commitment was sealed by core policy instruments - the national policy and plan on climate change. The national policy on climate change, an umbrella policy instrument, amalgams different general strategies to fight the climate change consequences and to contribute with the global effort to reduce GHG emissions. Although climate change policy instruments have been pushed since 2009, a set of actors arrangements have been created since 1999 to devote efforts on fighting climate change. The main actors' bodies with specific climate change duties are the Inter-Ministerial Committee on Climate Change (CIM) and its executive group (Gex), the Inter-ministerial Commission on Climate Change (CIMGC), the Brazilian Forum on Climate Change (FBMC), the Brazilian Network on Climate Change Research (Rede Clima), and the Brazilian Commission for Coordination of Meteorological, Climatological and Hydrological Activities. Climate change concerns spread in the Brazilian society, whether by the consequences of the climate change itself, such extreme events, whether for the productive and structural activities that is changing or will produce changes in the national economy and emissions patterns. Those consequences and changes expected from the climate change debate from global to local attracted different actors to the climate change policy domain that struggles on making deep changes in the domestic policies or keep the status quo of business as usual regarding strictly climate change and climate change related issues.

This new context have been producing institutional policy changes in Brazil, even though to understand the policy arena and the coalitions formation in this policy process still deserve

more attention and analysis. Consider, for instance, the climate change subject in the broader context of the Brazilian INDC commitment. Any national policy that will try to achieve the internationally proposed pledge has a long way through, as establishing institutions to fight climate change might not be the first priority or interest of decision makers in a long term, or it can fade in the changes in mandates. Climate Change policy-making, as any other issue network in the policy process, is a policy domain formed by different societal and political actors (Börzel 1998, Adam and Kriesi 2007) who attempt to influence the policy structures, arrangements and outcomes, although the decision-making process is still made by a close set of actors. This is particular visible in the land use and land use change domain where organizations from agribusiness, energy, environmental and human rights actors struggle to influence whether the directions of the Brazilian's general approach to fight climate change, or particular instruments regarding land use and land use change.

The political science encompasses a diversified body of theories on political discourses or actor-oriented approaches to political discourses (Leifeld 2012) to understand influence and change. It comprises as well the policy network approach, understood as variates of networks that reflects the formal and informal linkages amongst state and non-state actors, and their interdependencies in the policy process (Rhodes 2006). However, few studies have been trying to connect discourses to the actors who frame them (Steensland 2008), whereas those who attempted to do it claim that the combined approaches produce extra insights than a single approach (Leifeld 20122, Galey and Youngs 2014).

We performed an empirical policy network study, using formal methods of social as an indicator of coalitions through network interactions amongst policy actors in the climate change arena. Clusters emerges when a community structure detection method is applied to the data and splits the actors in the network in distinct groups which have high linkages inside the groups comparatively with few linkages between groups (Fortunato 2010), so the difference in the interaction densities split the network in subgroups. We also carried on a qualitative analysis of most central actors' discourses to understand how discourses are distributed in the network subgroups found through community analysis. We then combined social network analysis with discourse analysis to understand if and how discourses are shared in the same faction and what that means for the climate change coalitions formation in Brazil. Next steps comprise performing a complete discourse network analysis to understand if there is polarization in the adaptation and mitigation climate change policy process and where central actors are positioned in polarized groups.

Subgroup analysis are useful to understand coalitions, as a more closed or cohesive structure might be associated with the subgroup power or its collaborative nature (Lubell et al 2012). On the other hand Hajer (1997) affirms that discourse coalitions do not need or imply necessarily interaction, although it is well known that likeminded people and organizations tend to share information around an issue of interest. Yet, the density of ties amongst members in a network or inside subgroups might either indicate instrumental or strong alliances (Di Gregorio 2012). We combine policy network analysis, using cluster analysis method, with discourse analysis to understand coalition formation in the climate change domain in Brazil.

