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# A Multicriteria Decision-Making Analysis of the Roşia Montană Gold Mining Project

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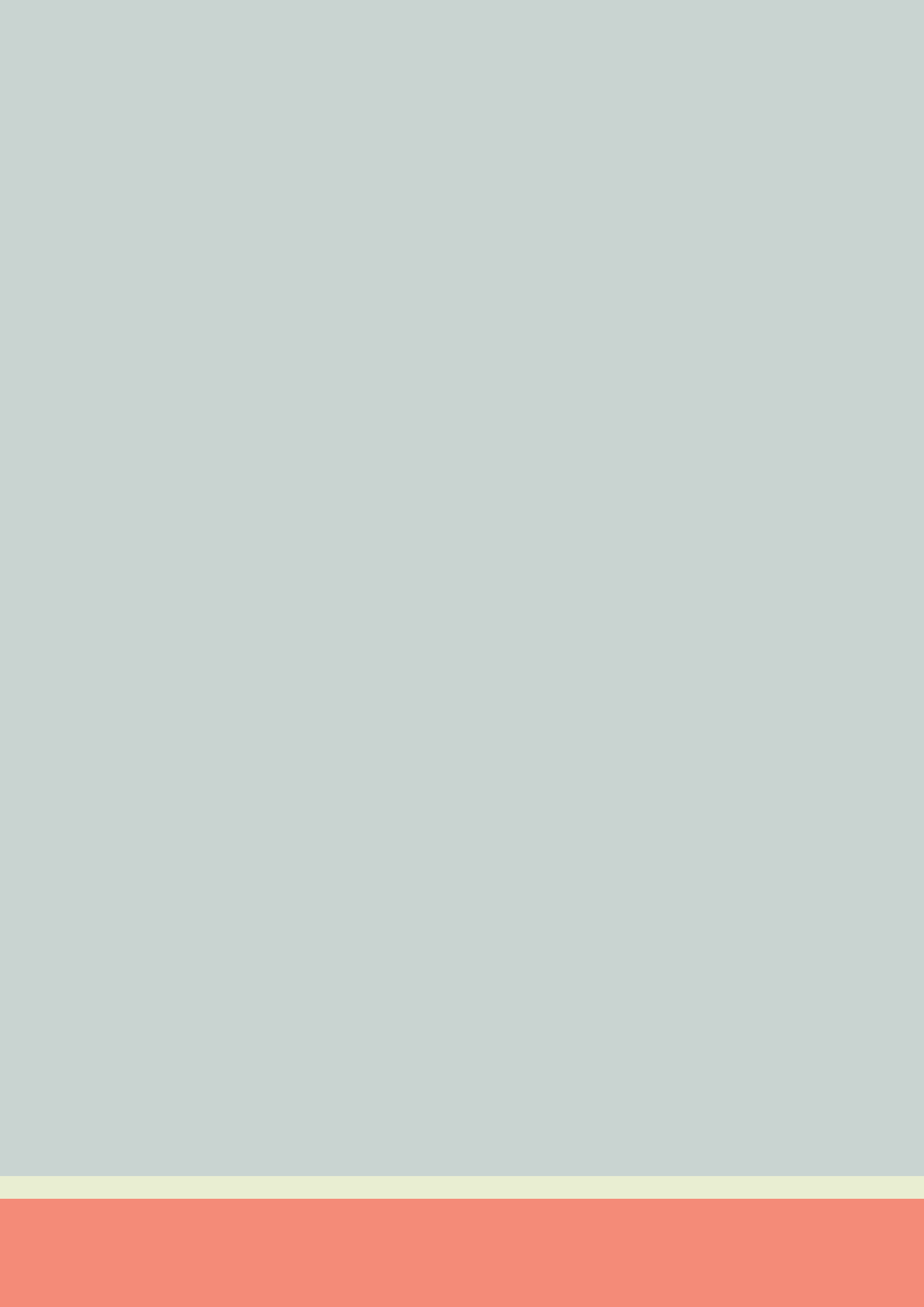
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# INTRODUCTION

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The object of the present research work conducted by MRC – Median Research Centre, for the eGovlab at the Department of Computer and System Sciences at Stockholm University, is a decision analysis of the Roşia Montană gold exploitation case and an IT-supported modeling of public decision making. The need and estimated utility for a structured analysis of the available data concerning the Roşia Montană case are palpable in the Romanian public sphere; in the last 15 years, strong debates and tensions between citizens, journalists, Presidential, Government and Parliament representatives, civil society actors and corporate officials have taken place, as all stakeholders have provided often conflicting information and opinions on the benefits and risks posed by a cyanide exploitation of gold and silver minerals from the Apuseni Mountains, by a Canadian majority-owned company. The project has taken some steps forward, but it is still awaiting legal and environmental approvals from the Romanian Government, delay which has a bearing upon the Roşia Montană village and community, as well as on the investments made so far by the company. Romanian policy makers are still facing visible setbacks in taking a decision regarding the exploitation, while the company is currently pushing for a resolution through “positive dialogue with decision makers”<sup>1</sup>.

The Roşia Montană project refers to the plans of exploring and processing of gold and silver minerals from the Roşia Montană area in the Apuseni mountains, Romania, using a technology based on cyanide leaching, by the exploitation licence holder, S.C. Roşia Montana Gold Corporation S.A. (to be referred to as RMGC). The main shareholders of the company are the mining state company Compania Naţională a Cuprului, Aurului şi Fierului “MINVEST” S.A. Deva,<sup>2</sup> with 19.31%, and Gabriel Resources Ltd. based in Canada, with 80.69% shares. Mainly due to the failure to comply with the Romanian legislation on environment issues, the company has not obtained all the needed permits to begin the exploration.

Ever since the exploitation licence was granted in 1999 to the National Copper, Gold and Iron Company “MINVEST” S.A. Deva, and was further transferred to the newly created RMGC in 2000, the project has been promoted by the company through institutional lobby and extensive PR campaigns in the media for its potential economic, social and cultural benefits for the local community and the Romanian state. After a series of renegotiations

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<sup>1</sup> Gabriel seeks amicable resolution over mining dispute, Press Release, January 20, 2015.  
[http://gabrielresources.com/documents/GBURelease\\_Amicableresolutionsought\\_200115.pdf](http://gabrielresources.com/documents/GBURelease_Amicableresolutionsought_200115.pdf)

<sup>2</sup> former Regia Autonomă a Cuprului Deva, until 1998

of the unprofitable conditions stipulated in the initial licence agreement, the Government of Romania estimates a direct benefit of nearly 5.2bn USD, which includes gold and silver royalty, dividends for the Romanian state as a shareholder, income tax, and social contributions for employees.

However, the environmental risks of cyanide-based explorations, the threat posed to the cultural heritage and other industries in the area, the forced expropriations and several i suspicions of corruption, illegalities and overall lack of transparency of the state-company agreements stirred serious citizen and non-governmental organizations' opposition to the project. Legal actions have been taken by several opposing villagers' NGO, Alburnus Maior, against a number of environmental and archaeological permits given by county institutions and ministries; furthermore, initiatives aiming to raise awareness and civic participation have been taking place both in Roşia Montană, mainly through the activist theatre and music festival FânFest, and throughout the country, where public debates, art exhibitions and investigations were organized by universities and other research institutes, activists and journalists. The peak of citizen opposition to the project was the widespread protests in the fall of 2013, triggered by a draft mining bill advanced by Prime-minister of Romania and the ruling coalition at the time, the Social-Liberal Union, which would have created a more suitable legal framework for the project to commence. Counteracting the mainstream media silence on the subject, valuable data and previously classified material such as the 1999 exploitation licence surfaced online and became increasingly visible and discussed.

Nonetheless, the opinions among citizens remain divided. A national referendum was suggested by the President of Romania in 2013, but the proposal was rejected in Parliament. An opinion poll commanded by a news publication and conducted in September 2013 showed that 95% of the Romanians followed the reports on the subject. 52% of the respondents stated that only through the continuation of the Roşia Montană mining safe jobs can be secured for the local community, while 35% believe that the area can develop through tourism, if the project falls<sup>3</sup>.

The controversy of the project has led the Romanian officials to treat it with caution in the electoral campaigns held in the last decade, their discourse oscillating between reinforcing Romania's need of economic benefits out of its natural resources and stating their disapproval of the cyanide exploration. Although some members of the ruling parties and

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<sup>3</sup> Catalin Augustin Stoica, "Opinia publica despre Proiectul Rosia Montana si Gazele de sist", 11 decembrie 2013, Voxpublica, <http://voxpública.realitatea.net/politica-societate/opinia-publica-despre-proiectul-rosia-montana-si-gazele-de-sist-101065.html>

ministers support the project, others are still reluctant in reaching a definitive conclusion. The postponement of the decision regarding the commencement of the exploration can be motivated by the current legislative impediments, the lack of clarity regarding the multiple arguments on both sides and the citizen opposition to the project.

The current report, supported by the University of Stockholm<sup>4</sup> in collaboration with Median Research Centre, Bucharest, represents a first attempt to systematize the main arguments issued by the stakeholders (RMGC, the Romanian officials, the civil society, the local community, experts and citizens). We believe that the most appropriate method of analysis and evaluation of the available data, for establishing which option is the most suitable for a sustainable development of the Roşia Montană area, is a multi-criteria decision-making model<sup>5</sup>. As we will see below, this scientific method can serve the Romanian decision makers in the process of weighing the data for reaching a definitive and objective conclusion.

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<sup>4</sup> This research was funded by the Swedish Research Council FORMAS, project number 2011-3313-20412-31, as well as by Strategic funds from the Swedish government within ICT—The Next Generation.

<sup>5</sup> Multi-criteria decision-making analysis (MCDA). A se vedea și Mihai, A.; Marincea, A.; Ekenberg, L. A MCDM Analysis of the Roşia Montană Gold Mining Project. Sustainability 2015, 7, 7261-7288.

## SHORT HISTORY OF THE DECISION-MAKING PROCESS

Median Research Centre followed the major steps taken in the Roşia Montană case by the main parties involved<sup>6</sup>, from official agreements and permits, to political statements which either pushed the project forward, or blocked it due to the political, social or environmental risks.

**1995:** Gabriel Resources NL wins the auction organized by the state-owned company Regia Autonomă a Cuprului Deva for a joint venture in exploiting the old tailings at Roşia Montană and Gurabarza – Brad; the documentation shows that the auction was won on September 4th, however the official release in a public newspaper of the bid by the Romanian company was issued on September 5th.

**1997:** Listing Gabriel Resources on the Vancouver stock market, with the approval of the Ministry of Industry and Commerce<sup>7</sup>; Gabriel Resources Limited and Regia Autonomă a Cuprului Deva become formally associates in the Romanian company Euro Gold Resources, which later becomes S.C. Roşia Montana Gold Corporation S.A. In the association agreement, a sum of 9 million USD is stipulated as investment made by Gabriel Resources Limited for research and feasibility studies, with the purpose of „identifying the quantities and quality of the deposits within the perimeter”<sup>8</sup>.

**1998:** Romanian Government adopts the new mining law no. 61/1998. In December 1998, the license agreement for the exploitation of the deposits within a limited perimeter in Roşia Montana is given to state-owned National Company of Copper, Gold and Iron “Minvest” S.A (former Regia Autonomia a Cuprului Deva), while the joint venture Euro Gold Resources remains „affiliate”;

**1999:** The license agreement is validated through a governmental decision no. 458/1999, signed by the then Prime-minister, Ministry of Industry and Commerce, Ministry of Finances and the director of the National Agency for Mineral Resources. The license agreement –

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<sup>6</sup> Raluca Toma, Timeline Roşia Montană, November 3rd 2013, <http://www.openpolitics.ro/Roşia-Montană/timeline-Roşia-Montană.html>

<sup>7</sup> Later on and to the present day, the company is listed on the Toronto stock market.

<sup>8</sup> License agreement for the concession of gold and silver resources in Roşia Montană justification and governmental decision, 31.05.1999, [http://gov.ro/fisiere/stiri\\_fisiere/licenta-de-concesiune.pdf](http://gov.ro/fisiere/stiri_fisiere/licenta-de-concesiune.pdf)



including the exact location and perimeters for exploitation - and its additional contracts remain classified, according to the Romanian law, until 2013, when they are leaked to the press.

**2000:** The transfer of the exploitation license from the National Company of Copper, Gold and Iron "Minvest" S.A to the joint venture S.C. Roșia Montana Gold Corporation S.A. is approved by the National Agency for Mineral Resources and by the Government.

Meanwhile, home and land owners in Roșia Montană opposing the mining project associate and form an NGO, Alburnus Maior, which will be a leading active voice and watchdog for defending the right to property, the conservation of the natural landscape in the area and the legality of permits issued by local or national institutions on the topic.

