

**ENVIRONMENTAL RISK MANAGEMENT AND  
COMMUNICATION IN AN AFRICAN CONTEXT: THE CASE OF  
THE MOZAL BYPASS IN MOZAMBIQUE**

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## **Environmental risk management and communication in an African context: The case of the Mozal bypass in Mozambique**

*This article aims to analyze the way in which Environmental Risk is managed and communicated to local people in an African context. In particular, the article considers the experience of one of the largest multinationals that operates in Mozambique: Mozal (Mozambique Aluminum). In 2010, it decided to make a "bypass" at its two Fume Treatment Centres. For six months, Mozal had been authorized to discharge emissions into the air without any filters, possibly damaging human health. The article seeks to understand how the various parties involved, institutional or otherwise, acted in order to prevent, manage and communicate this risk. The study is developed at two levels: firstly, the debate on risk communication in the Mozambican context; secondly, the same debate but at international level. As a conclusion, it is possible to argue that the weak and formal model of democracy present in Mozambique did not make it possible to obtain guarantees that have been considered serious and significant at international level.*

**Keywords:** Mozambique, environmental risk, risk management, risk communication, participation, pollution

## **Gestão e comunicação do risco ambiental num contexto africano: O caso do bypass da Mozal em Moçambique**

*Este artigo pretende analisar o modo em que o Risco Ambiental é gerido e comunicado às populações locais num contexto africano. De forma mais específica, o artigo considera a experiência de uma das maiores multinacionais que operam em Moçambique: a Mozal (Mozambique Aluminum). Em 2010, a Mozal decidiu levar a cabo um "bypass" aos seus dois Centros de Tratamento de Fumos. A Mozal tinha conseguido uma autorização para lançar as suas emissões no ar sem filtros durante seis meses, com a séria possibilidade de prejudicar a saúde humana. O artigo procura perceber como os vários intervenientes envolvidos, quer institucionais, quer não, atuaram para prevenir, gerir e comunicar este risco. A pesquisa desenvolve-se de acordo com dois níveis de análise: primeiro, o debate sobre a comunicação do risco no contexto moçambicano; segundo, o mesmo debate mas ao nível internacional. Como conclusão, é possível deduzir que o modelo fraco e formal de democracia presente em Moçambique tem tornado impossível obter garantias que, pelo contrário, têm sido consideradas sérias e significativas no cenário internacional.*

**Palavras-chave:** Moçambique, risco ambiental, gestão do risco, comunicação do risco, participação, poluição

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## A short conceptual framework

“Risk” is a central issue in Social Sciences today. The issue of risk became particularly important during the sixties, thanks to two studies relating to nuclear and technological risk (Sowby, 1965; Starr, 1969). But this issue has been popularized, especially after the formulations of Luhmann, Beck, Giddens and Douglas (Luhmann, 1979; Beck, 1986; Giddens, 1990; Douglas, 1992), opening new areas of research for sociology and anthropology. They all present risk as one of the crucial factors in “second modernity” or “reflexive modernity” (Beck, Giddens & Lash, 1994), attributing great importance to cultural factors as well as “objective” ones. This paradigm points out that, on the one hand, the main risk in today’s society would be technological (industrial activity and a great difficulty involved in managing nuclear power plants); on the other, a theory is developed on the permanent gap between “real” risk – as formulated by scientists – and the “perceived” risk – as interpreted by lay people. These studies discovered that risk becomes dangerous because of its unpredictability, inducing many scholars to look for an “alternative” paradigm in relation to the “scientific” one (Lupton, 1999; Sousa Santos, 2004), and that it is necessary to distinguish between different perspectives when someone intends to study risk.

New conceptualizations of risk have been formulated over the three last decades: in 1988 the *Social Amplification of Risk Framework* (SARF), first elaborated (Kasperson, Renn, Slovic *et al.*, 1988) the theory of risk perception (Peters, Covello & Mac Callum, 1997; Sjöberg, 1998, 2000), including the perspective of mass media coverage of risk issues (Sjöberg, Kolarova, Rucai, Bernström & Flygelholm, 1996; Kitzinger, 1999). Finally, a more “normative” approach was made, which tends to make suggestions to public institutions and industrial managers on how to approach risk situations and risk “crisis” situations, informing and involving local people (Covello, Sandman & Slovic, 1998; Sandman, 2001).

Important steps have been made in order to include local communities in the risk management process. In 1990 five institutional mechanisms for allowing lay people to influence environmental risk decisions were defined, namely: public hearings, initiatives, public surveys, negotiated rule making, citizens review panels (Fiorino, 1990). Starting from Fiorino’s model, five years later, other scholars gave a clearer idea about the use of technology in the United States.

Due to the uncertainty surrounding the use of the technology implemented in industrial factories, attention to these questions has been growing in many Western countries, in the political as in the public opinion area. In the Swedish Parliament, the share of risk-related bills has tripled over the last thirty years

(Sjöberg, 1998), while mass media have also increased their coverage of environmental risks, in parallel not with the “real” danger, but with the number of participants in anti-nuclear and anti-industrial demonstrations (Kitzinger, 1999).

In a sense, the media coverage has not generally been oriented towards explaining the reasons and possible consequences of the risk, but has rather tended to polarize the debate in a very simple way, with weak scientific basis. This is what has been noted in the case of New Jersey papers’ reports on this issue. In this case, 57% of the sources came from the government, only 32% of the paragraphs analyzed dealt with the risk at all, and the coverage revealed “unsupported opinion – someone asserting or denying the risk without documentation” (Sandman, 2001). These data are important for this study, since they reveal that in an advanced democratic system as the United States, the press considers issues related to environmental risk occasionally, giving the readers few information on the nature of the risk, on the existence or not of legal limits of emission and especially on the political initiatives in order to prevent, to cope and to manage this kind of risk. Follow-up of news is weak (*ibid.*).

But this increasing interest in the political sphere and in the mass media does not mean that lay people trust institutions. In fact, in parallel with legislation on environmental risk, trust in politics has diminished dramatically in the past years, as opinion studies clearly show (Lipset & Schneider, 1983; National Civic Review, 1992). More recently, trust in government has decreased nine points at international level (with 43% votes). In parallel, trust in non-governmental organizations (NGOs) remains at around 60%, and trust in mass media around 50%, with a small increase (Traynor, 2013). Unfortunately, no African country was considered in this international sample, so it is difficult to make any conclusions in that respect. For these reasons, it will be necessary to make some deductions indirectly, using research on environmental risk carried out in other contexts.

The scenario described here reveals some crucial elements:

- Risk – and particularly environmental risk – has become an important subject for sociological and anthropological research;
  - This is due to growing public concern in relation to the issue;
  - This attention has induced mass media to cover issues of risk, even if it is occurring in a not very scientific way;
- Growing knowledge and awareness in relation to environmental risk has been caused by several serious accidents, which have contributed to diminishing trust in the political capacity to manage and prevent these harmful situations;
  - In parallel, the degree of trust in NGOs and the mass media has overtaken the degree of trust in political parties and institutions;

- In order to reduce this gap, various institutions and some industrial groups have been trying to implement risk communication and management policies, involving local people and communities in this complex process. This dialogue should be based on knowledge and expertise, openness and honesty, concern and care (Peters *et al.*, 1997). So the task of risk communication should be “to alert people when they ought to be alerted and reassure them when they ought to be reassured”, configuring this particular kind of communication as a “rational alertness, not passive trust” (Sandman, 2001).