Case Study Characterization

Emissions sources, Climate Change Impacts and Institutional and Policy Architecture in Brazil
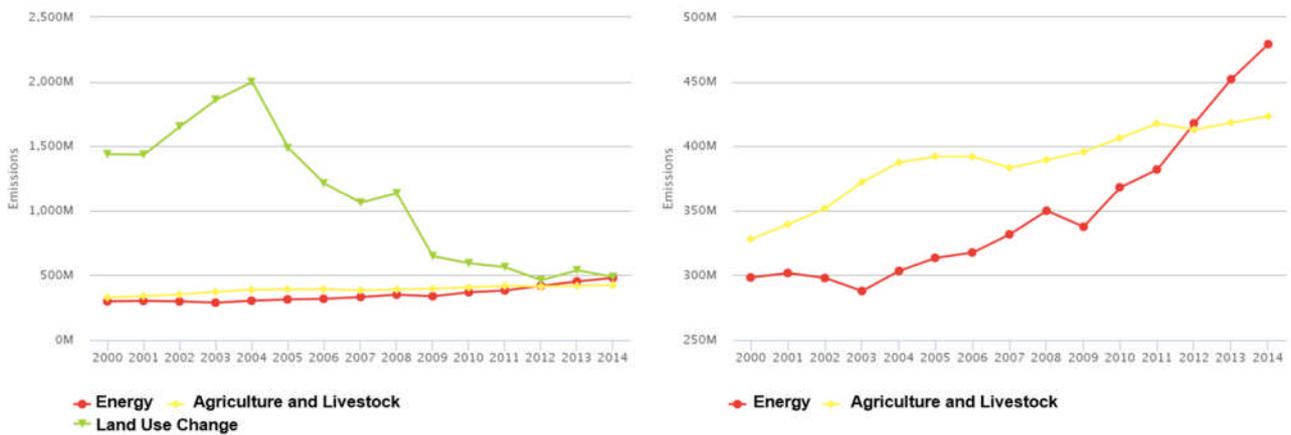
Brazil have been considered a reference in fighting deforestation, which in turn, had reduced largely the country emissions regarding land use cover change. The numbers shows a significant drop in the deforestation rates since 2004 (SAAEG 2014, Prodes, TCN 2016). Although the overall deforestation rates have been constantly decreasing up to 2012, we should not judge this as a stable or lasting scenario, as the last analysis shows a slight increase in those rates in the last years, and in any year but mainly in 2013 and 2015, we were far from the 2012 rates (Prodes 2016). In the agriculture and livestock sector, we observe a pattern of increment of emissions, year by year, and according with the Brazilian Emissions Inventory (TCN 2016), in 2010 the agriculture and livestock sector was responsible for the most part of the country emissions.

The attempt to limit the global average temperature increasing up to 1.5° C, as stated in the new Paris Agreement (COP21) is already in risk of non-accomplishment because of the gap between countries pledges (declared in the Intended Nationally Determined Contributions (INDCs)) and their fair share (CERP 2015). Brazil presented an INDC that is a little bit more than two third of its fair share (CERP 2015) and indicates that the country has to find an extra breath to push further the mitigation measures.

On the side of the consequences, the impact of climate change have been assessed through some efforts in the country. The main initiatives trying to estimate and gather evidences of climate change impacts in Brazil are: the report "Impacts, Vulnerability and Adaptation" (PBMC 2013), from the Working Group 2 of the Brazilian Panel on Climate Change (the domestic analogous to the IPCC); the study "Brazil 2040 – Alternatives for Climate Change Adaptation" executed by the extinct Strategic Affairs Secretariat of the Presidency (SAE 2015); the "National Plan on Adaptation", a document that is still in draft version (MMA 2015); and the "Third National Communication" launched in 2016 (TNC 2016). Generally speaking, impact forecast for a scenario of global warming in Brazil include changes in temperature and precipitation patterns. This will put in risk the subsistence and commercial agriculture production, changing the distribution of suitable cropland, decreasing in the water availability, impacts in the water regime, increasing in the occurrence of extreme events, extinction or changes in the distribution of animal and plant species over the territory, with a shrinking of forest habitats distribution and the expansion of open formations and savannas (PBMC 2013, National Plan on Adaptation 2015; TNC 2016).

In order to put in place the mitigation commitments stated in the iNDC, and in order to develop adaptation options to cope with climate change impacts in the land use and land use cover change domains, Brazil has established some instruments. The major instruments are the National Plan and Policy on Climate Change (Brazil 2008, 2009), the Action Plan for the Prevention and Control of Deforestation in the Legal Amazon (PPCDAm), the Action Plan for the Prevention and Control of Deforestation and Burning in Cerrado (PPCerrado), the Rural Environmental Registry (CAR) associated with the Forest Code, the REDD+ strategy, the Sectoral Plan for the Mitigation and Adaptation to Climate Change for a Low-Carbon Emission Agriculture (ABC Plan), The National Action Program to Fight Desertification and Mitigate the Effects of Drought (PAN), and the National Plan on Adaptation (PNA). Yet, some of those instruments are umbrella instruments that try to bridge other existing policies that contribute to achieve objectives of the climate change policy and plan.