**2001-2002:** Roșia Montana Gold Corporation releases the first feasibility study for the Roșia Montană exploitation, after 4 years of geological research and geo-technical drillings in the area. The proposal for exploitation consists of 20 million tons of minerals to be annually processed in 4 open pits from massifs Cetate, Cărnic, Jig-Vaidoia and Orlea, with „average contents of 1.46g/t Au and 6.9g/t Ag, representing 10.1 million ounces (314 t) Au and 47.6 million ounces (1480 t) Ag - in situ metals”<sup>9</sup>. The technological process involves blasting the pits, cyanide leaching of the ore in a process plant, and releasing the neutralized sodium cyanide in a tailings management facility, behind a dam made of rock. The area licensed for the company consists of 2388 ha, out of which 1346 ha are destined for exploitation and 300 ha for the tailings management facility and dam. The exploitation presupposes the relocation and displacement of 960 families from three villages – Roșia Montana, Corna and Gura Cornei, houses and cemeteries, the destruction of four massifs and natural landscapes, buildings and churches<sup>10</sup>. A plan for displacement and relocation is open for public and private debates between the representatives of Roșia Montana Gold Corporation and the impacted local families.

**2002:** The right-wing Greater Romania Party submits a motion opposing the project in Parliament and opens the debate surrounding the legality of the license procedures. The motion asked for: a ban against gold cyanidization and a turn to environmental-friendly mining technologies; respecting the right to property of the local citizens; a correct and

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<sup>9</sup> Roșia Montană Gold Corporation, Geology of Roșia Montană, <http://en.rmgc.ro/Roșia-Montană-project/geology.html>

<sup>10</sup> Roșia Montană Gold Corporation Memorandum, 2004. [www.mmediu.ro/protectia\\_mediului/Roșia\\_Montană/pdf/memoriu\\_prezentare.pdf](http://www.mmediu.ro/protectia_mediului/Roșia_Montană/pdf/memoriu_prezentare.pdf)

transparent process of public informing on the project. The Ministry of Industry and Commerce takes a favorable position, by signaling that the resources should be exploited; while the method is still up for debate, he argues that „utilizing cyanide in processing the gold and silver ore with low concentration is the most widely used method around the world”. Issues such as social and environmental costs and risks, the lack of previous mining experience and successful exploitations conducted by the investors, the destruction of roman archeological traces, the lack of financial guarantees for the implementation and safe closure of the project, were discussed in plenary<sup>11</sup> in the Chamber of Deputies. The motion was rejected with 65 votes for and 188 votes against, among the latter being deputies from the Democrat Party, the National Liberal Party and the Democratic Union of Hungarians in Romania. Alburnus Maior NGO launches the campaign „Save Roșia Montană” against the project and its impact on the environment, on the cultural heritage (ancient galleries, heritage buildings), as well as on the local community and property owners.

**2003:** Prime-minister asks the Parliament to appoint a Special Committee to assess the Roșia Montană project risks and advantages. By decision no.8/2003, the 13 members committee is supposed to „formulate a unitary viewpoint concerning the economical, social, cultural and environmental aspects implied by the project”<sup>12</sup>. Two months later, the Committee publishes a report<sup>13</sup> which reinforces the economical benefits for the Romanian state, estimated at 583 million USD, and assures the wider public that no legislation breaches were observed in the license agreement or in the activity of the company up to that point. In spite of the positive note of the report and of its favorable reception in the local press, two members of the committee released separate statements, however, drawing attention on the insufficient data gathered in a short timespan, on the questionable debates format, as well as on the lack of transparency of the Parliamentary hearings, where the press was not allowed access. Prime-minister Adrian Nastase declares, based on the committee report, that he is „skeptical” about the chances of the project to be implemented, due to the high environmental risks.

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<sup>11</sup> Chamber of Deputies Session, Debate on the Roșia Montană simple motion, signed by 71 deputies. December 10th 2002. <http://www.cdep.ro/pls/steno/steno.stenograma?ids=5367&idm=11&idl=1>

<sup>12</sup> Hotărârea nr. 8/2003 pentru constituirea Comisiei comune speciale privind efectuarea unei analize asupra Proiectului de dezvoltare minieră Roșia Montană

<sup>13</sup> The report is no longer available for public consultation, but statements issued by the 2003 special committee members can be found in the media – Veronica Marinescu, Desi Raportul Comisiei parlamentare nu da unda verde investitiei, autorii proiectului „Roșia Montană” se si vad castigatori, Curierul National, June 12th 2003 <http://www.curierulnational.ro/print/15612>

**2004:** Ministry of Culture approves the certificate of archeological discharges for the Cărnic massif, legal document necessary for the exploitation of a protected natural heritage site.

**2004 presidential elections:** candidate and prime-minister Adrian Năstase reinforces his opposition to the project, declaring that the gold will be taken away, leaving instead the cyanide tailings; candidate and mayor of Bucharest at the time Traian Băsescu (who won the presidential elections and stayed in office until november 2014) supports the project for its value and job-creating potential. At the same time, the new Ministry of Environment announces her refusal to issue any environmental permits for the project.

**2005:** Diplomatic meetings between the Romanian and the Hungarian prime-ministers and ministries of environment; the Hungarian Ministry of Environment opposes the project and advises the Romanian side to ask for an impact assessment study.

**2002-2006:** Feasibility studies, research and consulting conducted by the company and national and international experts for drafting the documentation needed for legal approvals; submitting the Environmental Impact Assessment for the Roșia Montană Project<sup>14</sup> to the Ministry of Environment and for public debate; finalizing the General Urbanism Plan for the Alba county and the Zonal Urbanism Plan for the Roșia Montana village, both including the project activities. The approvals of the urbanism plans are mandatory for the project development.

**2002-2004 and 2006-2008:** The company purchahses properties in the villages to be affected by the project.

**2006:** The Ministry of Environment releases the Environmental Impact Assessment for the Roșia Montană Project for public debates, making the documentation available online and for request. Roșia Montana Gold Corporation takes part in 16 public consultations in Romania and Hungary and receives 5600 questions on the data from the EIA, to which the company responds through the Ministry of Environment website, in 2007<sup>15</sup>. The answers are available online, as an annex to the EIA.

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<sup>14</sup> <http://en.rmgc.ro/Roșia-Montană-project/environment/environmental-impact-assessment.html>

<sup>15</sup> Ministry of Environment, Roșia Montană documentation, [http://www.mmediu.ro/protectia\\_mediului/Roșia\\_Montană/Roșia\\_Montană.htm](http://www.mmediu.ro/protectia_mediului/Roșia_Montană/Roșia_Montană.htm)

**2008:** Roşia Montană Gold Corporation sues the Ministry of Environment and its Secretary of State for unjustifiably refusing to issue the permits for the dam construction at Corna and Cetate. National and international organizations Greenpeace, Alburnus Maior and the Independent Center for the Development of Natural Resources offer their legal support and expertise to the Ministry. In 2009, the Bucharest Court of Law rejects the legal action taken by the company, in favor of the Ministry.

**2009 presidential elections:** the socialist-democrat candidate Mircea Geoană declares that as long as the project threatens the environment and the principles of sustainable development, he will oppose it. President in office and candidate Traian Băsescu avoids political statements on the projects, leaving the decision in the hands of experts. However, he restates his position regarding the exploitation of resources, namely that it should be done, in principle, but without irremediably jeopardizing archeological sites and the environment. Roşia Montană Gold Corporation inaugurates Recea, the newly built neighbourhood in Alba Iulia city, destined for the 125 families who have agreed upon relocating.

**2009:** Provisional Ministry of Economy includes the project on the agenda of the newly formed government, announcing his intent to accelerate the commencement of the exploitation. Ministries of Culture and of Environment declare that in the lack of guarantees and more extensive research, they would not give the necessary permits.

**2010:** A seminar on the Roşia Montană project entitled „Making Europe a leader in sustainable and responsible mining”<sup>16</sup> was organized at the European Parliament in Brussels by liberal MEP in collaboration with Gabriel Resources Limited. The event was severely criticized for not inviting MEPs or experts opposing the project and the National Liberal Party had to issue a statement reminding the public opinion that, during its governmental mandate, the project was blocked due to a cost-benefit analysis revealing the unprofitability of the project for the Romanian state. The European Parliament adopts an anti-cyanide use resolution, advising the ban of cyanide mining in the European Union. Among the supporters of the resolution are two Romanian MEPs. Meanwhile, the company obtains a renewed urbanism certificate and the Ministry of Environment resumes the evaluation of the Environmental Impact Assessment.

**2011:** Conflicting opinions: while the prime-minister declares that the agreements made between the Romanian state and the company are not in the best interest of the state,

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<sup>16</sup> <http://www.nineoclock.ro/Roşia-Montană-scandal-liberals-reject-accusations/>

the President declares that the project „needs to be done” after a renegotiation of the state benefits and that the government must have the courage to assume responsibility. Opposition leaders (among which the present-day prime-minister) criticize the President’s involvement and reject the project. Opposition parties launch their vision for a sustainable development which includes mandatory measures for the Roşia Montană case: declassifying the agreements, independent cost-benefit analyses, identifying the most appropriate technology for the exploitation, taking into consideration the EP anti-cyanide resolution, respecting the right to property of the villagers. The Ministry of Environment negotiates the lowering of the concentration of cyanide with the company, and the Ministry of Economy offers its full support for the project. The company sponsors an extensive archeological research and conservation program of the ancient roman galleries, in collaboration with the National Museum of History and with other research institutions.

**2012:** Newly appointed social-democrat prime-minister mentions three conditions for getting on with the project: environmental safety guarantees, renegotiating the state shares within Roşia Montană Gold Corporation and putting an end to the lobby influencing the political decision. The Ministry of Economy announces the local community that the project is set to start and that a favorable decision will be made by the end of the year. Prime-minister infirms the statement, mentioning that a decision will not be taken by the end of the year, continuing the chain of contradictions in statements coming from the same government. Ministry of Environment asks for a declassification of the license agreement. Along with Parliamentary elections, the Alba county organizes a referendum asking the citizens of 35 villages and towns whether they agree with the company project or not. While 62,45% of the votes chose „yes” and 35% voted against the project, the referendum failed to be validated due to lower than required turnout, with only 43,20% of citizens with a right to vote casting the ballot.

**2013:** The project is put on the agenda of the Ministry of Infrastructure and National Interest Projects and statements are released in favour of the project and against the opposing NGOs, political leaders supporting the „reindustrialization” of Romania. New mining bill is drafted by the government and submitted to the parliament: mining projects become of „public utility and national interest” addressing the constitutional condition which stipulates that „no one can be expropriated unless it is for a public interest cause, set by law and with just compensation”. The mining bill also includes renegotiations of the state participation in the company, the shares raising from 19.31% to 25%, as well as an increase of the state benefits from royalties, from 4% to 6%. The Ministry of Justice gives a negative vote for the mining law, invoking unnecessary limitations of the citizen rights, ambiguous wording and unconstitutional breaches in issues concerning expropriation and perimeter delimitations.

Rise Project (independent investigative journalism) publishes the license agreement and its additional contracts, followed by other documents released on the Ministry of Economy website. Proofs of irregularities emerge and street protests against the draft law take place all over the country, from September 1st. Following the street pressures, president of the Senate and leader of the National Liberal Party takes the side of the protesters. Prime-minister subsequently declares the project closed and the victory of the street and civil society, stating his intention of quickly rejecting it in an emergency vote in Parliament due to an obvious majority opposing it. His statement makes Gabriel Resources Limited stocks on the Toronto stock market drop with 51%, the company releasing a statement by which the Romanian state is being threatened with "litigation for multiple breaches of international investment treaties for up to \$4-billion"<sup>17</sup>. Following the corporate reaction, PM announces they have reconsidered the initial rejection of the draft law, proposing instead a Special Commission appointed by the Parliament to hear out all the stakeholders involved, along with NGOs, citizens, independent experts and journalists, local and national authorities and representatives of the company.

**2014 presidential elections:** Looking at their electoral agendas, it seems that the 6 most visible candidates are divided when it comes to the Roșia Montană project: Monica Macovei and Călin Popescu Țăriceanu are neutral, Elena Udrea is more pro-development of the project and Victor Ponta, Klaus Iohannis and Kelemen Hunor are more anti-development of the project<sup>18</sup>. There is obviously still no consensus on what decision should be made in this case and the political risk is high in assuming a definitive position.

The National Agency for Mineral Resources announces upcoming auction for the concession of new perimeters for exploration, four of which contain gold and silver deposits.

**2015:** Gabriel Resources Limited issues a formal notification to the President and Prime Minister of Romania calling for a formal engagement in a process of consultation, seeking an „amicable resolution to this dispute which will lead to the development of the Project for the benefit of all stakeholders”.