This picture can be applied to the Western situation. But what about African context?

The six factors illustrated above are not valid for the major of Sub-Saharan African countries. First of all, environmental risk – or, in general, risk at all – is not yet a central issue here. If we analyze the studies on risk in Africa, the main perspective is related to politics and economy, and to foreign investments, as clearly shown by the World Economic Forum. In its publication, a large amount of space is dedicated to “Geopolitical Instability”, “Economic Shocks”, and then to Food Security and Climate Change. No reference is made to environmental and industrial risk (World Economic Forum, 2008).

As Luhmann stressed (Luhmann, 1979), it is impossible to talk about risk if people do not have an idea or awareness of it. In Africa, it is very difficult to transmit correct information in this sense, since the parties that could (and should) do it are afraid to fulfil this task, and the level of basic scientific knowledge is very low. In many African countries, such as Mozambique, many subjects of civil society are in the hands of the ruling party (in this case FRELIMO<sup>1</sup>): syndicates, media (especially the public ones), some national NGOs and so on. For this reason, the main goal of these actors is to protect governmental actors instead of denouncing risk situations, such as the ones coming from factory pollution. So, the basic strategy is to diminish and not to emphasize the risk. In this context, great multinational enterprises maintain low levels of communication of their polluting activities, for the lack of subjects able to control them and, in general, for the weakness of a legislative frame too. Therefore, the only parties that can inform African people about possible risks are, in general, “rebel” NGOs’ representatives. Their pressure on political and economic power is accompanied only partially by the mass media, which in general do not have an editorial, autonomous line on the coverage of environmental risk. As shown in the examples of Bulgaria and Romania, whose type of democracy is comparable to that of many African countries, hazard reports are frequently censored by political power, leaving people

<sup>1</sup> Mozambican Liberation Front.

ignorant about the possible risks deriving from any industrial activity (Sjöberg *et al.*, 1996). Until today, in Sub-Saharan Africa information on environmental risk has been written off “by global media firms as too poor to develop” (Herman & McChesney, 1999, p. 199).

In addition, in Africa the process of development has been carried out, since the first independences, through a quantitative approach, according to the dominant paradigm of a permanent and uninterrupted growth. So, the ruling classes have always trusted Western science and technologies, under the expectation to receive funds from international donors. Such a conclusion can be deduced, for instance, from many declarations, among which one seems particularly significant. In 2005, the national science academies of the G8 nations, together with the Network of Africa Science Academies, declared: “We recognize that science, technology and innovation underpin success and sustainability in all aspects of international development in Africa, including poverty alleviation and economic growth as well as in areas such as health and agriculture” (G8, 2005).

Starting from these bases, it is not difficult to understand why in Africa issues related to risk have been ignored or omitted. Africa has been transformed in a sort of laboratory to experience new but highly risky techniques, thanks to the common interests of international donors, multinational enterprises and local ruling classes. Some examples of this alliance can be inferred from two strategic sectors: natural resources and agriculture. In the first case, Shell began to look for gas in Karoo region of South Africa, a semi-arid and very poor territory, through the technique of “hydraulic fracturing” (“fracking”). It had a terrible impact on this fragile environment, especially on water availability. As a reaction, South African Government cut the funds for new research in this sense to Professor Van Tonder (University of the Free State), who wanted to study better the environmental risks and impacts of fracking, meanwhile Susan Shabangu, Mineral Resources Minister, stated that this process will stop only if someone will show scientifically that it pollutes water (but cutting research funds no one will be able to do it).

Similarly, a report of the United Nations University showed that, in the agricultural field, “there is no evidence that the application of the GM technology has resulted in substantial human health effects or environmental problems”; so, “Africa must be saved from hunger” exactly by genetically modified organisms (Adenle, 2001). It is known that GMO applied to agriculture are monopolized by the six major multinationals in the world and that research in this field “has become increasingly profit-driven and less focused on needs” of common people (UNEP, 2011). For this reason some researchers are skeptical in considering risk as

an actual issue in Africa, since it cannot be isolated from the global politico-economic context (Bloemertz, Doevenspeck, Macamo & Müller-Mahn, 2012). And for this reason it seems probably that “international humanitarian assistance programs” have largely contributed to diminish “national conceptions of local risk management capacity” (Holloway, 2012, p. 18), involving in this dynamic African institutions of higher education too (*ibid.*, p. 28).

In Africa, trust in technology is functioning as a strong deterrent for avoiding considering environmental risk management as an important pivot to accompany development, at the light of the ideology of progress and poverty alleviation.

The case of Mozambique has to be framed in this general African context. Here, 48% of the people are still illiterate: consequently, this restricts the critical impact of the press to a limited urban social middle class. This is most true for public servants, in whose offices only the daily newspaper *Notícias* – controlled by the Mozambican Central Bank – is usually read.

But this is not the only issue that limits the possibility of developing public awareness about environmental risk in Mozambique. In fact, in this country there is not yet a law against environmental crimes, and the ruling class tends to present the use of technologies as completely unproblematic, even assuming an idolatring view of them. So the large foreign industrial investments are considered “right” and therefore cannot be questioned by the population. The discourse of the current President, Guebuza, on “development” and accelerated industrialization confirms this trend; the way in which multinational enterprises entered the natural resources sectors (first of all coal and gas) is another confirmation of this trust in industrialization and technology (Castel-Branco, 2010).

On the other hand, the political system is blocked. FRELIMO has been governing Mozambique since its independence (1975). This kind of “authoritarian democracy” (Rønning, 2009) has limited people’s participation in the decision-making process in several fields. Therefore, the intervention of civil society in the governance process has been modest, and the solidity of these organizations is very poor, generally bringing together just their founding members, i.e., no more than 15 people. Furthermore, a significant part of their leadership continues to be in the hands of FRELIMO, coming from public servants, thereby diminishing their potential for criticism (Afrimap & Open Society Initiative for Southern Africa, 2009).

The case analyzed here deals with the request by Mozal to work for six months (in truth, 137 days) without any filters, emitting its polluting gases directly into the air. Mozal is a multinational with Anglo-Australian capital and is controlled by BHP Billiton, and involves a direct investment by the Mozambican state, which

holds 4% of the company's shares. It is located in the south of Mozambique, in the town of Matola, and began its production in 2000.

This article aims to analyze how the different social actors, such as institutions, political parties, local media and NGOs, have dealt with the issue of the bypass operated by Mozal between 2010 and 2011 at domestic and international level.

## Contextualization

The Mozal project had been planned in 1995, just three years after the signing of the General Peace Agreement between the Mozambican Government and RENAMO<sup>2</sup>. In 1998, construction work for the facilities began, and in 2000 the plant started production. Today, Mozal is the fifth-largest company in the world in the field of aluminum production; it contributes around 100 million dollars to the Mozambican balance of payments (INE, 2005). The total amount of the initial investment was approximately USD 1340 million, and the production process consumes four times more energy than the rest of the country (Granjo, 2003).