Estimates of Brazilian Emissions CO$_2$e (t GWP)

Source: SEEG (Greenhouse Gas Emission Estimate System). 2016. http://plataforma.seeg. eco.br/total_emission

Coalitions and Discourses

Amongst the theories that tries to explain policy process over time, two of them have been considered competing views when we talk about environmental problems: the Advocacy Coalition Framework, also known as ACF (Sabatier and Jenkins 1988), and the Discourse Coalitions (Hajer 1993).

The ACF defines policy coalitions groups of individuals, or participants in a policy subsystem, that share interests, cognitive beliefs and worldviews. Dominant coalition is one that achieved convert believes into a public policy, through coordinated actions (Weible and Sabatier 2006) - favoured by the internal coalition set, such as the learning process, and by the societal context (stable parameters and external events) (Sabatier and Jenkins 1988). In another way, the Discourse Coalition explains the policy change through storylines, or discursive structures that define what are the problems to be solved and also which are the options to do it (Hajer 1993). The winner discourse will be reproduced by institutions (Hajer 1993),

Both theories can be analysed together under the policy network approach (Bulkeley 2000), as actors who share similar ideas would tend to attach to each other, and then when they are stick together they would seek the advocacy process of advocacy of their ideas (Leifeld 2011). Rather than opposing ACF and Discourse coalitions, we believe that combining them in an empirical study might shed a light on the climate change coalitions formation in Brazil.

Methods

The case study took place in Brazil, and it was designed as a multi-level investigation, which means that our focus of analysis is on interactions and discourses of actors of the climate change domain in the national, state and municipality levels all together. The Mato Grosso state was chosen for this multilevel design because it is the largest soya, corn, cotton and beef producer state in Brazil, it embraces three different biomes – Amazonia, Cerrado and Pantanal, and in recent years its deforestation rates start increasing again, breaking a consecutive annual reduction in emission reduction since 2009 (Prodes 2016).

We performed structural interviews with 125 societal or political actors of which 105 also answered a semi-structured questionnaire, and this smaller population is object of this study. During the interview, we asked: i) what are the major climate change problems in Brazil or in the Mato Grosso state; ii) what are the country's priorities on adaptation and mitigation. From the interview, we could also identify general actors' understanding of adaptation. As adaptation is a relatively new policy object in Brazil, we decided to include the understanding of adaptation in the analysis. The structured questionnaire consisted, amongst other questions, of a network survey. The network data refers to communication and collaboration interactions of an interviewed organization with others societal and political actors of a previously defined climate change policy network. This policy network was set based on previous policy network studies on mitigation (Gebara et al 2014), on a literature review and media review about mitigation and adaptation policy process and actions in Brazil, and on an expert panel meeting that helped us to define the boundaries of the climate change policy network for this study. For this work we are considering only the communication interactions amongst actors in the mitigation and adaptation policy domains.

Analysis

Network data

All the information of actors' interactions about information exchanges on mitigation and adaptation issues was compiled in an actor by actor matrix and analysed in the UCINET software (Borgatti, Everett and Freeman 2002). First of all, we transformed the valued network (the sum of mitigation and adaptation communication networks) into a binary network, where any value different than zero was considered as a linkage between actors. We performed a faction (subgroup) analysis using the Hamming distance, a hierarchical clustering method that measure similarity between two actors in the network.

The subgroups where characterized according to its composition, such as the actors' category, level of administrative division, and on their declared climate change efforts. Here, we classified actor in five types: a) "mitigation" refers to actors specialists on mitigation (the majority of declared efforts is in mitigation actions); b) "adaptation" refers to actors specialists in adaptation; c) "integrated" label is associated to those actors who does considerable efforts in mitigation and adaptation domains; d) "both" applies to actors who does efforts in mitigation and adaptation domains, but as a secondary goal; e) "non-climate" includes actors who do not have main goals or actions around mitigation or adaptation. One example is the Ministry of Finance, who is an actor in the climate change domain but whose major activities are not related to the issue.

After portraying the subgroups, we identified the most prominent actors in each group using the *indegree* centrality measure (Freeman 1975, Scott 2000), which scores actors according to their number of direct links to other actors in the network. We summed up the indegree scores of each actor for mitigation and adaptation communication networks, creating an index for the climate change domain in Brazil that capture the popularity of an actor in those networks. Dialogue networks are a key element in the management and governance of social-ecological systems (Olsson et al 2004) for transformational change, and it can be a space for sharing discourses, understanding of problems, language and concepts, and solve conflicts (Armitage et al 2008, Bodin and Crona 2009, Dawes et al 2009) Most central actors in the network might have an impact on how the discourses spread in the whole network.

