



GEOETHICS¹

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First of all allow me to thanks the organization of the 1st Geology Congress of geology for having invited me to address to this audience as a key note speaker. It is a great honor for me to do it. I hope to meet your expectations.

When the invitation was done, I remained some time thinking on what to speak about. I thought something about coal, since this is my specialization, but I think that there are people enough that know more than I about coal.

During my work with the Geological Society of Africa I came in contact with a Spanish geologist, Prof. Jesús Martínez-Frías, Goodwill Ambassador of the Geological Society of Africa to Spain, who invited me to visit a Facebook page he created, entitled Geoethics (Facebook has good things too, not only a gossip site). So I did, and I found the subjects very interesting. I had the pleasure of meeting him personally during the 34IGC in Brisbane, Australia, and to attend a series of communications on Geoethics, one of them presented by him. I invite you all to visit the website of the International Association of Geoethics (IAGETH).

Thus, during the 34IGC, I had the idea to speak about this subject, since it seems very relevant and actual for our country, especially because Mozambique is a country where mineral resources are having more and more a preponderant role in our economy, and it is necessary to pay attention to a series of situations to avoid that they do not result on the curse affecting many countries, many of them from Africa.

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And I take the chance to inform you that I was honored to be the representative of the international association in Mozambique. You will have more news about me.

What I describe ahead is not a result of a profound knowledge about Geoethics (I am perfectly ignorant about that, I am not ashamed of confessing it), but a result of some thoughts I have had about these issues resulting of a series of worries I have as a consequence of these same thoughts and of observing some situations that seem to me less appropriate. I feel I have the duty to express my thoughts, for the good sake of a discussion about the topic that may help to solve many problems. I refer to an interview by Prof. Francisco Noa to Savana Newspaper, last 7th September, where he states, amongst other things, that Mozambican intellectuals have self-sensoring mechanisms and are afraid to face the political power, resigning from their responsibilities, not only to produce knowledge, but also to intervene in society to contribute to the solution of its problems. We know that generally this is true. With this my communication I hope to row against this idea about the intellectuals of this country, and I also hope it helps the geoscientists to discuss ethical issues amongst themselves, and to serve as a contribution to create a Deontological Code, under the leadership of AGMM, which urges to be approved and, who knows, leading to the creation of an Order of Geologists.

Let us go to business, then!

The recently created International Association of Geoethics (IAGETH) defines Geoethics as:

Citation: Geoethics is an interdisciplinary field between Geosciences and Ethics which involves Earth and Planetary Sciences as well as applied ethics. It deals with the way of human thinking and acting in relation to the significance of the Earth as a system and as a model. Geoeducational, scientific, technological, methodological and social-cultural aspects are included (e.g. sustainability, development, geodiversity and geoheritage, prudent consumption of mineral resources, appropriate measures

for predictability and mitigation of natural hazards, geoscience communication, museology, etc). In addition, the necessity of considering appropriate protocols, scientific integrity issues and a code of good practice – regarding the study of the abiotic world - is covered by this discipline. Studies on planetary geology (sensu lato) and astrobiology also require a geoethical approach (Nemec et al. 2012, Martinez-Frias et al. 2011, Martinez-Frias, 2008) (IAGETH Website, end of citation).

As Geosciences everybody understands, at least those here present that had training in this area. As Ethics, it seems very often that not everybody knows what that is. Since Geosciences belong to natural sciences, dealing with physical things, its definition and understanding is easier than the definition and understanding of Ethics, as it deals with moral, social, cultural and behavior concepts, which have a great subjective charge, varying from culture to culture. Thus, Ethics is defined as the part of philosophy dealing with the study of moral values and ideal principles of human behavior (2012 Priberam Informática, S.A). The word “ethics” comes from the Greek *ἠθικός*, meaning what to belong to *ἦθος*, character (TEB, 1911).

Another definition of Ethics, appearing in the Internet Philosophy Encyclopedia (Fieser, 2003) says that: the field of Ethics (or moral philosophy) involves systematizing, defending, and recommending concepts of right and wrong behavior.