During that initial period, in accordance with International Monetary Fund (IMF) and World Bank (WB) recommendations, African countries had to provide facilities in order to receive this kind of investment (World Bank, 1981): as a result, Mozal was exempted from paying taxes. This situation continues until today, causing a great amount of political controversy (IESE, 2010).

Mozal has always had a very ambiguous approach to the local community and the media. On the one hand, it created an association called the Mozal Association for the Community Development, investing, in the first year (2000), USD 1.7 million to promote development activities in the region within 20 km of its facilities. On the other hand, the level of information and participation of local people, communities and NGOs in its core activity has always been very poor. Mozal's management has always ignored the principles of modern communication in relation to environmental risk. At internal level too, the choices made favored a "worker elite" able to absorb the ideas and procedures imposed, based on BOP (Best Operation Proceedings). The basic objective was to disseminate a mentality of prevention, embedded in the conviction that the technology used in this modern company could and had to lead to a "zero harm" situation (Granjo, 2003). This conviction has always been based on academic expertise.

This trend created a marked dichotomy: on the one hand, there were those who saw Mozal's investment as absolutely important and strategic for the future of

<sup>2</sup> Mozambican National Resistance.



Mozambique; on the other, there were those who thought that the environmental problems brought up by this project were particularly serious compared with the real benefits for the local economy. The local press has reflected this debate: in the public papers (namely the daily *Notícias*), Mozal has always been presented as a company that greatly contributes to the development of Mozambique. The demonstration of its political and economic importance became clear when five heads of state attended the opening ceremony for the plant (*Notícias*, 22/06/2001).

However, polemical questions of an ecological nature have never stopped appearing. In 2001, the then leader of the Green party, Guimarães Lucas Mahota, accused Mozal of perpetuating a real “environmental catastrophe” and accused the government of lacking ecological ethics due to its silence on the matter (*Savana*, 11/5/2001).

Two interviews in Maputo with prominent journalists, Jeremias Langa, the former director of information of the Soico Group, and Salomão Moyana, the dean of Mozambican journalists and director of the weekly newspaper *Magazine Independente*, pointed out that the Mozal’s approach has always gone against the basic principles of proper environmental communication, whether dealing with situations of risk or not (McCallum, Hammond & Covello, 1991)<sup>3</sup>. This approach is especially contradictory, since Mozal obtained voluntary environmental quality certification (ISO 14001), which aims to ascertain whether or not a company maintains an adequate and coherent internal system to manage its procedures. Until today, the agreement between the government and Mozal is top secret, arousing suspicions and criticism over the years (Castel-Branco, 2010).

When the bypass crisis exploded, the *casus belli* was centered on a sort of plebiscite in favor of or against Mozal. The focus of the debate was therefore not the environmental risk. The Mozambican Government, which supported and gave the legal basis for all of Mozal’s decisions also entered the debate and was accused by a number of Mozambican NGOs and the independent press of not being able to deal with the issue, leaving the institutions at the mercy of Mozal.

Salomão Moyana, for instance, stressed that “the government was Mozal’s megaphone”, while Jeremias Langa defended that the basic right to access information is systematically denied to citizens, favoring unclear interests. The parliamentary forces were also – he stressed – “at the mercy of the company”: so “the Parliament does not oversee, does not take any initiatives, and reacts only when the media raise problems”<sup>4</sup>.

<sup>3</sup> Jeremias Langa was interviewed in Maputo, 18/03/2012. Salomão Moyana was interviewed in Maputo, 22/03/2012.

<sup>4</sup> Salomão Moyana and Jeremias Langa interviewed in Maputo, in August 2012.

These last statements clearly show how local actors have been excluded, at domestic level, from the Mozal's economic force. For this reason, some of them – namely six NGOs – decided to jump to international level in order to find the satisfaction that they did not get in Mozambique.

In the following points, the article will focus on the process of risk communication and the involvement of Mozambican civil society at the two levels mentioned above, i.e., domestic and international levels:

- How Mozal communicated and involved local stakeholders before and during the process of realizing the bypass;
- How the Mozambican Government dealt with this issue and how it communicated the risk arising from the bypass;
- How local NGOs reacted to the bypass project, especially in terms of external communication;
- In what way the flux of communication between these main subjects occurred, through some examples extracted from the debate in the Mozambican papers;
- Finally, how this debate has taken place at international level, in two ways: in terms of the procedures implemented by the NGOs that had complained about the bypass operation; and in terms of some of the international press, in which this debate has appeared.

## **The domestic debate on risk communication and the role of different social actors**

In this point, the focus will be on the approach of domestic actors in relation to the bypass, with particular emphasis on the way in which they communicated the possible risk arising from this operation.

### **The process of risk communication and the bureaucratic procedures relating to the bypass**

A short history of the bypass operated by Mozal can be summarized as follows: in 2009, a technical team found serious and unexpected steel corrosion in the two furnaces, which had to be substituted. Without giving any information to the public, Mozal began negotiations with the Mozambican Government, which decided to form an institutional working group in order to monitor this situation. At that time, Mozal's management had already decided to operate the bypass, rejecting all other technical possibilities to recover the two corroded furnaces. At the end of its work, this multi-sector group produced a study, entitled "*Modelação*

*da Dispersão e Deposição de Poluentes do Ar Emitidos em Regime de Bypass pela MOZAL*” (“Modelling of the Dispersion and Deposition of Air Pollutants Emitted During the Bypass Regime by Mozal”). This too was not disseminated. On 5 April 2010, Mozal, in one of its usual half-yearly meetings, introduced the issues related to the bypass. The agenda did not mention the bypass as one of its point for that meeting. This was the first moment at which the Mozambican public was informed about the need for a simultaneous bypass at the two Mozal furnaces. Access to the above mentioned study has been very difficult to obtain. Concerned about the new situation, JA! (Environmental Justice!) wrote a letter to the Ministry of Environmental Coordination (MICOA) on 8 April 2010 “requesting clarifications about the entire process of acquiring the special license” (Justiça Ambiental, 2010), whose response would arrive two months afterwards when permission for the bypass had been already granted. In June, a group of six national NGOs (the “coalition”), namely Justiça Ambiental, Livaningo, Centro Terra Viva, Kulima, Centro de Integridade Pública and Liga Moçambicana dos Direitos Humanos, decided to join together to oppose this decision, authorized by the Council of Ministers on 26 May 2010. This decision was also kept secret, and it was very difficult for the NGOs to have direct access to it, as will be explained later.

The study produced by the multi-sector group would be available to the coalition only after a petition with 15,000 signatures. But the NGOs representatives had to go to the Ministry of Environmental Issues Library in order to consult it, since it would not be delivered them. One of the central issues presented in the study was related to the level of air pollution. On page 30, it is possible to read that “não há como determinar em que medida a contribuição das emissões da MOZAL vai afectar as zonas atingidas” (“there is no way of determining to what extent Mozal’s emissions will affect the areas in question”). This conclusion encouraged the coalition to fight against bypass operation.