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<sup>17</sup> Gabriel threatens Romania with billion-dollar lawsuit, The Globe Mail, September 11, 2013 <http://www.theglobeandmail.com/report-on-business/international-business/european-business/gabriel-resources-ceo-vows-to-sue-if-romania-kills-europes-biggest-gold-mine/article14240950/>

<sup>18</sup> According to the data gathered by Median Research Centre for the application TestVot Presidential Elections 2014. The application is available here <http://www.openpolitics.ro/testvot>, and details on the methodology employed are here: <http://www.openpolitics.ro/noutati/homepage/tot-ce-ai-nevoie-sa-stii-despre-testvot-prezidentiale-2014.html>

Throughout the years, there has been no consensus on the future of the project within a single party. Think-tank România Curată (Clean Romania) lobbying against corruption, for parliamentary transparency and the rule of law, published a list of 43 well known public officials who have supported the mining project through favorable actions and statements in ministries or parliament. The officials came from all major parties which have been part of the ruling coalitions of the past 15 years.<sup>19</sup>

The final report issued by the Special Parliamentary Commission in November 2013 includes pro and against arguments issued by the main emittents of reports, laws and permits for the Roșia Montană project, serving as a good starting point for a multicriteria decision analysis which takes into consideration the multiple stakeholder point of views. The committee conclusions recommend the rejection of the bill (which took place in Parliament the following months), as well as the following: a) fair partnership conditions between the majority shareholder and the Romanian state-owned company, respecting compulsory community norms and the principles of sustainable development in the areas where the project will be put into execution; b) real improvement and larger economic benefits after the renegotiations of the initial agreement; c) a careful reexamination of alternative scenarios on mining exploitation royalty and contribution rate-setting; d) a throughout investigation of the legality of actions within the project; e) a necessity of broader legislation on gold and silver alloy mining projects to be debated by parliament so as to enable mining development in Romania and investments.

## MAIN STAKEHOLDERS

Roșia Montana Gold Corporation S.A., with main shareholder Gabriel Resources Limited (80,69% shares). According to the Annual Information Form of Gabriel Resources Ltd. for the year 2013, the company is registered in Yukon, Canada, and operates through its subsidiaries in London, Bucharest, Roșia Montana and Brussels. The company presents itself as having a single focus, namely “permitting and developing its world class Roșia Montană gold and silver project”<sup>20</sup>. Besides the exploitation license for the Roșia Montana gold and silver deposits, the company also owns, through its Romanian subsidiary, an exploration concession for gold, silver and copper deposits in Bucium, within the same county.

<sup>19</sup> <http://www.romaniacurata.ro/captura-statului-la-purtator-43-de-nume-sonore-pe-lista-neagra-a-exploatarii-Roșia-Montană/>

<sup>20</sup> <http://www.gabrielresources.com/site/index.aspx>

Below we can see the inter-corporate relationship between the Company and its subsidiaries, as well as the percentage of ownership held by the Company in each and the minerals owned:

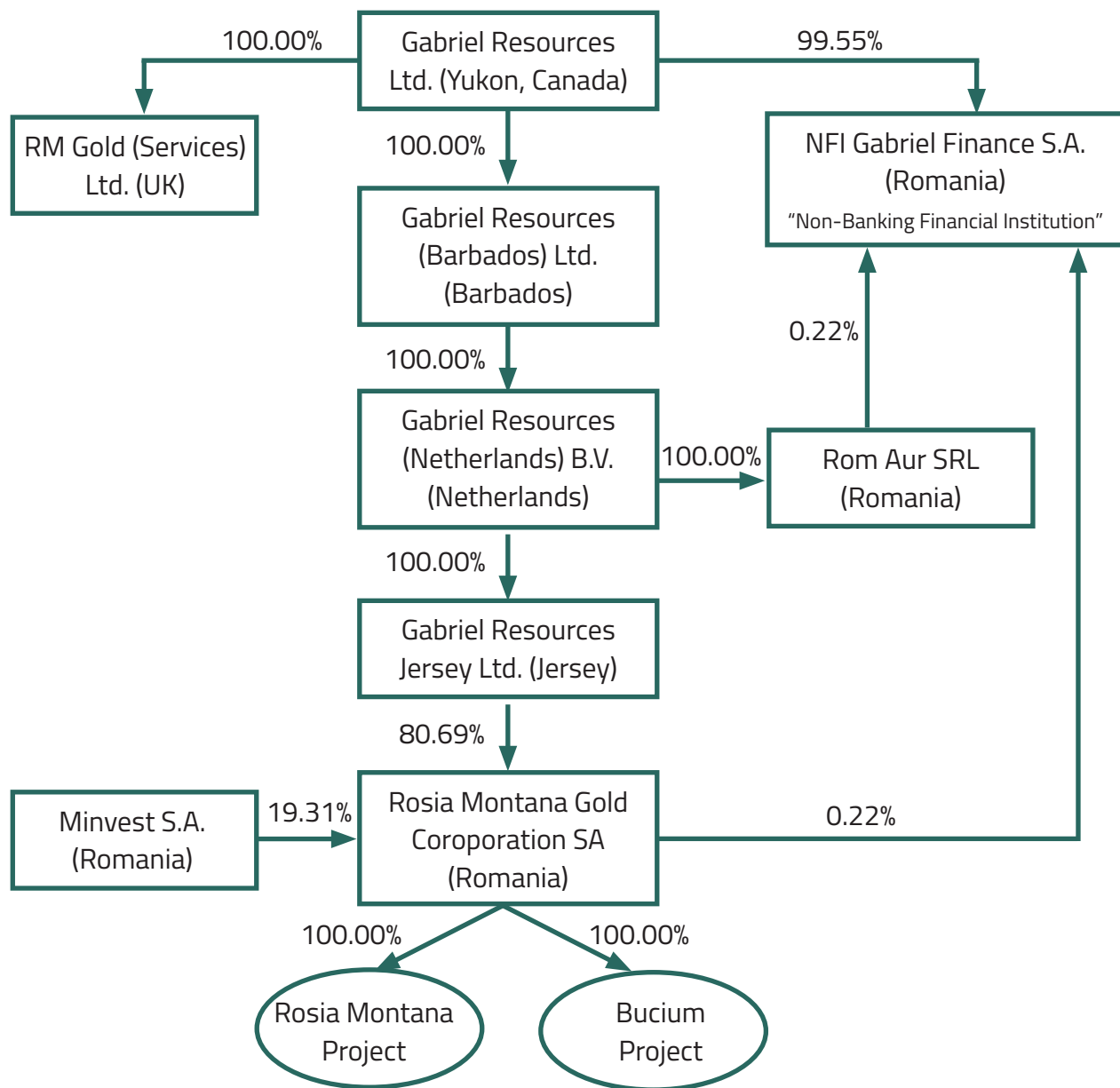


FIGURE 1. Stakeholder scheme, Roşia Montană Gold Corporation S.A.  
 Source: Annual Information Form of Gabriel Resources Ltd., March 12, 2014, p. 6



Gabriel Resources Ltd. has made, between 1997 and 2013, investments of 550 million USD, according to their statements to the 2013 special parliamentary committee. The major areas of investments focused on: geological research (98 million USD), cultural heritage research and preservation measures (28 million USD), displacing sites (50 million USD), property acquisition (105 million USD), taxes and fees (50 million USD), mining equipment (55 million USD), technical studies (90 million USD), general and administrative costs (74 million USD). No official documentation was submitted to justify the sums; the media released further expenses made by the company for lobbying, PR and advertising (millions of € cf. 2013 special committee, p. 15).

The state-owned company MINVEST (19,31% of shares) has made no investments in the project, as it was stated in the agreement between the Romanian side and the investors. The company also owns 19% of another joint venture for mining activities, Deva Gold S.A., whose main shareholder is Eldorado Gold Corporation (CA). Deva Gold, whose director is the former director of MINVEST, owns two exploration licenses for perimeters in the neighbouring county Hunedoara, at Certej, 90 km from Roșia Montana. The mining project at Certej has very similar initial agreements with the Romanian state<sup>21</sup> and plans to use cyanide in order to extract gold and silver as well; however, in 2005, the company decided to change the technology from leaching (total cyanidation, technology chosen by Roșia Montana Gold Corporation) to flotation, process which diminishes the quantity of cyanide used per year to 1,653 tons, in contrast to 12,000 tons/year, volume required by the leaching process.

There are several other licenses for exploration in the Apuseni Mountains, released by the National Agency for Mineral Resources; the projects propose open-pit mining, and are in different stages of development, from estimating the quantities of ore in the deposits to awaiting environmental and exploitation permit approvals.

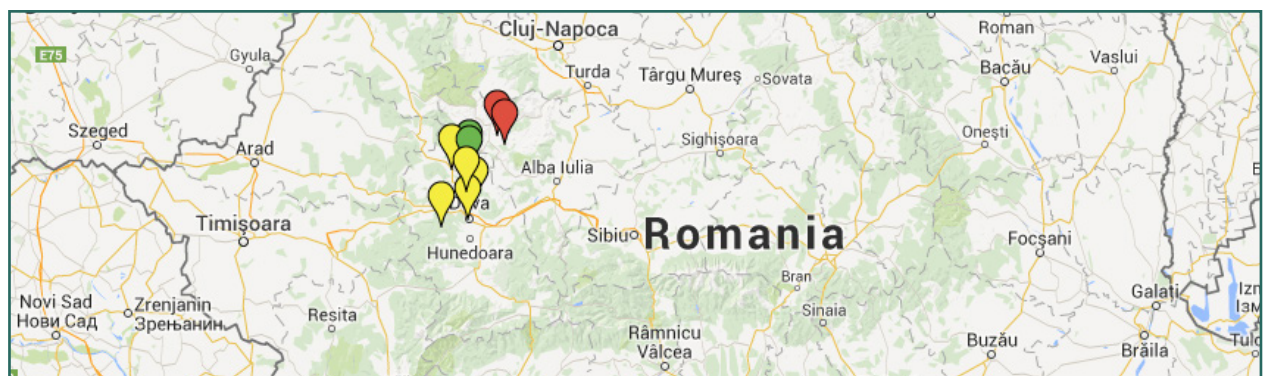


FIGURE 2. Main perimeters for gold and silver exploration licenses, Apuseni Mountains  
Red: Roșia Montana Gold Corporation S.A. Green: Samax Romania S.A. Yellow: Deva Gold S.A.

<sup>21</sup> Afacerea aurului: Deva Gold extinde proiectul Certej, Rise Project, October 31st, 2014. <http://www.riseproject.ro/afacerea-aurului-deva-gold-extinde-proiectul-certej/>

**Table 1. Mining licenses in Romania and the main shareholders**

Project name	Company	Main shareholders	License type
1. Roșia Montană	Roșia Montană Gold Corporation S.A.	Gabriel Resources Ltd. (CA) și Minvest (RO)	exploitation
2. Bucium	Roșia Montană Gold Corporation S.A.	Gabriel Resources Ltd. (CA) și Minvest (RO)	exploration
3. Certej	Deva Gold S.A.	Eldorado Gold Corporation (CA) și Minvest (RO)	exploitation
4. Brad	Deva Gold S.A.	Eldorado Gold Corporation (CA) și Minvest (RO)	exploration
5. Muncel	Deva Gold S.A.	Eldorado Gold Corporation (CA) și Minvest (RO)	exploration
6. Deva	Deva Gold S.A.	Eldorado Gold Corporation (CA) și Minvest (RO)	exploration
7. Băița-Crăciunești	Deva Gold S.A.	Eldorado Gold Corporation (CA) și Minvest (RO)	exploitation
8. Rovina-Câlnic	Samax Romania S.A.	Carpathian Gold (CA)	exploration
9. Cireșata	Samax Romania S.A.	Carpathian Gold (CA)	exploration

Along with the state-owned company Minvest, the first seven projects listed above are of interest to the shareholders of the Canadian companies as well. All companies are listed on the Toronto stock market and have common shareholders, hedge funds such as Van Eck Associates Corporation, Baupost Group LLC or Fidelity Management and Research Company. Positive political statements and permit approvals regarding the Roșia Montană project have influenced the quotation of the companies, while negative events such as the 2013 protests and rejection of the draft bill have severely affected the stocks value.

Since the National Agency for Mineral Resources announced future auctions for other perimeters containing gold and silver deposits, the decision taken in the Roșia Montană case could be a precedent for future negotiations and developments in other projects of mining in Romania.