Discourse data

After having characterized the subgroups and identified central actors, we analysed the discourses of some actors from each subgroup. We chose the organizations for this analysis based on their popularity index, their centrality inside their groups, or based in actors' formal institutional power. We use a content-oriented discourse method (Leifeld 2011) to similarity and differences on discourses of actors in the same subgroup. We coded and analysed the interviews using the QSR International's NVivo 10 qualitative data analysis Software. We concentrate our analysis on the actor's position about what constitute the main climate change problems in the country, their general conceptions about adaptation, and what should be the mitigation and adaptation priorities, in the country or in the state.

Results

The subgroup analysis resulted in six dense subgroups (Figure 2). The full characterization of the groups are described in the Table 1. We have four groups with majority of actors from national level, and two groups from subnational level: one formed by state level actors, with most of actors from business sector; and other formed by the majority of actors from the two municipalities. Atop of the network partition into the three administrative levels, the national level groups were split in four groups. We called "Climate Change" the biggest group. This group encloses the majority of ministries and state agencies and we found a relative balance between the number mitigation and adaptation specialists and the actors with a marginal or no efforts on climate change domain. We observe the highest reputational power scores in this group.

The "Non-Government Mitigation" group is formed by a majority of environmental non-profit organizations, but encloses as well actors from the business sector, research institutions and one government actor. The "Non-Government Adaptation" group is constituted by organizations working on environmental justice, indigenous or small scale livelihoods issues, with no dominance of any climate effort. The "Forests" group is formed by actors working closely to forests and biodiversity issues, and there is no dominance of one type of climate effort over the other. We identified a seventh group of actors that we decided to drop out from the analysis because they have more linkages outside the group than inside, and this disqualify them as a possible coalition.

The analysis of organizations popularity shows an uneven distribution of the indegree scores in the analysed groups. The "Climate Change" group assembles twelve out of 20 actors with highest indegree scores. In addition, four out five actors in the top of indegree scores are from "Climate Change" group (Table 2). This is due the nature of this group, which is basically a group formed by most of ministries included the Inter-Ministerial Committee on Climate Change (CIM) and by state agencies involved in mitigation and adaptation policy formulation.

The "Non-government Mitigation" group has six out 20 organizations with highest popularity indexes. There are representatives from diverse categories, but the majority of organizations are non-governmental and non-profit organizations (NGOs), and most of actors are mitigation specialists but this group has the biggest number of organizations working on integrated approaches, trying to bridge mitigation and adaptation in their actions.

Table 1: Subgroups emerged from the faction analysis and their characterization according to administration level, climate change efforts and actor's category.