It acted, at first, at domestic level: further to the above mentioned petition, various letters were written to representatives of Mozambican institutions, such as the Head of State, the President of the Mozambican Parliament, the Chair of the Parliamentary Commission on Environmental Issues. A meeting with the President of the Parliament, Verónica Macamo, was achieved only in September after being postponed twice, and the coalition was then able to meet with the Parliamentary Commission of Environmental Issues. According to Vanessa Cabanela<sup>5</sup>, the first meeting was very formal, while the second was more inter-

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<sup>5</sup> Vanessa Cabanela is a manager of Justiça Ambiental (JA!), the NGO that had the most active role in the bypass affair. She gave an interview to the author of this article in August 2012 in Maputo.

esting, since the opposition parties (RENAMO and MDM<sup>6</sup>) especially showed great concern about the bypass operation. Thanks to them, the coalition gained the access to the special permission conceded by the Mozambican Government to Mozal in order to effectuate its bypass.

Vanessa Cabanela confirmed that several meetings with international donors and NGOs were held in Maputo. However, these subjects decided to stay out of the problem: so the coalition had to proceed in this difficult battle alone.

Since permission had been given, the coalition decided to apply to the Administrative Court, asking for: 1. permission to be suspended until such a time that the Court made its decision; 2. the withdrawal of permission, considering the risk for the health of Mozambican people living up to 100 km from Mozal's facilities.

The Court ignored these requests and so the bypass was not interrupted or cancelled. It took place between November 2010 and March 2011 and the effects on the health of the Mozambican people are not yet known.

The Court's decision was the end of domestic proceedings. The coalition then decided to look for an international party interested in considering its concerns.

Due to this decision, the area of the struggle changed dramatically; the bypass question took on an unforeseen and terrible echo at international level, revealing all the limits of secrecy and lack of transparency that had affected the domestic proceedings.

### **Risk communication: Mozal**

Mozal tried to limit its external communication on the bypass as much as possible. In fact, as seen in the previous point, it did the minimum stipulated by Mozambican law for similar cases. This is true not only in relation to the specific moment in which the bypass operation has been carried out, but also in relation to this research: in fact, it was impossible to communicate with Mozal management, despite the many attempts that have been made. Hence, it was possible, in this article, to stress just poor information of Mozal communication strategy, limited to what this company declared to media and to a few official meetings it promoted in order to respect Mozambican law. The process by which Mozal approached a serious environmental risk the bypass caused seeks to elucidate its "minimum strategy" of public communication.

When Mozal's management realized that a bypass for the furnaces was necessary (in 2009), the management spoke only with MICOA, avoiding giving any preventive information to the public or even to environmental NGOs. The first official

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<sup>6</sup> Movimento Democrático de Moçambique.

moment in which the situation was exposed occurred on 5 April 2010 at a public conference, but it used very technical and cryptic language and lasted only a short time. From that moment on, Mozal systematically reduced the flow of information on the bypass to a few scheduled communications in the press, avoiding participating in public debates, and even in a talk show organized by STV (Soico Television). Only thanks to the intervention of international subjects – such as the Compliance Advisory Ombudsman (CAO) and the European Investment Bank (EIB) – did Mozal accept to sit down with the applying coalition, although always in a situation of “controlled” communication. Throughout all the phases of the bypass process, Mozal’s management tried to use a strategy involving reticence, lack of public information and lack of transparency, and viewed the environmentalist coalition as its worst enemy rather than a potential valuable partner that could help it to better manage the risk situation.

### **Risk communication: the Mozambican Government**

The opaque approach adopted by Mozal was possible thanks to the Mozambican Government’s attitude, whose strategy can be summarized as follows:

- Since MICOA did not have the technical means to directly verify the nature and the extent of the furnaces’ problems, it completely trusted Mozal’s account, limiting all kind of information to the public. The first answer to JA! was given by the Permanent Secretary of MICOA, Maurício Xirinda, on 14 June 2010 (República de Moçambique, 2010): more than two months after JA! had sent the letter to collect information about the bypass. The answer was very ambiguous. First of all, Xirinda confirmed that MICOA had requested that Mozal carry out a study on the dispersion and deposition of fumes and gases emitted by Mozal’s furnaces during bypass in order to produce an Environmental Management Plan (PGA);
- MICOA pointed out that no special license had been given to Mozal until that time, but clarified that the only technically acceptable solution was to use a bypass;
- Although Xirinda declared in the letter that the special license had not been yet granted, MICOA’s letter gave a clear idea of the environmental impact of the bypass, concluding that “acute exposure of people and the environment to the substances that will be emitted during the bypass operations do not seem to pose a significant risk” (*ibid.*, p. 2). At the same time, chronic exposure will not be significant;
- Finally, the letter stressed that the study and simulations will be published after the inter-institutional team had concluded its work.

Due to the permanent pressure of the coalition, the Mozambican Government was forced to submit the bypass to public debate. Its approach was based on two parallel strategies: on one side, especially through the Environmental Minister, Alcinda de Abreu, it tried to reassure people that the bypass posed no risk<sup>7</sup>. On the other, the environmentalist NGOs were considered as enemies, accused of following a “hidden agenda” and of being financed by foreign partners<sup>8</sup>.

According to the Mozambican Government, the debate on the bypass introduced an ideological approach regarding technology, development and risk. At all public occasions – from the Parliament discussion to the talk shows on TV and in the press – Mozambican representatives underlined their complete trust in Mozal’s bypass, justifying this attitude with the international credibility of this multinational company. They accused common people and, in particular, the coalition of fuelling the lack of confidence in the country, pursuing objectives against the national interests (Bussotti, 2013). During the debate at the Mozambican Parliament, the then Prime Minister, Aires Ali, stated that the risk from bypass operation was zero, but that all great companies, in the future, should show a more open approach in terms of environmental communication than Mozal did in this case. In the end, the Mozambican institutions turned this debate into a dispute between those who were against progress and development in the country, such as NGOs and RENAMO’s party, and those who intended to promote progress and well-being, completely trusting the technology of the great multinationals. A concern with environmental risk was linked to a primitive vision of development, as if it was just a disturbance in the general growth strategy.

### **Risk communication and beyond: the role of JA! and other NGOs**

As seen above, the strategy implemented by Mozal and the Mozambican institutions aimed to attenuate the perception of the risk posed by the bypass. As a reaction, JA! defined a different field of debate; it transformed this uncritical and almost secret issue in a public one, emphasizing the possible risk arising from it.

The coalition tried to collect information from Mozal and MICOA, spreading it among the Mozambican people. In this point, the focus will be mainly on the latter issue.

JA! decided to make the bypass issue public in a very effective way. On 22 June 2010, it sent a letter to the daily newspaper *Notícias* with the title: “SOS Saúde pública e Ambiente”. The letter contested the secrecy under which the procedure had been conducted until that moment, denouncing the ambiguity and lack of

<sup>7</sup> See, for example, “Ministra do Ambiente assegura que Mozal vai operar sem filtros”, *A Verdade*, 27/10/2010.