The Collins English Dictionary defines Ethics as (1) the philosophical study of the moral value of human conduct and of the rules and principles that ought to govern it, (2) a social, religious, or civil code of behavior considered correct, especially that of a particular group, profession, or individual, and (3) the moral fitness of a decision, etc. (Martinez-Frías et al, 2011). Considering specifically the Professional Ethics, “they are the principles defining the rights and responsibilities of scientists in their relationship with the others and with third parties, including employers, researchers, clients, students, etc. (Chalk et al 1980, in Martinez-Frías et al, 2011).

There is an interesting small text on Geoethics, written by Velasquez et al. (2010), and that can be read at the website of the Santa Clara University (S. Francisco, Ca., USA), where the authors describe some answers given to a question of the sociologist Raymond Baumhardt, question made to people of the business world about what they thought Ethics means! It is about this I want to speak, as I think it is interesting to introduce, amongst us, the concept of Ethics and the discussions around it.

The answers given can be grouped into 5 groups: (i) Ethics has to do with my feelings saying what is right or wrong; (ii) Ethics has to do with my religious beliefs; (iii) Being ethic means obeying to the law; (iv) Ethics consists on the behavior standards our society accepts; and (v) I have no idea.

This diversity of responses makes clear that the understanding about the concept of Ethics is not consensual, and it seems that there is certain confusion between the concepts of ethics, feelings, moral, law, society, etc.

Let us consider the first response. The authors believe, correctly, that being ethic is not exactly following one's feelings, even because following one's feeling may even be anti-ethic. Just imagine the case in which I feel like doing something that deliberately makes harm to somebody else. It would not be ethical! Trying to identify Ethics with religion is also not correct, although the majority of religions is based on ethical principles (Velasquez et al., 2010). However, it is not necessary to be religious to be ethical. If that was the case, all non-believers could never have ethical attitudes and behaviors, which is not true. It does not seem also correct to identify Ethics with observation of the Law. The observation of laws that legalize aggressions to the citizens' rights (as the Apartheid laws, for instance) cannot be considered ethical, but only legal. And in the Apartheid context, ethical attitudes and behaviors would be considered illegal. In this concept we also include the liberation war which, aiming at an ethical objective, was considered illegal on the colonial context. And finally, saying that it is ethical to behave as a society accepts is also not logical. Thus, an entire society can be anti-ethical (Velasquez et al, 2010). And if we, in Mozambique, do not

pay due attention, we run the risk to go to this situation. It is frequent to hear that the traffic police tells us “to speak like a man”, that the public servant waits for the “under the table” to solve the problems. Although this intimately disgusts us, people end up accepting it and being conniving with it, because it is useless to protest, and eventually start acting the same way to see their problems solved and for not having problems. And what is considered wrong becomes normal instead of abnormal, and what should be normal is classified as stupid, idiot, strange, ET. There is then an inversion of values that becomes more or less institutionalized.

This said, what is Ethics then? According to the same authors (Velasquez et al, 2010), Ethics has two faces. First, Ethics refers to well justified standards on what is good and bad, and that define what people ought to do, normally in terms of rights, obligations, benefits to the society, justice, or specific virtues. It refers, for instance, to the standards that avoid us of stealing, violating, murdering, assaulting, slandering and defrauding, and that impel us to honesty, loyalty, decency and compassion. And what standards are these? We refer to norms related to several rights, such as right to life, liberty and privacy. Secondly, Ethics refers to the study and development of ethical standards for each of us. As said above, feelings, laws and social procedures may deviate from what is ethical. For that, it is necessary that each of us makes constantly an exam of his own standards to guarantee that they are reasonably and well fundamented.

All this said about Ethics, it is clear that it is not easy to define it, and that any definition proposed will have to take into consideration the surrounding cultural, social, political and demographic environment. And this situation is of great acuity in Mozambique, given its great cultural, racial, religious and tribal diversities. What for a group is considered correct may be considered wrong for another group, and the management of these problems is not easy. However, there are some issues that are common to all, such as not stealing, not killing, not violating, etc.