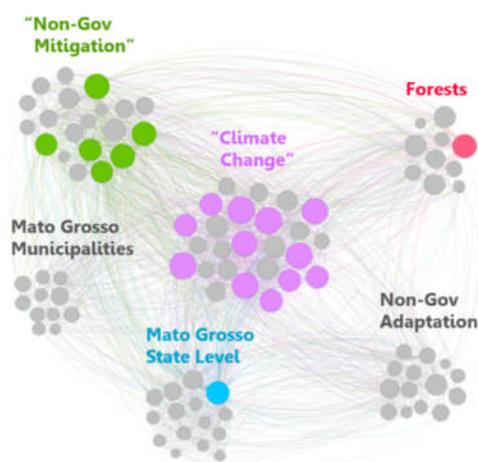| Subgroup Name	General Description	N	Distribution and Characterization of Organizations in the Subgroups	
Mato Grosso State Level	More than half of the group is private actors from, but still diversified state level group	15	Administrative level:	2 National, 12 State, 1 Municipality
			Climate Change efforts:	0 Adaptation, 6 Mitigation, 2 Integration, 4 Both, 3 Non-Climate
			Actors' Category:	1 Government, 3 Non-Government, 2 Research, 8 Business, 1 IGO/Donor
Municipality level group	Most actors from Municipality level	14	Administrative level:	1 National, 1 State, 12 Municipality
			Climate Change efforts:	2 Adaptation, 1 Mitigation, 4 Integration, 6 Both, 1 Non-Climate
			Actors' Category:	7 Government, 3 Non-Government, 3 Research, 1 Business, 0 IGO/Donor
Non-Governmental Adaptation Group	Most actors are environmental justice and Indigenous rights NGOs	11	Administrative level:	9 National, 2 State, 0 Municipality
			Climate Change efforts:	3 Adaptation, 3 Mitigation, 1 Integration, 4 Both, 0 Non-Climate
			Actors' Category:	1 Government, 10 Non-Government, 0 Research, 0 Business, 0 IGO/Donor
National Climate Change	Government National Level, Research Institutions and International Organizations with a head office in Brazil	25	Administrative level:	25 National, 0 State, 0 Municipality
			Climate Change efforts:	9 Adaptation, 6 Mitigation, 2 Integration, 5 Both, 3 Non-Climate
			Actors' Category:	16 Government, 2 Non-Government, 4 Research, 0 Business, 3 IGO/Donor
Non-Governmental Mitigation Group	Diversified but majority actors from NGOs, strong mitigation agenda	20	Administrative level:	20 National, 0 State, 0 Municipality
			Climate Change efforts:	1 Adaptation, 13 Mitigation, 5 Integration, 1 Both, 0 Non-Climate
			Actors' Category:	1 Government, 12 Non-Government, 3 Research, 4 Business, 0 IGO/Donor
Forest Actors	Actors working mainly with Forests issues	10	Administrative level:	9 National, 1 State, 0 Municipality
			Climate Change efforts:	3 Adaptation, 3 Mitigation, 1 Integration, 3 Both, 0 Non-Climate
			Actors' Category:	3 Government, 3 Non-Government, 1 Research, 1 Business, 2 IGO/Donor

Figure 2: Six subgroups on climate change information sharing. The size of the nodes indicates the popularity index, i.e., the number of direct citation an actor received from others in both mitigation and adaptation communication networks.

Table 2: popularity index for the actors with highest scores (the sum of indegrees for mitigation and adaptation communication networks).

SubGroup	Organization	Organization Category	Administrative Level	Popularity Index
Climate Change	EMBRAPA*	Research Institutions	National Level	89
Climate Change	FBMC	Domestic or International NGOs, CSOs and SM	National Level	72
Climate Change	MMA-Adaptation	State and Bureaucratic Actors	National Level	69
Climate Change	CGMC-MCTI	State and Bureaucratic Actors	National Level	63
Non-Government Mitigation	IPAM	Domestic or International NGOs, CSOs and SM	National Level	61
Climate Change	MAPA	State and Bureaucratic Actors	National Level	61
Non-Government Mitigation	WWF	Domestic or International NGOs, CSOs and SM	National Level	59
Forests	ICMBio	State and Bureaucratic Actors	National Level	57
Climate Change	ANA	State and Bureaucratic Actors	National Level	57
Climate Change	SAE-PR	State and Bureaucratic Actors	National Level	55
Non-Government Mitigation	TNC	Domestic or International NGOs, CSOs and SM	National Level	54
Non-Government Mitigation	BNDES	State and Bureaucratic Actors	National Level	51
Mato Grosso Municipalities	IBAMA	State and Bureaucratic Actors	National Level	51
Non-Government Mitigation	OC	Domestic or International NGOs, CSOs and SM	National Level	51

Climate Change	PBMC	Research Institutions	National Level	50
Non-Government Mitigation	ISA	Domestic or International NGOs, CSOs and SM	National Level	50
Mato Grosso State	SEMA-MT	State and Bureaucratic Actors	State Level	50
Climate Change	Fundo Clima	State and Bureaucratic Actors	National Level	48
Climate Change	MMA-Mitigation	State and Bureaucratic Actors	National Level	46
Non-Government Mitigation	FGV-Ces	Research Institutions	National Level	45
Forests	GIZ	IGO or Donors	National Level	43

* The Appendix 1 shows the full name of the actors presented in Table 1 in the original Portuguese name and in its English version.

Discourse Analysis

The Table 3 bring the results of discourse analysis of two actors in each group, except for the "Climate Change" group for which we present the analysis of five actors. The discourse summary are presented for three main themes: climate change problems, mitigation priorities, and adaptation understanding and priorities. From the first topic - climate change problems - the data showed three problems classes: i) causes, ii) impacts and governance, and iii) governance, policy and decision-making problems. The second topic is about understanding of adaptation and we present the results from those actors who clearly defined their definition about it. The third topic refers to the mitigation and adaptation priorities and we found the following content: i) general mitigation guidelines; ii) specific instruments to be pursued; iii) political or governance aspect.