<sup>8</sup> See “Ministra reitera que *bypass* não constitui perigo”, *A Verdade*, 03/11/2010.

competence of the Mozambican Government, posing some basic questions in relation to the risk of the bypass for human health and environment, to the involvement of local communities and to the contradiction of Mozal. Finally, JA! asks rhetorically why this multinational company is going to spend 10 million dollars, when – according to Mozal’s studies – even without filters the level of emissions may be respected?

As a second step, JA! involved other important NGOs (such as Livaningo, Liga Moçambicana dos Direitos Humanos, Centro Terra Viva, Kulima and Centro de Integridade Pública) in order to constitute a coalition to negotiate with Mozal and MICOA. From this moment on, the coalition began to carry out an intense action of informing the public.

The intense activity of the coalition, however, did not lead to concrete results, as shown above. The coalition then decided to involve important international entities, with the objective of activating mediation between the two parties. A letter was sent to 24 organizations linked with BHP Billiton, the largest Mozal shareholder. The two subjects that accepted the coalition’s invitation were the European Investment Bank (EIB), one of the main lenders to Mozal, and the Compliance Advisory Ombudsman (CAO) of the International Finance Corporation (IFC) of the World Bank Group.

The consequences and results of this decision will be shown below.

## **Risk communication in the national press**

This point will present the way in which Mozambican press approached the bypass case, considering three papers: the daily public paper *Notícias*, the daily private paper *O País*, and the weekly private paper *A Verdade*. As we will try to show, each one presents a different approach in relation to the bypass but it is possible to say that Mozambican press did not help its readers to understand the issue analyzed here.

The daily *Notícias*, controlled by the Mozambican Central Bank, generally represents the point of view of local institutions. The bypass case was not an exception. Its coverage concentrated on the four months between November 2010 and February 2011. Its attitude favored the attenuation of the risk caused by this operation, with the basic goal of safeguarding the public image of the institutions (Bussotti, 2013). This goal was sought by building a battle field with two opposing sides: on one side, the institutions and Mozal, which defended rational trust in science, technology and industrial development; on the other, NGOs, RENAMO’s party and lay people being interviewed, all of which expressed the opposite point

of view. *Notícias* gave a great deal of room to the former group, rather than the latter. Approximately, the ratio between these two different positions in *Notícias* was, in a quantitative term, 3:1, giving a clear idea of what had to be the most credible position.

*Notícias* portrayed the bypass as a controlled operation, never making it clear that it has arisen from an unpredictable and unpredicted technological accident. The only cases in which it used more violent tones is when it covered the political debate: here, especially through the words of the Minister of Environmental Issues, Abreu, it presented the “opponents”, especially NGOs and RENAMO’s party, as not only irrational, but pursuing a “hidden agenda”, against the interests of Mozambique, whose real aim was stopping the country’s development.

*O País* presented the environmental risks deriving from the Mozal bypass in a different way. Although showing poor technical knowledge on this specific issue, this private newspaper associated Mozal’s position with the Mozambican Government’s stance, trying to mock the weakness of the latter. Conversely, the opponents were represented as the only ones really concerned with sensitive issues related to the health of Mozambican people and protecting the environment. The titles are bombastic, as are the editorials that directly express the editor’s point of view. As examples, we could mention the following: “The unanswered questions on the Mozambican bypass”, written by the former director, Jeremias Langa (13/08/2010); “Mozal bypass: License to kill”, written by Lázaro Mabunda (24/09/2010), with a strong impact at national and international level. The editorial line of this newspaper was to amplify the environmental risks, as it is possible to read in the article published on 14 July 2010: “These toxic substances (...) are demonstrably harmful to public health”. Using the opposite approach to that used by *Notícias*, *O País* presented the Mozambican Government as being totally at the mercy of Mozal’s decisions, giving room to the NGOs’ claims and using them for political and controversial objectives. In conclusion, this type of coverage does not seem to give a clear idea of the real risks deriving from the Mozal bypass, amplifying the potentially dangerous aspects and showing the Mozambican Government’s ineptitude in dealing with sensitive situations like this one.

The weekly *A Verdade* published 19 articles on the bypass case in the period between 24 July 2010 and 9 November 2011, although the majority appeared between October 2010 and April 2011. The most interesting aspect is the fact that this paper rarely published reports made on its own, since it normally publishes “shared” articles that come from different sources. The main source was the AIM (Mozambican Agency of Information), used 10 times, followed by the coalition



(2 times). In this last case, *A Verdade* limits its journalistic activity to report press releases the coalition had sent to its redaction. In the first case (08/11/2010), few comments are made; in the second one (16/06/2011) no comments are made, just reporting the reply of the coalition to an article *Notícias* had edited in its edition of June, the 16<sup>th</sup>, 2011.

The point of view of AIM, as reported in *A Verdade*, clearly reflected the opinion of the Mozambican institutions and Mozal, so the goal of all these articles was to transmit an idea of zero harm, persuading people that the bypass would not be dangerous. The tone of the articles written by AIM and reproduced by *A Verdade* is quite aggressively against the coalition, justifying this process as a contribution to improving environmental conditions and discrediting all differing opinions.

Although the coverage made by *A Verdade* is in favor of the bypass, the AIM is able to give quite a clear idea of the various clashing opinions. This approach is not the same when the AIM – through Paul Fauvet – intervenes at international level.

## **Intervention of international subjects and its consequences**

As mentioned previously, the two subjects that answered the coalition's request for mediation positively were the European Investment Bank (EIB) and the two organizations of the Compliance Advisory Ombudsman (CAO), first the CAO Ombudsman and, because of the difficulties between the two parties, the CAO Compliance.

In the case of CAO, the questions raised by the coalition dealt with the process of communication and information, aiming at foreseeing most correct ways to manage situations like the one of the bypass. Initially, the two parties agreed on limiting negotiations to three key points and to six months. The three points had to be the following: a common base of information; validation of the processes for environmental monitoring, including access to the reports produced by independent consultants recruited by Mozal but not yet public; creation of a common agreement between the two parties to share data and information (CAO, 2011).

In spite of the effort to resolve the conflict, no agreement was made. The reasons were that Mozal did not accept to share its reports on environmental audits with the coalition and the rest of civil society. The reports deal with ISO 14001 Certification, issued by Bureau Veritas, its Annual Report, its reports on environmental performance and also the report analyzing the causes that led to the bypass. Once more, the main obstacle to reaching an agreement was the very poor flow of information and the communication of risk adopted by Mozal and the

Mozambican institutions. The international mediator considered these issues to be very serious – in contrast to what had been happening at domestic level – and it continued to attempt to find an agreement.

Then the coalition asked for the intervention of the CAO Compliance, which reached the following conclusions:

- In terms of pollution, the bypass did not constitute a harmful risk for acute and chronic diseases; the methods used by Mozal met the international parameters foreseen for such cases;
- Mozal “presented different and contradictory reasons for the need for rehabilitation” (CAO Compliance, 2012, p. 6);
- BHP Billiton applied “different criteria and procedures to a similar bypass operation in South Africa” (*ibid.*);
- MICOA “should not have issued the special permission for the bypass operation as the legislation only permits extraordinary emissions due to unforeseeable circumstances and the circumstances should have been foreseen by Mozal” (*ibid.*);
- “Information relating to the permission was not made available on request to the complainants by either MICOA or Mozal” (*ibid.*);
- “The public remains ill-informed about the exact risks of the bypass operation due to a lack of access to impartial information and transparency” (*ibid.*).