The documentation we consulted issued by RMGC includes the Environmental Impact Assessment reports, infographics, maps and other summaries of the project available on their website, as well as their hearings in front of the 2013 Special Committee. Also, in order

to have more insight on the company project and on the impacted area of the eventual exploitation, we went to Roșia Montană<sup>22</sup> and were able to speak to the spokesperson of the company, Mr. Cătălin Hosu, who presented the sites in focus and explained the technological process implied by the project, as well as the investments made in the preservation of cultural heritage and in a pilot project of filtering out the acid waters. The conversation confirmed the information put forward by the Company in their official data, but it also failed to clarify the question marks regarding the lack of financial guarantees<sup>23</sup>, the risks associated with setting the tailings management facility on Corna Valley (which is likely to contain geological faults, according to the National Institute of Geology), the inherent risks associated with cyanide leaching (even if considered BAT – best available technology) and the negotiations with the families refusing to relocate.

## The Romanian state

Following the accession to the European Union, the Romanian state could no longer subsidize the mining activities of state-owned companies; after the fall of communism, the state was confronted with a typical deindustrialization period, which led to significantly lower production in several industries, including mining. Data shows that out of 14 mining regions across the country and aprox. 65,000 direct and indirect jobs in the non-energy mining, only 2000 employees are currently paid from governmental funds<sup>24</sup>. Significant unemployment rates have had social and economical impacts in the affected areas where mining activities have been ceased.

After 1989, the National Agency for Mineral Resources released a number of exploitation licenses to state companies, which partnered with foreign investors, such as in the Roșia Montană case. Another joint venture was created between the state company Remin (which decreased its employee number from 30,000 during communism to

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<sup>22</sup> September 2014

<sup>23</sup> Mandatory requirement, according to EU Directive 26/21/EC, art. 25

<sup>24</sup> Infographic, Mining in Romania from decline to rebirth, Hotnews.ro, January 15th 2013, sponsored by Roșia Montană Gold Corporation S.A. [http://www.hotnews.ro/stiri-Roșia\\_Montană\\_social-14009179-infographic-mineritul-romania-declin-renastere.htm](http://www.hotnews.ro/stiri-Roșia_Montană_social-14009179-infographic-mineritul-romania-declin-renastere.htm)

14,000 in 1996, to 300 people in 2009<sup>25</sup>) and an Australian business owned by the same person who started up Gabriel Resources<sup>26</sup>. The resulting project of the venture was the Baia Mare and Baia Borsa exploitations, infamous now for the cyanide spill accident in 2000, when cyanide tailings permeated the Tisa and Danube rivers<sup>27</sup>. Although the investors and the state company did not take on any responsibility for the accident, the International Task Force evaluations show that the break of the dam was caused by poor design and technical calculations in the construction phase, as well as by poor monitoring in the implementation phase of the project.

One of the EU directives with which Romania had to comply after its accession in 2007 concerned the rehabilitation and minimisation of waste and toxic tailings coming from the state activities in the extractive industries<sup>28</sup>. However, there are still areas which are affected by the toxic waste from mining activities, among them being the Roşia Montană village; the historical pollution of soil and surface waters with heavy metals and their compounds has not yet been handled by the local or national authorities and to the present day, acid water is drained into the Roşia stream from the old mine galleries. Research shows that the environmental impact of the pollution in the area is significant and the risks associated with it should make pollution mediation a priority on the public decision-making agenda<sup>29</sup>. The poor commitment of the Romanian state in using EU and national funds for managing the hazardous waste was recently sanctioned in Court by the European Commission, for a failure to comply with EU legislation on mining waste in the case of the Boşneag pond, an abandoned 102 ha tailing pond that holds waste extracted from copper and zinc mines

<sup>25</sup> Compania miniera Remin Baia Mare este in linie dreapta cu procedurile de faliment, Ziarul Financiar, May 3rd, 2009, <http://www.zf.ro/companii/compania-miniera-remin-baia-mare-este-in-linie-dreapta-cu-procedurile-de-faliment-4282533/>

<sup>26</sup> Compania miniera Remin Baia Mare este in linie dreapta cu procedurile de faliment, Ziarul Financiar, May 3rd, 2009, <http://www.zf.ro/companii/compania-miniera-remin-baia-mare-este-in-linie-dreapta-cu-procedurile-de-faliment-4282533/>

<sup>27</sup> Report of the International Task Force for Assessing the Baia Mare Accident, established by the governments of Romania and Hungary, the European Commission and the United Nations, December 2000. [http://viso.jrc.ec.europa.eu/pecomines\\_ext/docs/bmtf\\_report.pdf](http://viso.jrc.ec.europa.eu/pecomines_ext/docs/bmtf_report.pdf)

<sup>28</sup> Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries and amending Directive 2004/35/EC - Statement by the European Parliament, the Council and the Commission, Official Journal of the European Union, <http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32006L0021&from=EN>

<sup>29</sup> Lucrina Ştefănescu, Brînduşa Mihaela Robu and Alexandru Ozunu, Integrated approach of environmental impact and risk assessment of Roşia Montană mining area, Romania. Environmental Science and Pollution Research, Vol. 20, Issue 11, November 2013, pp. 7719-7727.

in Moldova Nouă<sup>30</sup>. EU regulations on mining activities and waste management explicitly mention the need for „an effective system of inspections or equivalent control measures” and of continuous monitoring of the project in all its stages; however, the capacity of authorities responsible for effective monitoring of the implementation of the project is still debatable due to allegations of corruption and mismanagement.

## The local community

In 2007, a sociological study was conducted in the areas which would be impacted by the Roşia Montană project, namely in the towns Abrud and Cămpeni, and villages Bistra, Bucium, Ciuruleasa, Lupşa, Mogoş and Roşia Montană. 62,7% of the interviewed had in their families former miners and held positive expectations from the project<sup>31</sup>. The standard of living in the areas was perceived as rather poor or very poor in 2009, as most of the respondents declared a monthly income of 300 to 900 RON (between 100 and 300 USD at the time), while 16% of the villagers in Roşia Montană had a daily income of less than 2 USD, coming to a large extent from social security benefits. Another study was conducted in the areas in 2011, looking at the degree of confidence the community had in the revival of surface exploitation mining. Almost 2/3 of the respondents had little or very little confidence in the investors, and 1/3 stated they had strong confidence in the company. The highest degree of confidence in the company was manifested among the villagers from Roşia Montană (52,8%), some of them already working for the company. Some respondents drew attention of the fact that while the people who work for the company have a better standard of living than before, the ones who are and will not be employed in the mining project, making a living out of agricultural, wood processing, farm animals or tourism, will be severely affected by the project.

The jobs which would be created if the project is implemented are the main reasons for the high expectations of the locals. Other expectations for the development of the area mention solutions such as the reopening of underground mines or long-term surface mining, creating strategies for increasing the tourism in the area, as well as investing in dairies and other types of farming.

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<sup>30</sup> Environment: Commission takes Romania to Court over toxic tailing pond, European Commission press release, October 16th 2014, Brussels. [http://europa.eu/rapid/press-release\\_IP-14-1149\\_en.htm](http://europa.eu/rapid/press-release_IP-14-1149_en.htm)

<sup>31</sup> Mihai Pascaru, Glocalizare românească. Impactul comunitar al proiectului Roşia Montană Gold Corporation. Limes Publishing House, Cluj-Napoca, 2013.

The inhabitants of the Corna village, which will be the closest to the tailings pond designed within the project, were asked how they feel about the pond being situated in the Corna cut-off. 9,4% of the respondents said they agreed with the initiative with no sad feelings about it, 28,1% declared they agreed with it, but are however sad about it, and 29,7% stated they disagreed with the the initiative. Moreover, 31,3% of the respondents believed that the mining project would have a positive impact on the area, while 48,8% believed the contrary.

Asked about whether they see any other alternatives besides the Roşia Montană Gold Corporation project for the future of the area, 46,9% of the respondents believed there are other alternatives, while 31,9% believed the project was the only option.

In 2013, a series of interviews were conducted with families who have agreed to relocate from Roşia Montană and Corna to the near-by city Alba-Iulia, where the Company built a new neighbourhood from scratch. The questions were aiming to extract the people's input on the perceived advantages and disadvantages brought by their decision to agree with the Company's offer. The main advantages stated by the respondents included better access to public services such as health, education, social assistance, better infrastructure such as a sewage system, running water, street lighting and better chances of employment. The disadvantages they mentioned were the higher living expenses in contrast with the low salaries they get in Alba-Iulia, the perception and fear of being marginalized and home-sickness.

## Public opinion and civil society

The local communities are, as we have seen, divided in their views on the project impact in the area. The villagers and property owners who oppose the project have formed in 2002 an NGO, Alburnus Maior, which acted at the forefront of the campaign „Save Rosia Montana“. Several national and international organizations (primarily environmental and cultural), artists<sup>32</sup> and journalists<sup>33</sup> have adhered to Alburnus Maior’s campaign and disseminated information on the potential risks of the project both locally and nationally. Through investigative journalism, a multi-art activist festival (FânFest, Roşia Montană, 2004-present), public debates and other awareness actions throughout the country, they have formed a critical mass of citizens opposing the project for a wide variety of reasons. Although it was suggested several times, no national referendum was conducted on the matter and the available opinion polls are not credible, as their methodology is questionable and they commissioned by partizan press outlets.

During our visit to Roşia Montană in september 2014, we talked to a representative of the NGO to see if there are any scenarios in which the project would become acceptable, from their point of view; none of the solutions provided by the Company suited the interests of the NGO members. Irreconcilable aspects include expropriations, the relocation of the cemetery, as well as the interference with the cultural heritage, the threat posed to buildings because of explosives use and the cyanide tailings.

On a larger scale, there is no structured input on citizen preferences. In time, they have been exposed to the stakeholders’ discourses, but they lacked the means of participating in the decision-making process. The Chamber of Deputies website features a page dedicated to the project, where few documents issued by the Company, as well as by independent experts and institutions such as the Romanian Academy, the Academy of Economic Studies, and others are made available, along with a forum for discussion. While users express their views on the project, no interaction between them and a representative from the official host of the forum takes place. While the opinions are divided on the project, the most commonly mentioned alternative is tourism. Incidentally, it is on this forum where we have found about the existence of the extensive study conducted by the National Institute of Research and Development in Tourism of the strategies of sustainable development through tourism in

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<sup>32</sup> See one of the leading protest artists, „Interview with Dan Perjovschi“, Art Margins Online, October 25th 2013, <http://www.artmargins.com/index.php/5-interviews/728-interview-with-dan-perjovschi>

<sup>33</sup> See for instance Mihai Goşiu, Afacerea Roşia Montană, Editura Tact, Cluj-Napoca, 2013.



former mining areas. Alburnus Maior has also put forward the alternative of tourism by supporting and promoting a resource and strategy analysis of sustainable development in Roșia Montană.<sup>34</sup>

During the 2013 protests, a wide array of reasons for which people oppose the project have surfaced, due to the Facebook community page Uniți Salvăm<sup>35</sup>, as well as to the slogans and posters from the street: corporate and politician greed, media failure and bias in informing the public, corruption, cyanide infesting waters and soil, sacrificing mountains and landscapes, selling of natural and mineral resources to foreigners, responsibility to future generations, mending legislation to suit corporate purposes, abusive expropriations. However, there is still no study reflecting the public opinion on how the project would impact people's lives.

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<sup>34</sup> Sorana Olaru-Zăinescu. Dezvoltare durabilă alternativă mineritului la Roșia Montană. Analiza resurselor și elemente de strategie. Asociația Alburnus Maior, 2006.

<sup>35</sup> Uniți Salvăm, <https://www.facebook.com/unitisalvam>, aprox. 50,000 members



## A DECISION ANALYSIS MODEL FOR THE ROȘIA MONTANĂ CASE STUDY

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### Decision analysis and DecideIT

Both public authorities and corporations use decision analysis in processes of complex decision-making and policy analysis<sup>36</sup>. Decision analysis models have evolved over time, from the classic decision analysis based on the application of rational choice theories<sup>37</sup> to computational models that allow working with imprecise information<sup>38</sup>. This rather new approach to decision analysis lies at the foundations of the DecideIT software, which allows operating with imprecise and uncertain information in the modelling and analysis of a decision problem and carrying out sensitivity analyses, in order to decide which among different decision alternatives is more suitable when considering factors like: the stakeholders involved, the probabilities, values and weights of different criteria.

The software is a product of long-term research carried out by the Department of Computer and Systems Sciences (DSV), Stockholm University and the Department of Information Technology and Media, Mid Sweden University (ITM). Its evolution is documented by different scholars in both its earlier<sup>39</sup> and more advanced stages<sup>40</sup>. Due to its applicability in complex and large-scale decision environments, the DecideIT tool has been used over the last 15 years in various fields, ranging from investment decision analysis for companies to public decision support for local governments<sup>41</sup>. Scholars have discussed the advantages and limitations of the approaches to evaluating imprecise decision data<sup>42</sup>.