In the "Climate Change" subgroup we observed that problems definitions and priorities are connected with the actors mandate and activities. Most of actors identified governance and policy aspects as major problems to fight climate change in the country. General speaking, three organizations pointed fighting deforestation as a main priority for mitigation and three pointed low carbon agriculture as a priority. The level of detail in the propositions depends on the organization and division mandates. We observed the same pattern on the adaptation topic. ANA (Brazilian Water Resources) understand that for adaptation be successful it should be connected to territorial strategies of land use, to avoid concurrency and disarticulation of actions. The MMA-DA (the adaptation department of the Ministry of Environment) understand adaptation as a non-regret policy approach and it should be integrated with development agenda to foster polices such food security, sanitation, indigenous and forests programs. For the MCTI (Ministry of Science, Technology and Innovation, Global Climate Change division), the priority number one is around water resources because of the sectors dependency from the resource, such energy and agriculture. For MAPA (Ministry of Agriculture and Livestock), the priority lies on implementation of low carbon agriculture and the adaptation refers to farmers behaviour in learning new productive process and integrating themselves in a new productive reality.

Table 3: Discourse analysis – main climate change problems and mitigation and adaptation priorities.

Subgroup	Actor	climate change problems	Mitigation priorities	Adaptation understanding and priorities
Climate Change	MAPA	Governance/Policy - policy implementation	carbon off-setting for agriculture - exists only on CDM schemes, but the agriculture processes	research with behavioural focus: how farmers can learning a new process and integrate themselves in a new reality farmers capacity building, information transfer adaptation very related to the food security adaptation co-benefits - drive local economy
	MMA-DA	Impacts - climate change impacts in peoples' lives, mainly impact of disasters, extreme weather events, food security	fighting deforestation mitigation sectoral plans	non-regret policy approach - take advantage to foster policies such sanitation, food security, indigenous and forests policies atlas of ecosystem services in Brazil: importance and climate change impacts integrate climate agenda and development agenda
	CGMC-MCTI	Governance/Policy - lack of resources for research, institutional arrangements and mandates, political convergence on different ministries and bodies of action	fighting deforestation - zero illegal deforestation, monitoring projects TerraClass, Biomes Monitoring Program low carbon agriculture: productivity investments in opened areas (TerraClass, CAR), ABC Plan (investments on carbon monitoring, and how to stock carbon in agriculture: soil, biomass, etc)	investment in knowledge generation - decision making and priorities mitigation efforts are not preventing future impacts - need for adaptation in serious way water resources - priority one: dependent sectors: energy and food. Still denial of linkages between water problems and cc agriculture and food security
	FBMC	Governance/Policy - lack of external coherence	techniques and technology for low carbon agriculture	historical vulnerable population vulnerable population - extreme weather clarify current and future vulnerabilities - uncertainties in those are a challenge

		Industrial Production and Consumption Systems		first know than prioritize
				human coexistence approach
	ANA	causes: Land Use and Land Use Cover Change	Protected Areas, command and control, PES: state+marked instruments	Economics of Climate Adaptation (ECA),
		impacts: events that extrapolate the historical data series, such severe droughts and floods		avoid concentration of industries in the same region (diversify)
		governance/policy: weak institutions to cope with variability, states with low operating capacity	mitigation is as well vulnerability reduction measure	adaptation success: correlated with territorial strategies of land use (avoid concurrency and disarticulation of actions)
				independent of the climate scenarios - tackling the vulnerabilities in all agendas is the key
Non-Government Mitigation	WWF	Causes - land use cover change, global demand for food driving deforestation	fighting deforestation - actions in the demand and supply set, changes in the current development model, interconnection with mitigation actions in other sectors: energy, transport, etc.	misapplication of adaptation - it is not risk management
				alternatives to improve the society well-being -apesar das mudanças climáticas que vão vir
				opportunity to improve well-being
				adaptation might be very expensive if it is not been planned now
				quality on well-being is dependent on: water, food and energy
				water: water security, maintenance of the water supply unity (basin), urban planning, rain water reuse
				food: diversification of food production processes
				energy: get out of the couple options: hydropower and thermos-power. Invest in wind, solar, biomass, and decentralized energy production and distribution
				Adaptation highly connected to AbE