The intervention of the EIB focused on the air quality monitoring system and the sample taken by Mozal. In the final report it is possible to read a series of recommendations, amongst which the environmental audit that the coalition had been indicating as a pivotal point too, besides increasing the monitoring systems for air quality (EIB, 2012).

The impact of the intervention of these international organisms in the bypass issue was very significant, since it showed that there had been a serious lack of information, that the Mozambican Government had played a poor role, and revealed Mozal’s arrogant approach in dealing with these sensitive issues.

These concerns led Paul Fauvet, a distinguished journalist from the AIM, to violently clash with the Mozambican private press that had covered the bypass case.

## Risk communication in the international press

The fact that the coalition chose to make the bypass operation an international case provoked a heated debate in the international press. Among the different pieces, comments, and opinions expressed here, one case seems to be particularly

interesting: the online paper *allafrica.com*, in which the violence of the institutional positions are expressed by Paul Fauvet, of the AIM. On the other side, Nastasia Tay – a journalist engaged in covering human rights and environmental issues in Africa – took an opposing position, trying to adopt an approach coherent with the basic principles of risk communication, alerting people to the possible harms deriving from the bypass operation.

Two comments by Nastasia Tay are considered here: the first one was published on 20 September 2010, the second one on 24 November 2010. In the first one, she underlines the role of Mozambican civil society, which decided to oppose the bypass, giving an idea of the possible environmental impact of this operation: “The presence of fluoride in the anode production process,” she writes (Tay, 20/09/2010), “means that compounds which pose short and long-term threats to health are part of fumes during reprocessing”. Reporting the point of view of the NGOs, Nastasia Tay points out that the three public meetings that Mozal had to attend were poor in terms of information and certainly did not have the characteristics of a public consultation, as Mozambican law provides for these cases. She observes, after reporting the words of Mozal’s management, that the study in which the impacts of the bypass on health and the environment are shown to be “non-significant” is not public, so no one can assess the its credibility. The only public report, produced by the Mozambican Government, stresses that it is impossible to determine if Mozal will be responsible for the pollution in Matola area, since MICOA has no record of environmental quality. In order to corroborate the uncertain circumstances in which the Mozambican Government gave the special permission to Mozal to operate its bypass, Nastasia Tay decides to support her position with the opinion of a South African specialist, Prof. Harold Hannegan, from the University of Johannesburg. He defends that the governmental report uses “an inappropriate scale for its dispersion study”, so the result “tells us nothing”. He concludes by saying that “There’s been a complete lack of transparency” throughout the entire process. The opinion of a very important lender in the Mozal project, Desmond Dodd, who belongs to the International Finance Corporation (IFC), of the WB, also expresses great concern about the possible emissions that occur during plant maintenance.

The other article Nastasia Tay wrote in the above mentioned online paper was published on 24 November 2010, under the following title: “Mozambique: Controversial bypass under way at smelter”. The article seeks to give a clear description of the bypass situation up to that moment. But, once more, concerns prevail, and she stresses that the plant was “emitting potentially dangerous fumes into the air without treating them first – despite a pending court case on

the matter". The report states the opinion of the NGOs that were fighting against bypass, as well as the company's position. However, the journalist insists on the idea that, since the Mozambican Government has no means of measuring the air quality in the Matola area, all conclusions will be very questionable.

Indirect answers to these articles were given by Paul Fauvet (AIM), who entered into an open and fraught conflict especially with Mozambican NGOs, journalists of the independent press and RENAMO's party. In this case, as it is easy to note, the essence of risk is transformed: it shifts from environmental risk to political risk.

The online paper *allafrica.com* presented various pieces defending the Mozal bypass. However, our analysis will mention only those explicitly signed by Paul Fauvet. The author openly joins the political battle, identifying three "dangerous" subjects: environmentalist NGOs, opposition parties (namely RENAMO), but essentially the Mozambican independent press, repeatedly accused of misinformation through journalistically incorrect and deontologically reprehensible techniques (as in the case of the photomontages presented by *O País*).

The articles signed by Paul Fauvet are the following:

27/09/2010, *Mozambique: No threat to environment from Mozal bypass*

30/09/2010, *Tell me lies about Mozal*

13/10/2010, *Mozambique: External environmental monitors working at Mozal*

27/10/2010, *Mozal pledges emissions will not exceed legal limits*

29/10/2010, *Mozambique: Assembly votes to debate Mozal*

03/11/2010, *Mozambique: Mozal bypass essential to avoid collapse*

The first important element to stress is related to the dates on which Fauvet decided to intervene. In a very short period of time – about one month – he wrote six articles on the bypass case. The second element is related to the titles: they are "informative" or, in some particular situations, politically oriented (namely the second and last titles), clearly expressing the author's point of view. Finally, Mozal is quoted in all titles, sometimes as a "subject", in other cases as an "object" (as in the article of 29 October 2010).

Paul Fauvet's theory is the following: Mozal, supported by a prestigious international company and by experts at the Eduardo Mondlane University, has been constantly monitoring the level of its emissions, which are always within the legal limits. Consequently, there is no danger involved in the bypass operation; the procedures adopted in order to obtain permission were legally correct, so no criticisms can be made. Since Mozal does not represent any harm, the real danger comes from the outrageous misinformation campaign by the Mozambican private press. For this reason, Fauvet took on the task of disproving and entering

into a head-on attack with his colleagues whose goal was supposedly to fool and confuse Mozambican readers. The new field of confrontation is not the environmental risk, nor the political one, but the struggle for correct information. Paul Fauvet, convinced that he was right, took on the role of censor and judge of the Mozambican press, defending national interests against the campaign of organized demystification by the independent media.

This “crusade” takes the form of specific journalistic techniques:

- Direct and open confrontation with the independent press. Among his pieces, in the article of 20 September 2010, he wrote: “A campaign of lies and disinformation in parts of the Mozambican media against the country’s largest factory, the aluminum smelter Mozal, reached the front page of the daily paper ‘O País’ on Thursday”. In this case, he criticized the use of photographs in *O País*. Fauvet pointed out the images “of huge towers belching dense white fumes into the atmosphere. These towers (...) do not exist in Matola, or indeed in Mozambique. In this shockingly deceitful piece of journalism, ‘O País’ has unscrupulously used a photo taken in some other country to illustrate an article on pollution in Matola”. Fauvet is right, but the role of “censor” he decided to take on is questionable, informing the readers of the direct contact he had with the director of *O País*, Jeremias Langa. “He admitted,” Fauvet states, “that the paper should not have mentioned Mozal in the headline, and should not have used photos that have nothing to do with Matola. ‘It was a mistake of ours,’ he said”. Through this example, Fauvet was able to conclude that (article of 30 September 2010) “there are those in the media who prefer to describe the Mozal bypass as a ‘licence to kill’”. His conclusion was that these sources, due to their lack of credibility, advanced a theory, according to which “an enormous conspiracy to commit mass murder” had been organized. This theory was “palpably absurd”, as were the positions that represented the Mozal bypass as a risk. So he used the lack of professionalism by part of the independent press to silence all arguments against the bypass, making a direct and incorrect link between the credibility of the source and environmental risk issues. In his piece of 13 October 2010, Fauvet attacked another important independent Mozambican weekly paper, *Canal de Moçambique*. The technique he used is the same adopted for *O País*: discrediting the source. In this case, Fauvet wrote: “The latest shot was a singular vulgar article published on Tuesday in the right-wing news sheet ‘Canal de Moçambique’, which compared the Mozal bypass to ‘defecating in the open air’”. Fauvet classified this newspaper as a right-wing one. This was enough to destroy each argument *Canal de Moçambique* proposed.