En passant, I referred above to the concept of Professional Ethics, as the principles that define rights and responsibilities of the scientists in their relationships with each other and with third parties, including employers, researchers, clients, students, etc., and this definition was proposed by Chalk et al (1980, in Martinez-Frías et al, 2011). Although the Ethics general issues are important to all of us, the aspect of Professional Ethics is what is important here. It is generally accepted that one of the ethical approaches for the decision making, amongst others, is Deontology, which refers to doing what is correct, meaning that many of the decisions made may be correct independently of the consequences they may have (Martinez-Frías et al, 2011). An example of a correct decision despite the serious economic consequences is presented by Martinez-Frías et al (2011) concerning the decision of suspending the air traffic in Europe due to the eruption of the Eyjafjallajokull volcano in Iceland in 2010. According to Alexander & Moore (2008) and Martinez-Frías et al (2011), deontology is one of the normative theories referring to what choices are morally necessary, prohibited allowed.

This leads us necessarily to say that our duties as geoscientists go deontologically far beyond our knowledge and capacities. Each of us must bear in mind that Ethics is part of his professional responsibility (Stephenson, 1997, in Martinez-Frías, 2011). This means, that our acting as professionals must bear in mind not only our knowledge, but also the way we apply it and, mainly, that we need to be aware to where we can go and to what extend we can deal with a certain problem and solve it.

There are many geoethical problems faced by each of us: as field geologists, and “office” geologists (planners, decision makers), consultants, teachers, etc. Although facing different problems, some issues are common to all. And here I refer to the content of Article 4 - Commitments to Geoethics, the Deontological Code of the Distinguished Official College of Geologists of Spain (ICOG, 2011). I refer to it because it may guide us to approve a future Mozambican Deontological Code, and because its content has a great importance to all of us. The introduction to this Code

refers to the guiding principles of the geologist profession that I cite ahead and, in my opinion, must be common to all geologists of this world.

Quote: Geology is a profession that requires scientific and technical knowledge, experience and correct judgment for its practice, serving both public and private sectors.

The geologist has a professional responsibility in relation to his client, colleagues and the College, that should be carried out on an ethical and clean way. Moreover, the exercise of his profession can bring a big impact on society, environment and spatial planning. Therefore, he is obliged to ensure that his decisions are consistent with the general and client interests and with everything related to safety, health protection, Geoethics, and sustainability.

The performance of Geologists should be governed by the principles of social responsibility, integrity and professional independence, personal dignity, truthfulness, loyalty and diligence. End quote.

Thus, with these guiding principles, the responsibilities above expressed in Article 4 are defined (quote):

- 1. To fulfill with the ethical principles, the Geologist must act with scientific integrity, good practices and adequate protocols, keeping appropriate attitudes to allow a balanced relationship between practice of Geology and the components of the abiotic world.*
- 2. The Geologist has to be aware of the importance of the technical and scientific progress for Mankind, and of his social responsibilities in the exercise of his professional activities. These progresses open many possibilities for great advances, but they can also bring ethical risks and dilemmas that must be considered (what I call “falling into wrong hands”).*
- 3. The Geologist is required to ensure social and economic developments that meet the needs of the present times without compromising the ability of future*

generations, seeking to maintain a comprehensive and integral vision in solving problems that affect our planet. This requires, in his activity, to consider the rational use of natural resources and the demands of society on the environment by avoiding the transfer of undesirable products to the environment and keeping in mind the principles of sustainability and prevention.

- 4. The Geologist must take into account the ethical needs for the protection of geodiversity and geoheritage. For this purpose, during the activities of reconnaissance and exploration of geological materials and processes, he should fight for the preservation of rocks or outcrops that may represent a unique record of the processes that occur in nature.*
- 5. The Geologist will put his knowledge and skills in mitigating natural disasters, giving priority to preventive strategies, and seeking to ensure the safety of persons and property, as well as protection of the environment. When prompted, he should cooperate with responsibility and diligently with the competent authorities in situations of risk and, if necessary, assist in the transmission of information to the society, using scientific data objectively, seriously and with rigor.*
- 6. The Geologist will evaluate the role of geological factors in the fight against poverty and, where appropriate, contribute with his knowledge to the sustainable improvement of the living conditions of the most vulnerable societies. End quote*

I invite everyone here to do a reflection on how and whether his professional activity reflects these principles and what each of us can do to make it happen.