	IPAM	Governance/Policy - lack of coherence of public policies, macroeconomic and fiscal policies with climate change policies	Economic instruments for preserve Forests	the best adaptation is mitigation. But in some sectors you might not have the ability anymore to cope with the impacts
				participatory approach to build an adaptation measure with small-scale livelihoods
				knowing impacts - knowing variedades que são resistentes à seca, à altas temperaturas, - food security
				prevention of forest fires - lose territorial integrity, resources, food
				focus on the edge effects in forests integrity - how to enhance the resistance of forests edges to avoid degradation and fires.
		impacts - precipitation severe abnormalities in forests areas - bringing fire on forests, lost of resources with implications for food security and territorial integrity	convergence of productivity and mitigation - progress of productivity is in the already opened areas, not in forest covered areas	challenge: bad adaptation
				enhancing productivity in opened areas: adaptation measures including forest recover in APP, RL, SAFs
				prioritize actions that can combine forests recover, productivity and income, water security and food security (SAFs)
Non-Government Adaptation	FMCJS	Impacts - climate change impacts in peoples' lives, mainly the most vulnerable; disasters and extreme events	zero deforestation	adaptation trap - adapt to not mitigate
			recreate forests and forests systems - Amazonia, Cerrado and Mata Atlântica	misapplication of adaptation concept - adaptation applied to measures to compensate emissions
			change in the agriculture model - restore the equilibrium between soil and atmosphere.	human coexistence with the semi-arid
			mitigation - against any marked oriented solution based on carbon credits and offsetting	human coexistence with Amazonia: indigenous people and solidarity economy

	Cimi-MT	causes - capitalism system and irrational natural resources use impacts - food security and health	no offsetting	
Forests	GIZ	causes: Deforestation, Agriculture and Livestock production	strengthen the linkages between scientific institutions (INPE, INMET, etc) to generate information and knowledge to support decision-making	thinking on the current vulnerabilities. To start taking decisions to become more resilient
		impacts: climate change per se is not an impact. CC is going to exacerbate a problem that exists already	strengthen institutions in the country	cost and benefits of adaptation options in long term
		Governance Policy and Decision-making: who is the public manager that is going to take a decision on an activity with the time horizon and uncertainties for 2070, 2010?	create incentives to private sector reduce emissions	cycle of diagnosis and actions
				priority actions related with investments in short and long term
				PVT sector has been considering cc in their risk planning and management?
	ICMBio	Impact of precipitation patterns changes and extreme events on protected areas and on the biodiversity	insert mitigation into the licensing processing	focus on extreme temperature pics, not on the average.
			mitigation as a disaster management measure	knowledge about climate change impacts on biodiversity
Mato Grosso State	SEMA-MT	Causes - agriculture, livestock, deforestation	low carbon agriculture: combine emissions reduction with enhancing productivity through techniques and technology	identification of impacts in the state level
		Impacts - rain distribution and intensity, erosion and siltation, planting and harvesting problems due rain patterns*	Inventory of land use emissions in the state level - facilitate the dialogue with other actors and associate it to the environmental license for the activity	identification of vulnerabilities in the state level
				plan a adaptation strategy that suits the state reality

	FAMATO-MT	uncertainties of emissions estimates for livestock	First priority is the environmental regulation of the land	
		denial of impacts - today there is no impact of climate change in the agriculture or livestock sector in the MT state	Inventory of land use emissions (land use sector chains) in the state level - to show the real numbers	Adaptation only as a mitigation measure, not as reducing vulnerability measure
			Inventory of land use emissions in the state level - forest areas quantification to identify the environmental assets (carbon)	
Mato Grosso Municipalities	SECMA-AF	impacts: precipitation patterns and weather variability	continuation of the spring restoration and areas reuse of degraded areas investment in ILPF	
	Embrapa-SI	lack of meteorological data for MT for a long-term comparison	zero illegal deforestation	focus on the agro system production, not only in one plant or animal
		uncertainties if impacts are due cc or if it is a weather variability	low carbon agriculture: techniques and technology to reduce emissions and stock carbon agro systems integration as a mitigation measure MDL - waste management and planted forests	
		combination of weather variability with climate change impacts: severe drought in 2005 and 2010 in Amazonia	development of national emission factor, with a national methodology renewable energy	genetic crop improvements - but is not the main factor

In the "Mato Grosso State" subgroup we found that both actors think that the emissions inventory in the state level is a high priority measure, but they have distinct motivations and objectives. SEMA-MT (the environmental secretariat in the state level) think that the inventory would facilitate the dialogue with actors and it could be used to produce mitigation requirements on the environmental license for agribusiness activities. FAMATO-MT (the Mato Grosso agribusiness association) understand that the inventory could precise the national numbers produced by INPE (Brazilian Institute of Space Research), which doesn't reflect the "on the ground" reality. FAMATO says as well that the sectoral emissions inventory could quantify forest areas and the carbon assets, which would bring benefits to the land owner through carbon markets. The organization stated that they stand up against the idea of coupling up the inventory to mitigation requirements in the agribusiness licensing procedure.