- A negative representation of the “opponents”, through the use of adject-

tives belonging to specific semantic political fields. The subdivision presented is clear: from one side, the “good ones” – considered to be responsible and respectable – and from the other the “bad ones” – pertaining to the right wing (RENAMO’s party). Their political dignity is presented as being very low, as demonstrated by the expression that always accompanies the word “RENAMO”. Fauvet chose to use a rather incomprehensible form (“former rebel movement”), alluding to the fact that this political party had carried out strong resistance against the Marxist-Leninist regime during the Cold War. Translated in political terms, it means that RENAMO will never have political dignity, regardless of the positions taken on different issues. The height of his criticism is reached when he talks about the coalition. Here, he uses two different approaches. Firstly, he underlines the lack of consideration, on the coalition’s side, of Mozal’s importance for the country’s economy: “These considerations,” Fauvet wrote (article of 10 October 2010), “are rarely if ever mentioned by the environmental groups and their allies in the media who have waged a bitter campaign against the Mozal bypass”. However, these sources became credible when the groups defended arguments favorable to Mozal. In his piece of 9 September 2010, Fauvet intended to explain the high levels of pollution recorded during the second week of the bypass operation. His source of inspiration was Vanessa Cabanelas (JA!), who honestly affirmed that it is impossible to establish a direct correlation between those levels of pollution and Mozal’s activities: “But these results cannot be tied to any specific industry”, then “The claim (...) that dangerous particles only come from industry is laughably inaccurate”.

- The magnification of Mozal’s role and technical competence as well as that of the independent Swiss company in monitoring the levels of polluting emissions during the bypass. In this case, Fauvet tended to emphasize the international credibility of the two organizations. SGS, the Swiss company recruited by Mozal to monitor its emissions, is described as “the largest company in the world that specializes in inspection, verification and certification” (piece of 3 November 2010). Once more, the technique adopted is the same but in this case Fauvet aimed to give credibility to his sources, the opposite of what had occurred for the “opponents”.

- The great responsibility and “openness” demonstrated by Mozal and by the Mozambican Government in terms of risk management. He defended that (article of 13 October 2010) Mozal had an open and transparent approach: “The bypass,” he writes, “did not legally require public consultation – but the Ministry advised Mozal to hold one anyway.” So Mozal (and the Mozambican Government) made more efforts in terms of lay people’s right to information than

required by Mozambican law. Besides this, Fauvet uses the economic argument many times. Since Mozal is the country's largest exporter, employing 110 workers (97% of which are Mozambican), it is not convenient to create major problems for it; one day it will decide to leave the country, bringing bad consequences for Mozambican economy and society.

It is clear that Fauvet – who indirectly represents the interests of the Mozambican Government and Mozal too – uses different approaches to defend the bypass operation at domestic and international scales. The environmental risk is not communicated nor analyzed, but simply used as a political weapon in order to defend Mozambique's international prestige. In doing so, however, he achieves the opposite effect: his open radicalism and intolerance to the coalition reveals a situation of a country living in a partially democratic regime, in which non-institutional ideas can hardly achieve the dignity of public stances.

## Final remarks

This study aimed to analyze how a specific environmental risk was managed during a “crisis” (the bypass operation) in an African country like Mozambique.

As shown during the article, environmental risk in Africa is not yet a central issue, due to the convergence of various factors. Economic interest of multinationals and local ruling classes, strategies of international donors, weakness of an active public opinion and, in some cases, the control of media by the state: all these reasons contribute to determine a low concern for risk in Africa.

Mozambique has to be framed in this general context, with some interesting peculiarities.

First of all, the research has clarified that the Mozambican institutions were not prepared to face a crisis such as this one. MICOA was revealed not to have the technical instruments necessary to measure the levels of atmospheric emissions, so it had to trust the data delivered by Mozal. It means that Mozal has carried out the role of polluting subject and controller at the same time, imposing on the Mozambican Government all the conditions necessary to solve its technical problems.

Secondly, in terms of risk communication, the strategy chosen by Mozal and the Mozambican Government has been silence and lack of transparency. This was possible because of poor knowledge and concern among lay people in relation to environmental pollution, so that Mozal and the Mozambican institutions thought they could manage to not give any information to local communities.

This approach has been seriously criticized by the international organisms called upon by the coalition to mediate the conflict considered here.

Thirdly, the Mozambican press too showed a severe lack of professionalism and knowledge in covering the bypass case. If most of the independent press tried to amplify the risk, using inappropriate instruments, the public press on the other side generally reduced the issue to a political challenge to the Mozambican institutions. In both cases, the question of risk remained tangential and was not a core problem.

Fourthly, the domestic debate gave the idea that nobody could doubt the technical skills of Mozal's management. This view was unsuccessfully contested by the coalition and some independent newspapers at domestic level. But the CAO, when called upon to mediate, emphasized the quite incredible technical mistake made by Mozal's management, which had not foreseen the deterioration of its gas treatment furnaces, forcing the Mozambican institutions to accept a pre-determined situation.

Finally, the role of the coalition of NGOs has been very active and important. The coalition showed more competence and knowledge than all the Mozambican parties and institutions, while international donors were almost completely absent in this important debate. The fact that the coalition has been forced to tread new paths to protect the environment is an important and innovative element. As a consequence, Mozal had to make some concessions to the coalition, especially in terms of risk information, for current and future situations. It was clear that the coalition did not have a "hidden agenda", since its actual objective was to draw attention to serious environmental problems that the country had never dealt with before.

## References

- Adenle, A. A. (2001). *Are transgenic crops safe? GM agriculture in Africa*. In <http://unu.edu/publications/articles/are-transgenic-crops-safe-gm-agriculture-in-africa.html> (accessed January 19, 2012).
- AfriMAP & Open Society Initiative for Southern Africa. (2009). *Moçambique, democracia e participação política*. Johannesburg: Open Society Initiative for Southern Africa.
- Beck, U. (1986). *Risikogesellschaft: Auf dem Weg in eine andere Moderne*. Frankfurt am Main: Suhrkamp.
- Beck, U., Giddens, A., & Lash, S. (Eds.) (1994). *Reflexive modernization: Politics, tradition and aesthetics in the modern social order*. Stanford University Press.
- Bloemertz, L., Doevenspeck, M., Macamo, E., & Müller-Mahn, D. (2012). Introduction. In Bloemertz, L., Doevenspeck, M., Macamo, E., & Müller-Mahn, D. (Eds.), *Risk and Africa* (pp. 1-16). Zürich: LIT Verlag.