Besides geoscientists, we have in this room people from other professions, but in one way or the other linked to the sectors of geology and mineral resources, and therefore covered by these issues of Geoethics, besides the ethical issues of their own professions. No one is exempt from ethical obligations.

I am professional of geology for 37 years, and I teach for 42 years, so I think I have enough experience to address some issues that worry me. Personally, in my daily life, I struggle often with several ethical issues.

- **As University Faculty Member**

I teach at the university for almost four decades. A great number of geologists of this country went through my hands.

As teacher of some geoscience subjects, I follow with anxiety the progressive degradation of academic preparation with which new students enter the higher education system in general, and the course of Geology in particular.

Not only there is a lack of knowledge of basic issues, inclusive of daily life, but they have also a tremendous lack of general knowledge about the world in general and Mozambique in particular.

How to manage, in a four-year degree, that these young people not only acquire the proper training as geologists, as well as a reasonable level of general knowledge and basic training for that? And allowing them to "be" in society!

Should I consider enough the training received by these young people in the university disciplines, when in my opinion that is far from desirable? Or should I simply fail all who do not manage to achieve the minimum requirement, and thereby contribute to the insufficient number of Mozambican geologists?

- **As Mozambican Geologist**

When I was President of AGMM (Geological Mining Association of Mozambique), I faced requests of Mozambican and expatriate Geologists for recommendation letters to qualify for registration at the Ministry of Mineral Resources (MIREM), to allow them to sign projects, as required by the ministry. I imagine the current president of AGMM faces the same.

With regard to geologists graduated in the Department of Geology of Eduardo Mondlane University, it is easy. The course is recognized by the Ministry of Education, and AGMM has no power to say yes or no. It is not an Order but an Association.

Regarding graduates in other universities the problem is solved in the same way, as long as the applicants present certificates for the respective courses. But here there is another problem: according to the law, these geologists must have an equivalence recognized by the Ministry of Education. And this process takes months, when processes are not lost. Theoretically, AGMM can only issue such a letter if such equivalence exists. But it never comes. Moreover, the Ministry of Labor issues working permits to expatriates without asking references to AGMM or without equivalences issued by the Ministry of Education.

These questions may seem only of bureaucratic nature, but they are not. There are ethical issues here involving the relationship between national and expatriate geologists. How many expatriate geologists are working today in our country, without certified credentials? We've had bad examples, and there is no guarantee that this does not happen again. We must rectify this.

- **As Consultant**

Sometimes there are reports that come to my hand, and produced by some colleagues and that are a real affront to ethics and the good name of the profession of Geologist.

There was recently a case in which my name appeared as a consultant of a team that made an environmental impact study, which was disapproved by the Ministry of Environment (MICOA). I did not know my name appeared on the team, and only knew because someone with access to the study warned me.

Both situations are serious, and if Mozambique had an Order of Geologists, they would be denounced and the profession licenses would be cancelled.

- **As Mozambican Citizen**

I note with great concern the frantic race for natural resources of this country, sometimes without caring about the necessary environmental issues, the conditions under which exploitations should be taken, the respect for the rights of affected

citizens, as well as the benefits that these resources should bring to us, Mozambicans in general, and to the country, in general.

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I gave some examples in which ethics, and especially Geoethics, is involved and that are the daily life of our profession.

It is urgent to have a thorough discussion on these issues between us, geoscientists through AGMM, and the Government, towards its cure as urgently as possible. Some aspects may have a more immediate resolution, others at a more long term. But we need to roll up our sleeves and move forward.

I throw the challenge to AGMM to lead this process as quickly as possible because time is short. And from my side I can assure the support of the International Association for Geoethics (IAGETH) for the activities to be pursued in this field in our country. And Mozambique, being the only African country so far represented on this international association, we surely have the honorable and arduous task to lead the process, if not at continental level, at least at a regional level.

I'm sure that many of you will find these issues a Utopia, and that what is intended is the subject of dreams. But what is Man with no dreams? Life would be meaningless. As the poet António Gideão sings in his famous song *The Philosopher's Stone*: "When a man dreams, the world jumps and moves forward!" Let us dream for our world to move forward.

Thank you!