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<sup>36</sup> Sutinen, Danielson, Ekenberg, Larsson, 2010

<sup>37</sup> Clemen, 1996; Keeney & Raiffa, 1976

<sup>38</sup> Danielson, 2005; Fasth & Larsson, 2012; Fasth & Larsson, 2013; Larsson, Johansson, Ekenberg & Danielson, 2005

<sup>39</sup> Danielson, Ekenberg, Johansson, & Larsson, 2003

<sup>40</sup> Danielson, Ekenberg, Idefeldt, & Larsson, 2007; Danielson, Ekenberg, Ekengren, Hökby & Lidén, 2008

<sup>41</sup> Sutinen et al. 2010

<sup>42</sup> Ekenberg 2000; Ekenberg and Thorbiörnson 2001; Ekenberg et al. 2005; and Danielson and Ekenberg 2007

### Prior studies with DecidIT

In 2012, Danielson and Ekenberg carried out a case study regarding the Tisza River in Hungary. Using a probabilistic multi-stakeholder approach they assessed four different scenarios for designing a public-private flood insurance system in Hungary. They opted for a decision model that would include the main stakeholders due to the rather conflicting views that they held: on the one hand, most Hungarians expected the government to protect them and cover their losses in case of floods, while on the other, public authorities considered that this policy was no longer affordable, and wanted to transfer the responsibility to the private sector<sup>43</sup>.

In their analysis, the scholars used background data provided by the Hungarian Academy of Sciences and also conducted interviews with the stakeholder and worked on a simulation model testing the effects of different policy options. Using DecidIT, they generated a decision tree including estimates of the values and probabilities of each alternative:

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<sup>43</sup> Danielson & Ekenberg, 2012

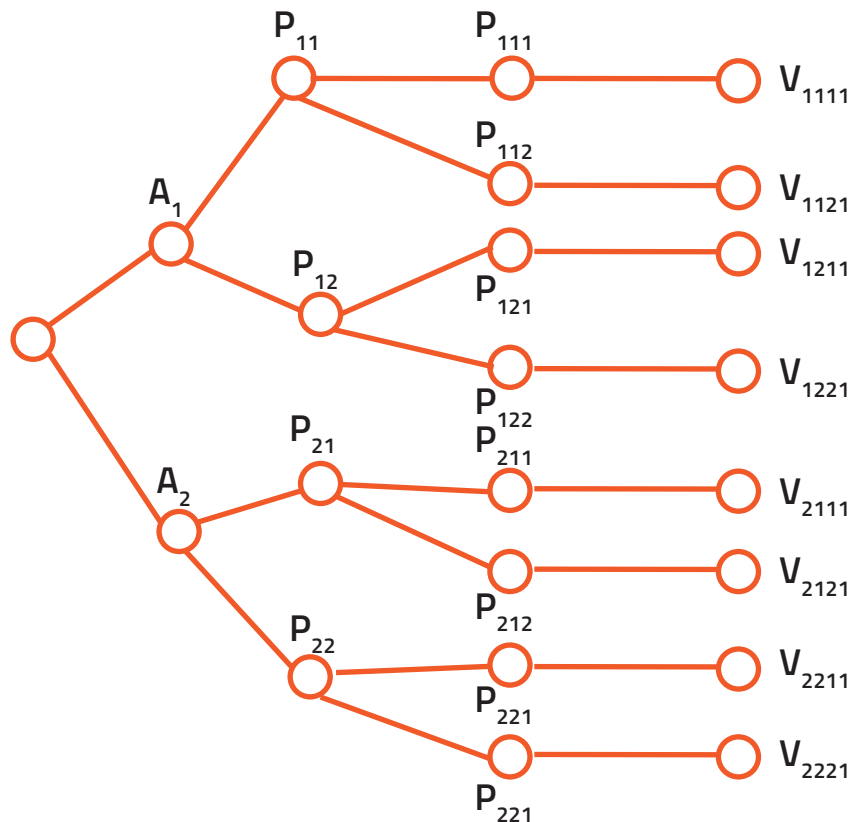


FIGURE 3. A decision tree for decisions under risk (Danielson & Ekenberg, 2012)

A similar decision analysis<sup>44</sup> was conducted in the island of Älgö, a submunicipality in Sweden marked by long-term disagreements between the citizens and the municipality government over the decision alternatives on the following subjects:

- A new water and sewer system
- A new road plan
- A new commuting marina.

Because of the controversy, the decisions had been postponed for several years, and the municipality of Nacka decided to finally make a decision. In order to achieve maximum transparency, to involve the different stakeholders and their opposing views, they chose to back their decision on background research and analysis. The scholars used decision trees and multi-criteria hierarchy trees in DecidelT to evaluate the five alternatives. The values

<sup>44</sup> Danielson et al. 2007, 2008

and weights of the criteria were assigned based on the input from politicians, experts and stakeholders. The researchers were able to draw risk profiles for the alternatives, and could eliminate the options with consequences deemed too severe, as well as to differentiate between alternatives that would otherwise have seemed equally preferable, thus facilitating the resolution of a years-long dispute.

Another similar case study for using decision analysis regards a city traffic planning decision problem in Stockholm<sup>45</sup>. Unlike in the previous examples, in this case there was not yet controversy, and the decision analysis was carried out in the initial phase of planning decision making. The City of Stockholm adopted in 2010 a new City Plan based on a strategic political vision for the growth of the city over the next 20 years to 2030, which was expected to have a big impact on transport within the city. In order to tackle this challenge, the City Traffic Administration has started working on a Traffic Planning Strategy, and decided to determine if using a decision analysis model would help in the process. The researchers tested different alternatives by defining a set of multiple criteria, which were weighed and assigned values in terms of intervals and relations, due to the imprecise nature of the data. The criteria, as well as the decision alternatives and the assessment impact were defined during a series of workshops. Based on these data, the researchers were able to conduct a sensitivity analysis and to filter out one of the alternatives.

### The methodology of the Roșia Montană case study

#### Background research, establishing the criteria and subcriteria

The first step of the analysis consisted in background research. Over 100 documents from the past 15 years have been gathered regarding the Roșia Montană mining project, which cover the main official, formal and less formal documents covering the case and produced by a wide range of stakeholders.

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<sup>45</sup> Larsson, Firth, & Ekenberg, 2011

These documents vary in terms of type:

Official reports
Legislative acts (draft or approved bills, government decrees, emergency ordinances, contracts etc.)
Studies (Research studies, technical studies, financial studies)
Books, Scientific/Academic/Research articles
Press articles
Official websites of RMGC or of public institutions
Declarations, petitions, contestations, discourses

and of source:

ISSUERS	
Government and public institutions	The Romanian government
	National public institutions
	Local public institutions
	The Roșia Montană Special Committee
European Union	European institutions (the European Commission, the European Parliament etc.)
The project promoter	Roșia Montană Gold Corporation (RMGC)
Experts	Independent experts (national and international) Research institutions, academies, universities
Civil society	Local community
	Alburnus Maior
	Uniti Salvam community
	Journalists
	Other non-governmental organizations, associations, foundations
	Citizens

The corpus was selected so as to cover all the important stakeholders and their points of view regarding the project, in a balanced way. In the selection of the documents an important criterion was their credibility; the researchers tried to identify with priority those documents that expressed the official position of the different stakeholders involved, as well as

documents that are supported by data/factual information/research. For this reason most of the corpus consists in studies and reports.

In order to facilitate the handling of this large corpus of texts, the NVivo software for qualitative content analysis was used. The documentation process resembled that of a traditional content analysis, in that it was guided by a scheme of categories (see Figure 4 and Annex 1), which was created through an inductive approach – based on the documentation at hand. An initial multi-criteria tree was designed based on the arguments identified in a previous analysis<sup>46</sup>, which was later on elaborated upon during the thorough background research phase. The main branches of the multi-criteria tree are: Economy, Environment, Social and Cultural, too which we later added the dimension of Credibility, considering that the issues regarding the transparency, legality and credibility of the entire development of the Roșia Montană project have played a significant role in the unfolding of the events, especially during the last years (for more details, refer to the section in this report about the Short history of the decision-making process). Each of these branches were split in multiple categories and subcategories representing the arguments brought up by the different stakeholders regarding the possible consequences, both positive and negative, of the exploitation project (Figure 4).

With the help of NVivo, the researchers went through all the documents previously collected and coded relevant fragments of text under each criteria in the scheme of categories, separating negative from positive evaluations, as well as the different issuers of the respective positions/arguments. This process helped us map the stakeholders' attitudes towards the project, as well as to check which criteria and arguments are more commonly discussed by the different parties involved, which are the ones where there is some consensus versus topics where the views are highly divergent, who holds the negative and the positive opinions etc. This information was later used in the process of assigning values and weights to the multi-criteria tree. However, due to the fact that we tried to ensure the balance and plurality of stakeholders and perspectives, we identified both negative and positive evaluations for every criterion, which made it hard to decide in absolute terms which perspective is more accurate.

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<sup>46</sup> <http://www.openpolitics.ro/rosia-montana/argumente-pro-si-contra-rosia-montana.html>

## Defining the alternatives of development for Roșia Montană

During the background research phase we were also able to identify the decision alternatives for the analysis. We chose to resume to the most commonly discussed four alternatives, for which we have managed to gather reliable data:

**Alternative 1 (Alt.1).** The updated project with the provisions from the 2013 Agreement<sup>47</sup> between RMGC and the Romanian Government (which was also debated by the Special Commission), for which we had most of the documentation.

**Alternative 2 (Alt.2).** The Zero alternative, which implies that the mining project would be dropped, but nothing else would be done instead. It is a non-action alternative and it was assessed from a series of documents, among which: the Environmental Impact Assessment for Roșia Montană Project (EIA) documentation<sup>48</sup> submitted by the company, the report from the Hungarian Ministry of Environment and Waters<sup>49</sup>, following the Convention on Environmental Impact Assessment in a Transboundary Context, a study from the Romanian Academy<sup>50</sup>, the Special Commission's Report<sup>51</sup> and other expert studies.

**Alternative 3 (Alt.3).** The project in its initial form, with the provisions from the 1999 Exploitation License<sup>52</sup>.

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<sup>47</sup> Guvernul Romaniei - Gabriel Resources Ltd. - Roșia Montană Gold Corporation S.A, Acord privind unele măsuri aferente exploatării minereurilor auro-argentifere din perimetrul Roșia Montană, [http://legea.rosiamontana.org/wp-content/uploads/2013/08/2-Acord-vDPIIS\\_29-07-2013\\_actualizat-30-07-2013-TC.pdf](http://legea.rosiamontana.org/wp-content/uploads/2013/08/2-Acord-vDPIIS_29-07-2013_actualizat-30-07-2013-TC.pdf)

<sup>48</sup> RMGC, Environmental Impact Assessment for Roșia Montană Project, <http://en.rmgc.ro/rosia-montana-project/environment/environmental-impact-assessment.html>

<sup>49</sup> Comentarii pe marginea Studiului de Impact asupra Mediului pentru Proiectul Rosia Montana facute in baza Conventiei Espoo de catre Ministerul Mediului si Apelor din Ungaria cu sprijinul unor agentii guvernamentale si a unor organizatii non-guvernamentale, [http://www.cdep.ro/img/rosiam/pdfs/comments\\_hung.pdf](http://www.cdep.ro/img/rosiam/pdfs/comments_hung.pdf)

<sup>50</sup> Academia Română, 2013, ANALIZA ACADEMIEI ROMÂNE PRIVIND PROIECTUL DE EXPLOATARE MINIERĂ DE LA ROȘIA MONTANĂ - RISCURI PRIVIND MEDIUL ȘI DEZVOLTAREA DURABILĂ A ZONEI, <http://www.acad.ro/forumuri/doc2013/d0619-ProiectulRosiaMontana-AnalizaAR.pdf>

<sup>51</sup> Comisia Specială Comună a Camerei Deputaților și Senatului pentru avizarea Proiectului de lege privind unele măsuri aferente exploatării minereurilor auro-argentifere din perimetrul Roșia Montană și stimularea și facilitarea dezvoltării activităților miniere în România, 2013, Raport asupra Proiectului de lege privind unele măsuri aferente exploatării minereurilor auro-argentifere din perimetrul Roșia Montană și stimularea și facilitarea dezvoltării activităților miniere în România, <http://www.senat.ro/Legis/PDF/2013/13L475CR.pdf>

<sup>52</sup> AGENTIA NATIONALA PENTRU RESURSE MINERALE, Campania Nationala a Cuprului, Aurului si Fierului "MINVEST" S.A, SC EUROGOLD RESOURCES S.A, LICENTA DE CONCESIUNE PENTRU EXPLOATARE NR. 47/1999, <http://s3.documentcloud.org/documents/782220/licenta-rosia-montana.pdf>

**Alternative 4 (Alt.4).** The alternative of touristic development in the Roșia Montană area. On the Chamber of Deputies webpage, a forum for debate on the Roșia Montană issues has a thread destined for discussing alternatives other than the RMGC project. The most popular solution seen by the users was doing tourism in the area. However, nowhere on the ministries' websites or on the Chamber of Deputies list of available documents on the Roșia Montană case could we find a study on the touristic potential of development of the area. We found that such a study does exist, it was conducted by the National Institute of Research and Development in Tourism during 2004-2006, financed through the PHARE program and the Ministry of Education and Research. The institute is responsible with elaborating strategies and impact studies for touristic development throughout Romania, many of their results leading to regional development strategies and financed by the Ministry of Tourism. Their model of development of the areas in Apuseni Mountains affected by mining closures consists of five volumes which, according to the principal investigator, Georgeta Maiorescu, with whom we discussed, were sent to the ministries in 2006 and remained without an answer. She also submitted their results to the Ministry of Environment as a viable alternative to the RMGC project in the public consultation on the EIA reports, and received an answer from the company, instead of the Ministry. This alternative seems to be the most popular among the civil society sector, including among research institutions such as The Academy for Economic Studies or the Romanian Academy. Citizens, local NGOs and the Save Roșia Montană campaign have been promoting this alternative through an annual activist festival in Roșia Montană, lobbying for the inclusion of the cultural heritage on the UNESCO list of protected heritage sites.