- Bussotti, L. (2013). Analysis of the press coverage environmental risk of Mozambique: The Mozal bypass case and newspaper "Notícias" and "O País". *Revista Luciérnaga*, 5(10), 28-40.
- CAO (Compliance Advisor Ombudsman). (2011). *Ombudsman assessment report: Complaint regarding the MIGA PT Weda Bay Nickel Project (#8113)*. Halmahera Island, North Maluku, Indonesia. In <http://www.cao-ombudsman.org>
- CAO Compliance. (2012, July 24). *Appraisal report*. CAO Ref. Code: C-1-R6-Y12-F160, 2012.
- Castel-Branco, C. N. (2010). Economia extractiva e desafios da industrialização em Moçambique. In Brito, L. de, Castel-Branco, C. N., Chichava, S., & Francisco, A. (Org.), *Economia extractiva e desafios da industrialização em Moçambique*. Maputo: Institute for Economic and Social Studies (IESE).
- Covello, V. T., Sandman, P., & Slovic, P. (1988). *Risk communication, risk statistics and risk comparisons: A manual for plant managers*. Washington, DC: Chemical Manufacturers Association.
- Douglas, M. (1992). *Risk and blame: Essays in cultural theory*. London & New York: Routledge.
- EIB (European Investment Bank). (2012, April). *Mozal Project, Maputo, Mozambique, Complaint SG/E/2010/16, Conclusions Report*. In <http://www.eib.org/about/publications/complaints-mechanism-policy.htm>
- Fauvet, P. (2010, September 27). *Mozambique: No threat to environment from Mozal bypass*. In <http://www.allafrica.com>
- Fauvet, P. (2010, September 30). *Tell me lies about Mozal*. In <http://www.allafrica.com>
- Fauvet, P. (2010, October 13). *Mozambique: External environmental monitors working at Mozal*. In <http://www.allafrica.com>
- Fauvet, P. (2010, October 27). *Mozal pledges emissions will not exceed legal limits*. In <http://www.allafrica.com>
- Fauvet, P. (2010, October 29). *Mozambique: Assembly votes to debate Mozal*. In <http://www.allafrica.com>
- Fauvet, P. (2010, November 3). *Mozambique: Mozal bypass essential to avoid collapse*. In <http://www.allafrica.com>
- Fiorino, D. (1990). Citizen participation and environmental risk: A survey of institutional mechanisms. *Science, Technology, & Human Values*, 15(2), 226-243.
- G8. (2005, July). *Joint science academies' statement: Science and technology for African development*. Gleneagles: G8. In <http://nationalacademies.org/onpi/06072005.pdf>
- Giddens, A. (1990). *The consequences of modernity*. Cambridge: Polity.
- Herman, E., & McChesney, R. (1999). The global media in the late 1990s. In Mackay, H., & O'Sullivan, T. (Eds.), *The media reader: Continuity and transformation* (pp. 178-210). London: Sage.
- Holloway, A. (2012). Disaster risk in Africa: Dynamic discourse or dysfunctional dialogue? In Bloemertz, L., Doevenspeck, M., Macamo, E., & Müller-Mahn, D. (Eds.), *Risk and Africa* (pp. 17- 34). Zürich: LIT Verlag.
- IESE (Institute for Economic and Social Studies). (2010). *Desafios da indústria extractiva em Moçambique*. Maputo: IESE.
- INE (Instituto Nacional de Estatística). (2005). *Anuário Estatístico*. Maputo: Artes Gráficas.

- Justiça Ambiental. (2010, April 8). *SOS Saúde Pública e Ambiente*. Maputo.
- Kasperson, R., Renn, O., Slovic, P., et al. (1988). *The social amplification of risk: A conceptual framework*. *Risk Analysis*, 8(2), 177-187.
- Kitzinger, J. (1999). Researching risk and the media. *Health, Risk & Society*, 1(1), 55-69.
- Lipset, S. M., & Schneider, W. (1983). *The decline of confidence in American institutions*. *Political Science Quarterly*, 98(3), 379-402.
- Luhmann, N. (1979). *Trust and power*. Chichester: John Wiley.
- Lupton, D. (1999). *Risk*. London: Routledge.
- McCallum, D. B., Hammond, S. L., & Covello, V. T. (1991, October). Communicating about environmental risks: How the public uses and perceives information sources. *Health Education & Behaviour*, 18(3), 349-361.
- National Civic Review. (1992). Opinion poll: Confidence in all levels of government is down, but local government still most trusted. 81(4), 518-519.
- Peters, R. G., Covello, V. T., & McCallum, D. B. (1997). The determinants of trust and credibility in environmental risk communication: An empirical study. *Risk Analysis*, 17(1), 43-54.
- República de Moçambique – Ministério para a Coordenação Ambiental – Gabinete do Ministro. (2010). *Informe apresentado pela MOZAL S.A.R.L. no passado dia 05 de Abril de 2010, no Centro de Conferências Joaquim Chissano*, Maputo, 14 de Junho de 2010, Eng. Maurício Xirinda.
- Rønning, H. (2009). Strengths and weaknesses: Political change and the media in Africa since the 1990s. In Rønning, H., & Orgeret, K. (Eds.), *The power of communication: Changes and challenges in African media* (pp. 25-65). Oslo: Unipub.
- Sandman, P. (2001). *Explaining environmental risk*. In <http://www.psandman.com> (accessed October 11, 2013).
- Sjöberg, L., Kolarova, D., Rucai, A.-A., Bernström, M.-L., & Flygelholm, H. (1996). *Risk perception and media risk reports in Bulgaria and Romania*. Rhizikon, Risk Research Report No. 23. Center for Risk Research, Stockholm School of Economics.
- Sjöberg, L. (1998). The rise of risk: Related bills submitted to the Swedish Parliament in 1964-65 and 1993-95. *Journal of Risk Research*, 1, pp. 191-195.
- Sjöberg, L. (2000). Factors in risk perception. *Risk Analysis*, 20(1), 1-11.
- Sousa Santos, B. de (2004). *Do pós-moderno ao pós-colonial. E para além de um e outro*. In [http://www.ces.uc.pt/misc/Do\\_pos-moderno\\_ao\\_pos-colonial.pdf](http://www.ces.uc.pt/misc/Do_pos-moderno_ao_pos-colonial.pdf)
- Sowby, F.D. (1965). Radiation and other risks. *Health Physics*, 11(9), 879-887.
- Starr, C. (1969). Social benefit versus technological risk. *Science*, 165(3899), 1232-1238.
- UNEP (United Nations Environment Programme). (2011, April 17). *Genetically modified crops in Africa*. In <http://www.eoearth.org/view/article/51cbedd77896bb431f6944ef/> (accessed September 9, 2014).
- Traynor, I. (2013, November 24). Crisis for Europe hits record low. *The Guardian*.
- World Bank. (1981). *Accelerated development in Sub-Saharan Africa: An agenda for action*. Washington, DC: World Bank.
- World Economic Forum. (2008). *Africa@Risk: A global risk network briefing*. Geneva: World Economic Forum.