FAMATO presented a view about climate change problems that differs not only from SEMA-MT, an organization that pertain to its same network subgroup, but as well from all other actors. FAMATO doesn't recognizes climate change impacts in the agriculture and livestock sector. The organization as well understand adaptation in a different way. As they do not recognize impacts of climate change on the sector, the word "impact" was understood as the consequences that the sector might produce on climate and national emissions. Regarding this, they state the uncertainties about the sector emissions, mainly the livestock sector. In this sense, "adaptation" for them is essentially a mitigation measure associated with the productive process.

In the "Non-Government Mitigation" subgroup, IPAM (Amazon Environmental Research Institute) highlighted that one of the main problem regarding climate change is the lack of coherence of public policies, macroeconomic and fiscal policies with policies on climate change. WWF-Brazil (World Wide Fund for Nature), the other organization analysed in this group showed a similar vision with a different angle: there are linkages between mitigation actions in other sectors that needs to be taken into account. IPAM see that the best adaptation action is still mitigation, while it doesn't neglect that in some agendas adaptation measures are needed. WWF see adaptation as alternatives to improve well-being for the society and stressed what they called a misunderstanding of adaptation as risk management.

In the "Non-Government Adaptation" subgroup, both actors – The FMCJS (Brazilian Forum on Climate Change and Social Justice), and CIMI-MT (Missionary Council for Indigenous Peoples in Mato Grosso State) – cited the impacts of climate change on vulnerable populations as a major problem in Brazil. Those actors also agreed on declining any mitigation solution based on offsetting and carbon credits. The only actor outside this group who share the same view was FBMC, who is part of the "Climate Change" subgroup.

Discussion and Conclusions

This work presented the results of an ongoing project that intends to understand coalitions based on network interactions and discourses in the climate change policy domain in Brazil, with focus on Land Use and Land Use Cover Change. The policy process around those themes is lively in the country: national strategy on REED+

had been launched in December 2015, the review of the ABC plan is scheduled to happen in a period not longer than 2 year from its creation, the National Plan on Adaptation have been in public consultation and must be published soon. In addition to this, the National Plan on Climate Change has as well periodic scheduled review, and the country just submitted the Third National Communication to UNFCCC. Those new instruments will trigger new dynamics in the policy arena and the multitude of organizations involved in the debate and actions around mitigation and adaptation will seek their interests in the policy implementation and in new instruments formulation.

As a dynamic process, we do not tried to identify and determine fixed coalitions. This network analysis is a cross-section study, one point in time on the whole political process involved in fighting climate change. This is a limitation of this study. Apart from this, we were able to identify subgroups, or pre-coalitions, based on network interaction patterns. Those patterns suggest actors tend to primarily interact with actors from the same jurisdictional level. The other factor involved in the possible subgroup formation is the level of actors' specialization in mitigation and adaptation. One point to highlight is the partition a forest driven actions actors. Forests are considered socio-ecological ecosystems where the benefits of integration between mitigation and adaptation might be optimized (Locatelli et al 2011, Duguma et al 2014, Locatelli et al 2015). We didn't find convergence in the discourses between the actors inside the "Forest" group, and further analysis are needed to identify the alignment or differences between the discourses in this group with those from the "Non-Government Mitigation" and "Non-Government Adaptation" groups.

The Mato Grosso state group presented divergences the definition of climate change impacts and causes and on the instruments options to fight greenhouses gases emissions. Our next step in this analysis will be a complete network discourse analysis to identify alignments of those different discourses with other actors in the subgroup. This could help us to understand the constraints of policy process in Mato Grosso.

Most actors in the "Climate Change" subgroup agree climate change problems in Brazil – their nature is from policy and governance. Despite that, we couldn't find convergence on the discourses about which problems are the most critical in the country. The actors tend to cite as most important problems or priorities those that are key under their division agenda. The discourse analysis for all actors in the subgroup might reveal new insights about the discourse alignment of actors in this most powerful subgroup in this case study. Further analysis will involve as well subgroup analysis on collaboration networks to help us to understand climate change coalition's formation in Brazil.

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