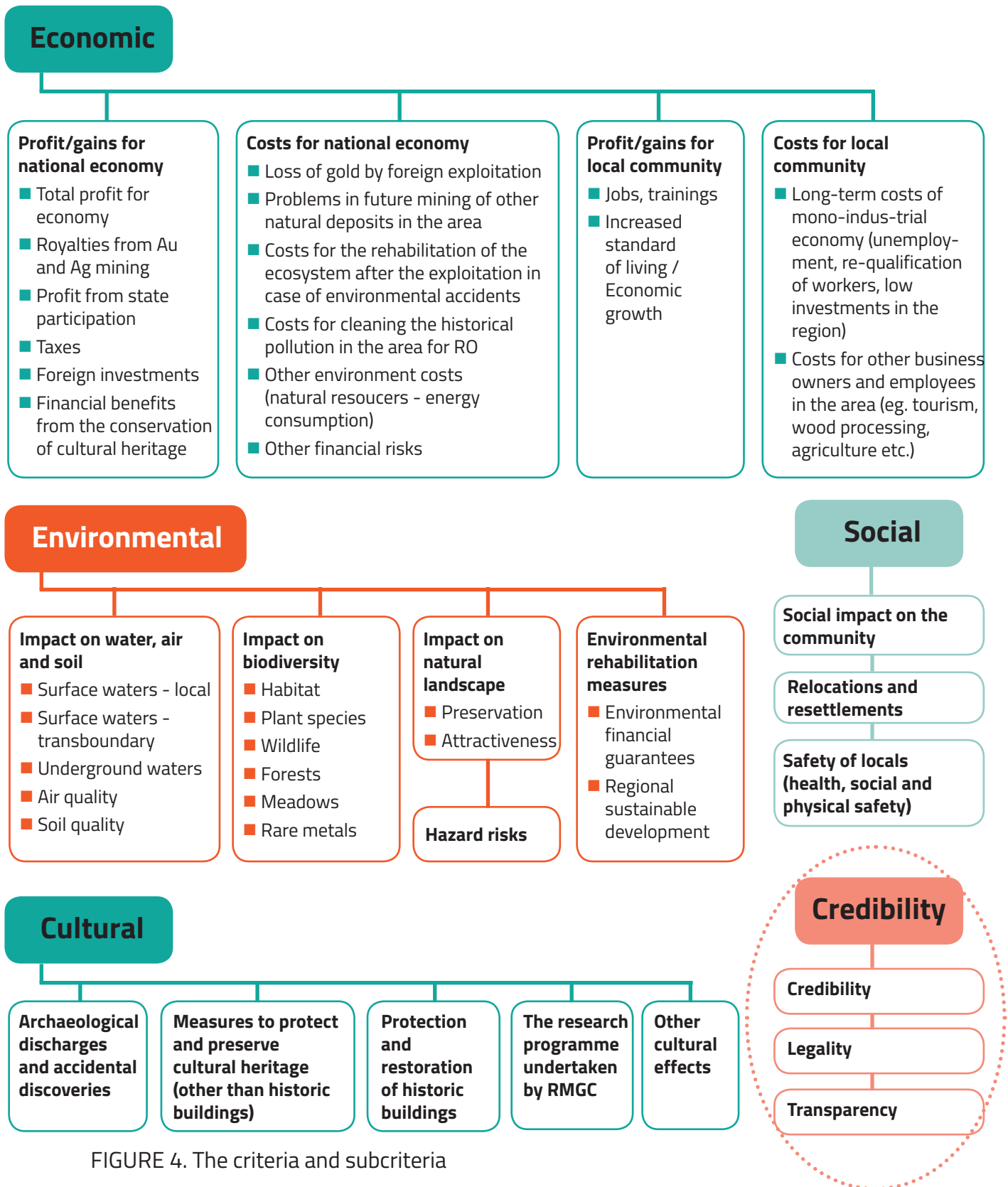


FIGURE 4. The criteria and subcriteria

### Assigning values and weights to the multi-criteria tree

The decision analysis was carried out using the DecidelT software. In order to evaluate the four alternatives, the multi-criteria tree was computed and values and weights were assigned. Since the background research revealed that the documentation involves mainly projections and scenarios based on rather imprecise or uncertain information which is often conflicting depending on the source, we used an interval-based method to estimate the values of the criteria, complemented by qualitative estimates (relations between the criteria). This approach is typical for multi-stakeholder analyses<sup>53</sup> that deal with imprecise data, as previous case studies have shown<sup>54</sup>.

Due to the nature of the information, we designed a multi-criteria tree instead of a decision tree. In order to reduce uncertainty and subjectivity as much as possible, we used a [-1, 1] interval, with the following logic:

Values

**[-1,0]** = most probably negative consequences (or best case none), but the intensity is unknown (eg: if there will be environmental accidents, they will imply rehabilitation costs, which means that the best scenario is the 0 scenario)

**[0,1]** = most probably positive consequences (or no consequences), but the intensity is unknown (ex. Profit from royalties is in itself a positive outcome, worst case scenario being 0 profit)

**0** = no consequence (the profit generated by the project becomes 0 in Alt.2)

**-1** = most probably negative (eg. environmental costs such as the high amount of energy and other natural resources consumed for the project are a certain negative impact)

**1** = most probably positive (we actually didn't find cases where to assign this value, taking into consideration that it would also imply a relative consensus among experts)

**[-1,1]** = where experts are almost equally divided and it is hard to say whether the consequence will be good or bad, or where we do not have enough reliable data for such predictions (eg. concerning the conservation of cultural heritage, or in regard to the social impact of Alt.2).

These values were assigned separately for each criterion under each of the four alternatives. To a large extent, we tried not to make assumptions in our evaluations that were not directly

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<sup>53</sup> see Danielson & Ekenberg, 2012

<sup>54</sup> Danielson et al. 2007, 2008; Larsson, Firth, & Ekenberg, 2011

supported by data, and we avoided assigning precise values, working with intervals, weights and relations between criteria. In addition, we assigned different weights to the criteria and defined equivalence relations between the four alternatives for each criterion (better than, equal and approximately equal to, worse than).

The decision information can be considered as constraints in the space formed by all decision variables which are collected as linear constraints to the solution sets of the spaces spanned by the weight and value variables, respectively. These constraints may be both range constraints, i.e. constraints involving only one variable such as interval boundaries, and comparative constraints involving two variables. To further aid in the modelling of the problem, the orthogonal hull concept is introduced, indicating to the decision-maker which parts of the statements that are consistent with the information given so far. This becomes then the projection of the constrained spaces onto each variable axis, and can thus be seen as the meaningful interval boundaries for the decision situation. The same type of input is used for the components involved, i.e., alternative values  $v$ , and weights  $w_j$ , although the normalization constraints  $\sum w_j = 1$  must not be violated in the weight case.

All input into the Roșia Montană model was subject to consistency checks performed by the DecidIT tool. The calculations are based on the weighted sum of the alternative values under the criteria and sub-criteria aggregated for the entire decision problem. For instance in a three level tree as the current one, this becomes,  $V(A_s) = \sum w_i \sum w_{ij} \sum w_{ijk} v_{ijk}(A_s)$ , where  $v_{ijk}(A_s)$  is the value of alternative  $A_s$  under sub criteria  $ijk$ . Given this, we then calculate the strength of alternatives as a mean for further discriminating the alternatives. The strength simply denotes the difference in weighted value, i.e. the expression  $V(A_i) - V(A_j)$  for the difference between alternatives  $A_i$  și  $A_j$ . In this way we can readily calculate the maximum and minimum difference between the alternatives.

The process of assigning values, weights and relations is based on the previous systematic documentation, where we tried to cover most of the documentation available from a broad range of sources covering the topic. As already mentioned, we prioritized official documents and expert studies, due to their higher reliability. The selection of the documentation was made on the principle of balanced representation, our goal being to cover the arguments of all stakeholders involved in a fair manner. The database is available in Excel format on request.

In order to ensure the reliability of the assigning values process, a reliability test was applied. The two researchers assigned the values and relations independently and afterwards confronted the evaluations, discussing the differences and reaching consensus regarding the optimal way to proceed. Furthermore, in the sensitivity analysis presented in the next section

of the report we devised different scenarios changing the weights of the criteria in order to see to what extent the relation between the alternatives alters.

An important feature of this process is the sensitivity analysis. This analysis attempted to highlight what information was the most critical for the obtained results and must therefore be subject to careful additional consideration. It also points which of the assessments are too imprecise to be of any assistance in the discrimination of alternatives and thus should be made more accurate, thereby triggering and facilitating iteration in the process. The embedded sensitivity analysis, called the concept of contraction, is performed by reducing the widths of the intervals (contraction) for the values and weights in the analysis model of the decision problem. The concept's idea is to shrink the orthogonal hull while studying the stability of the maximum strength at different contraction levels. The level of contraction is indicated as a percentage, so that for a 100% level of contraction all orthogonal hull intervals have been reduced to their respective focal points. The contraction can be seen as cutting the hull from the extreme points (having a lower reliability or a lower degree of belief towards the focal point, increasing the lowest permitted degree of belief. When dealing with interval statements only this is quite simple, and more complicated when comparative constraints are involved.

## EVALUATION AND ANALYSIS OF ALTERNATIVES

As we have previously mentioned, the five main criteria of our multi-criteria decision tree are: **economic, environment, social, cultural and credibility.**

The four alternatives computed in the decision model are:

**Alt. 1 =** The updated project with the provisions from the 2013 Agreement between RMGC and the Romanian Government (which was also debated by the Special Commission)

**Alt. 2 =** The Zero alternative (the project is dropped and nothing else is done instead)

**Alt. 3 =** The mining project in its initial form, with the provisions from the 1999 Exploitation License.

**Alt. 4 =** The mining project is dropped and instead a long-term touristic development project in the Roşia Montană area is implemented.

Below we go through various scenarios and their consequences for the Roşia Montană exploitation project. The following scenarios were devised according to 9 different prioritizations, which led to separate weighing choices of the main criteria: (1) indiscriminative assessment of issues importance; (2) coverage of issue in the consulted data; (3) potential of improving the credibility; (4) stakeholder interest – the Romanian state; (5) stakeholder interest – civil society and local opponents; (6) local, national and transboundary interests; (7) stakeholder interest – local community; (8) transparency and citizen interest; (9) 2013 draft mining bill stipulations.

### Scenario 1: indiscriminative assessment of issues importance

If we give all emitters' views and interests equal importance and refrain from weighing discriminately on account of the expert knowledge available on each category, visibility in the public sphere, local versus national agendas, or types of capital at stake, we consider that all main criteria, economic, environmental, social, cultural and credibility have equal weights. Our evaluation thus relies on the constrains used for each sub-criteria and the qualitative relations thereof. Consequently, by using these settings, the expected value of the four alternatives is visible in the figures below. The expected value graph is a representation of an aggregation of the weighed sum for all criteria. The upper and lower graph lines are the minimum and maximum expected values along the horizontal axis, from 0 to 100% contraction levels.

The expected value graphs become as follows:

**85% contraction level**

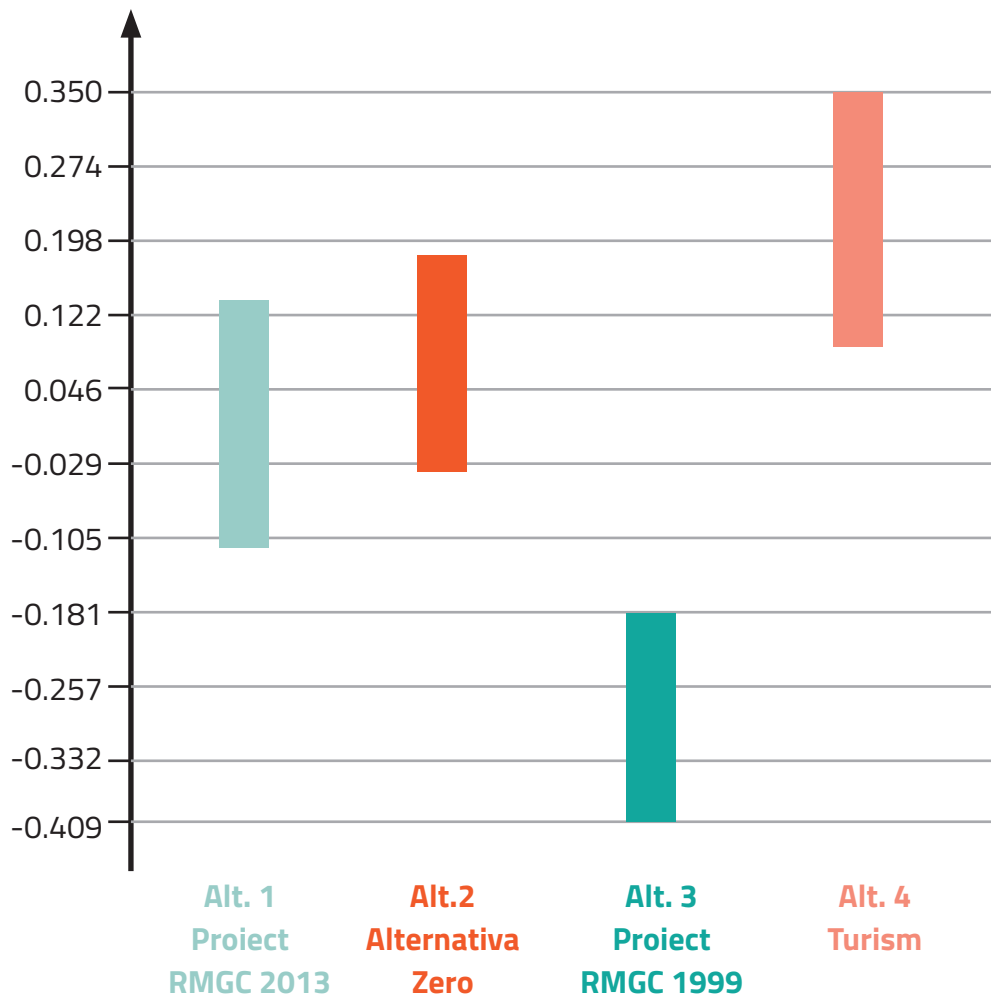


FIGURE 5. Scenario 1. Evaluation of the 4 alternatives

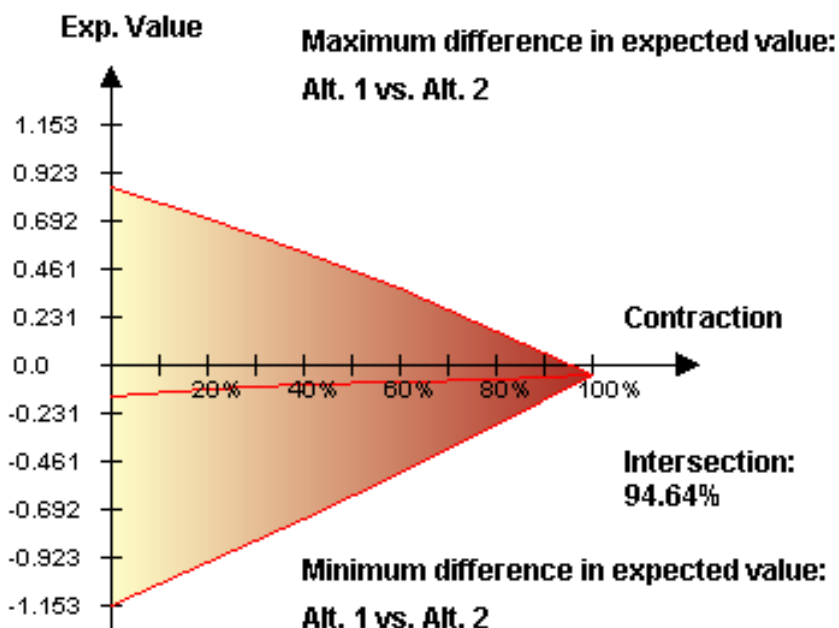


FIGURE 6. Scenario 1. Comparison Alt.1 and Alt.2

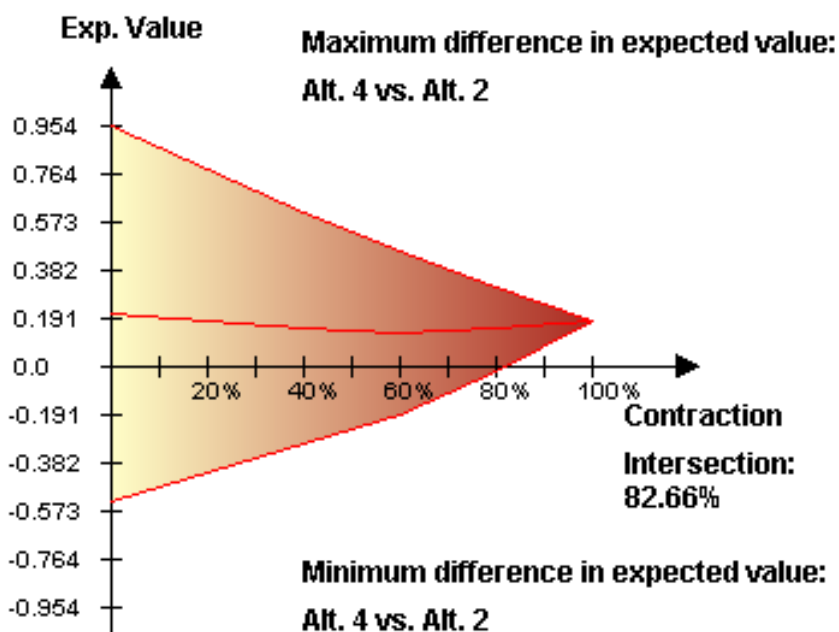


FIGURE 7. Scenario 1. Comparison Alt. 4 and Alt. 2

Even though we have worked with imprecise data, the decision analysis model is rather robust, enabling us to evaluate the four alternatives. Based on Fig. 5, we can draw three conclusions with a reasonable amount of confidence:

- **Alternative 3** (The project in the initial form, with the provisions from the 1999 license) is the least advantageous of the four, and can be discarded (at a contraction level of 85% there is no overlap with the others, and the values are negative and lowest).
- **Alternative 4** (Tourism) appears to be the optimal decision in this scenario.
- **Alternative 1** (The mining project in its updated form) and **Alternative 2** (No mining project, nothing instead to be done in the area) overlap considerably, which means that in this scenario there is not enough data to strictly differentiate between them, the consequences of each option being rather comparable. However, Alt. 2 becomes very slightly preferable to Alt. 1, the RMGC project. Fig. 6 confirms that the difference between Alt. 1 and Alt. 2 is insignificant and that more detailed data is needed in order to better comparatively assess the two options. Fig. 7 compares Alt. 4 with Alt. 2 (and implicitly with Alt. 1, due to the overlap between the two) and confirms the conclusion from Fig. 5, namely that Alt. 4, a touristic development project, would be the optimal solution.

### Scenario 2: coverage of issue in the consulted data

The second scenario we propose stems from the range of interests dedicated to the categories outlined above throughout the consulted documents and statements. The background research revealed that the most widely discussed issues regarding the project were the economic and environmental aspects, covered by governmental statements, license agreements, expert reports, national and international institutes' positions and others, while social and cultural issues seemed somewhat secondary in the public debate, gaining visibility mainly through civil society efforts. For this reason, we considered the second scenario to be one where the economic and environmental consequences weigh the same, then social and cultural issues also bear equal weights, but the former categories weigh more than the latter (without specifying how much more, because that is uncertain). The credibility dimension was assigned a lower weight than all other four criteria, considering that it has a rather indirect effect on the overall evaluation of the project.



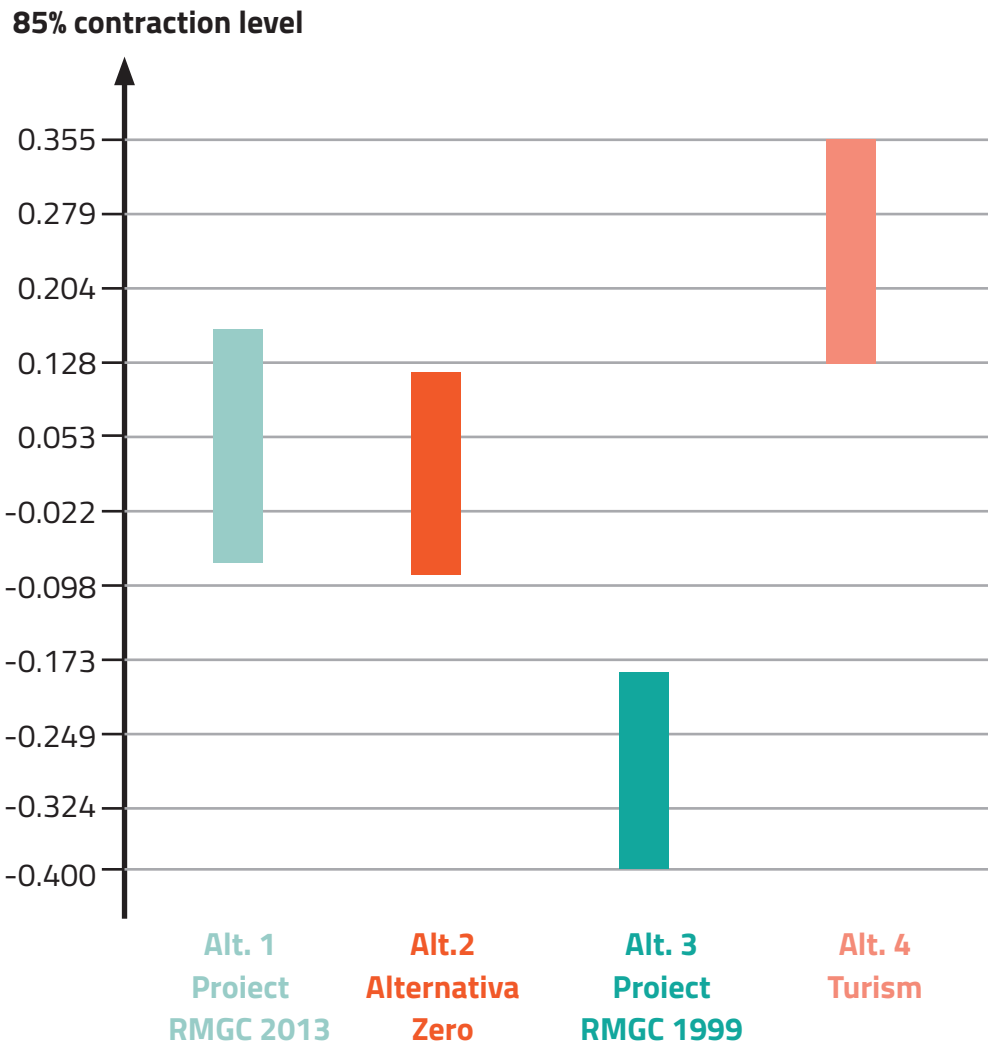


FIGURE 8. Scenario 2.Evaluation of the 4 alternatives

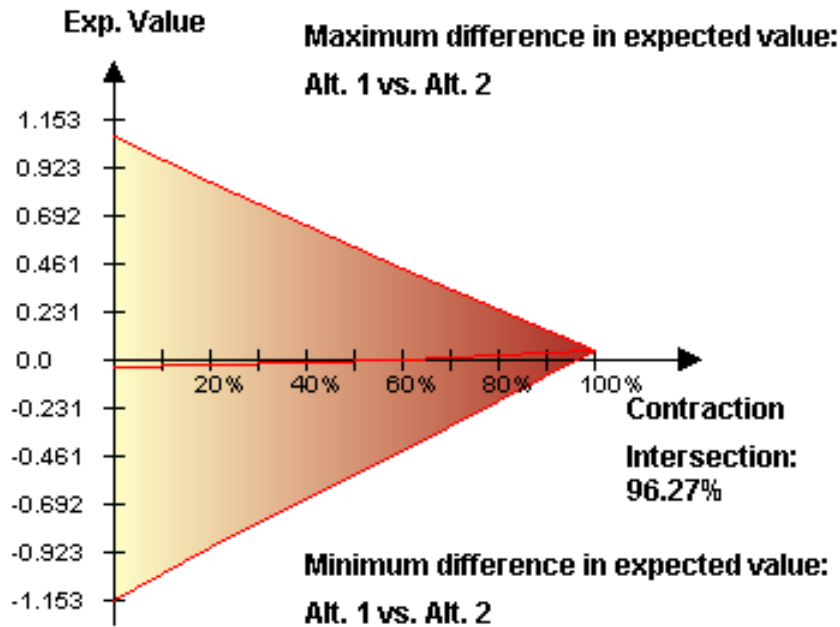


FIGURE 9. Scenario 2. Alt1 vs. Alt2

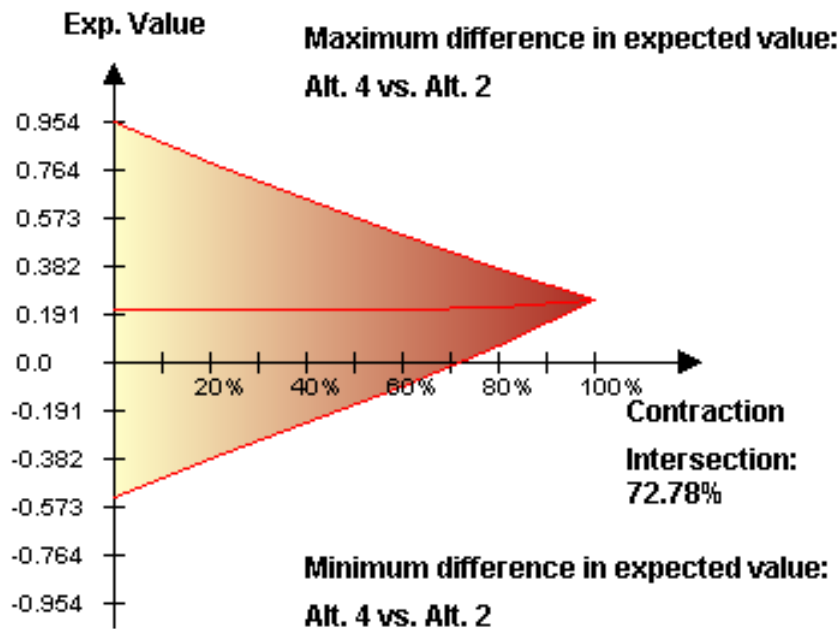


FIGURE 10. Scenario 2. Alt4 vs. Alt2

As we can see in Fig.8, Alt.3 and Alt.4 are clearly differentiated in this scenario as well, a touristic development in the Rosia Montana area being the optimal choice, and the RMGC project before the recent renegotiation - the poorest choice. Unlike the first scenario, Alt.1 becomes slightly more preferable to the Zero Alternative, but their overlapping is still too high to assess their differentiation (for this, see Fig.9).

### Scenario 3: potential of improving the credibility

For the third scenario, we checked the extent to which the credibility issues affect the evaluation of Alt. 1, the renegotiated RMGC project, in relation to the other alternatives. If the Company and the Romanian Government would improve the transparency of their negotiations, steps and aims regarding the project and would initiate a permanent dialogue on the topic with citizens and the civil society in the decision-making process, credibility could be solved and make room for an open democratic discussion on the remaining four criteria. The expected value graphs for scenario 2 where we assigned a weight at most likely point 0 can be seen below:

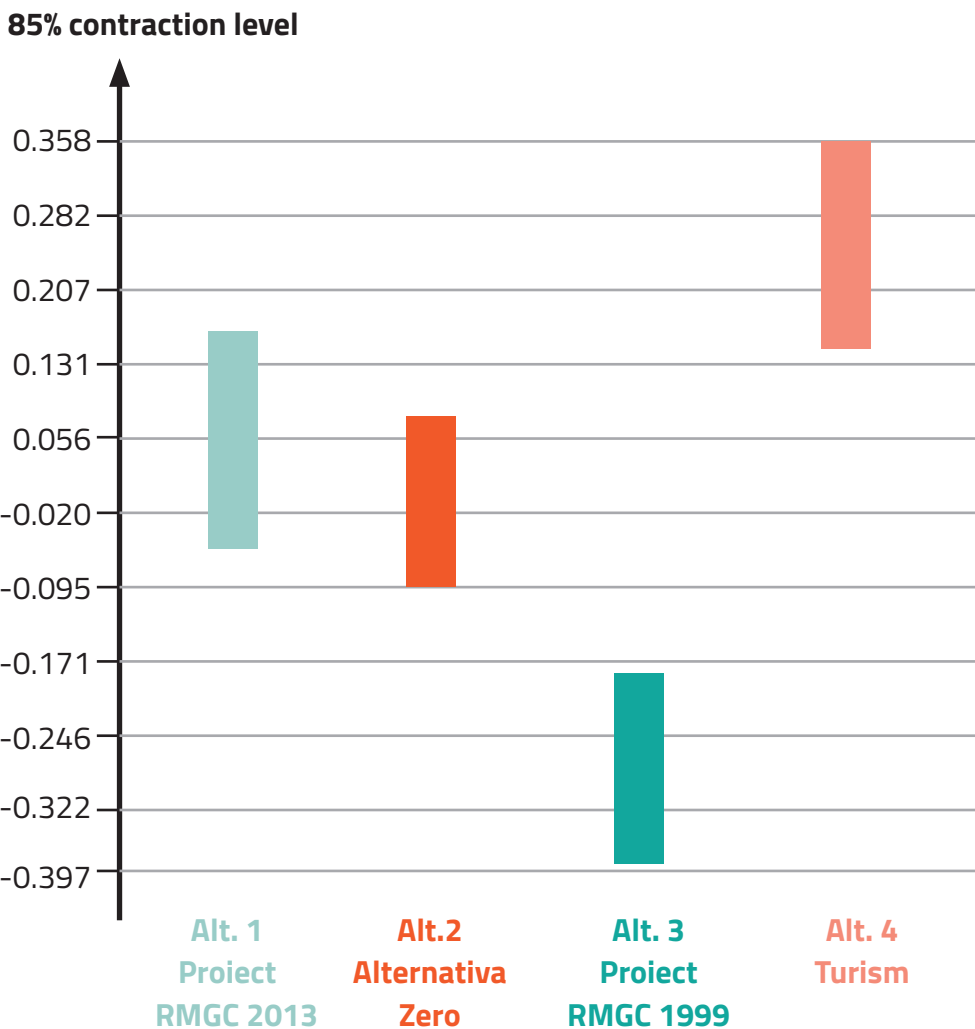


FIGURE 11. Scenario 3. Evaluation of the 4 alternatives

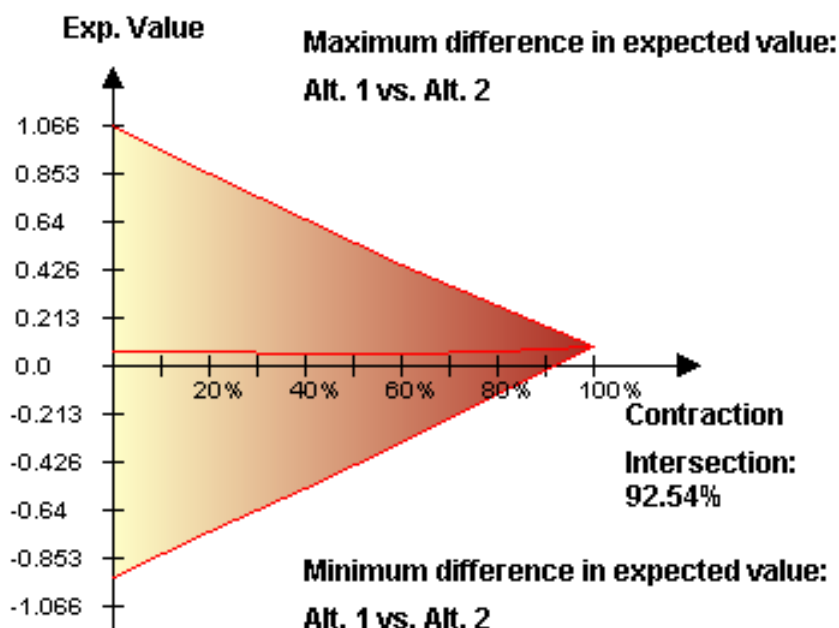


FIGURE 12. Scenario 3. Alt1 vs. Alt2

According to Fig.11 and 12, if we discard the credibility dimension and consider only economic, environment, social and cultural issues, the results remain mostly the same: Alternative 3 can be dropped, Alternative 4 is still the best, and Alternatives 1 and 2 overlap, though the former becomes very slightly better than the Zero Alternative.

### Scenario 4: stakeholder interest – the Romanian state

Romanian officials have repeatedly stressed the economic potential of the Roşia Montană Gold Corporation investment, mainly highlighting the profits derived from royalties and state participation, as well as the potential for creating jobs in the area. The desire to exploit natural resources for the beneficial impact upon the national economy has been expressed by various governments and the former president, being the impetus of maintaining the Company project on the public and political agenda. Below we can look at the value graphs when giving the highest weight to the economic aspects, all other criteria having equal weights among themselves, lower than the economic one.

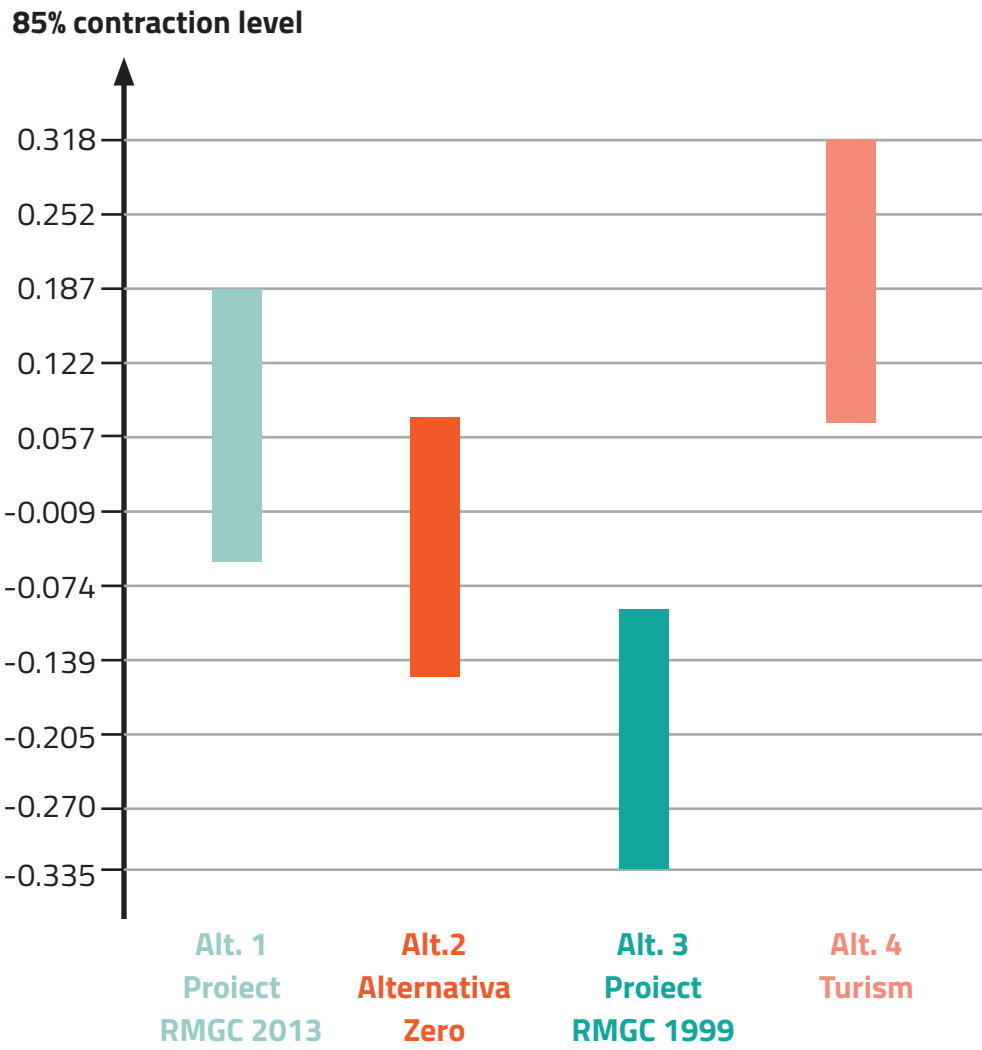


FIGURE 13. Scenario 4. Evaluation of the 4 alternatives

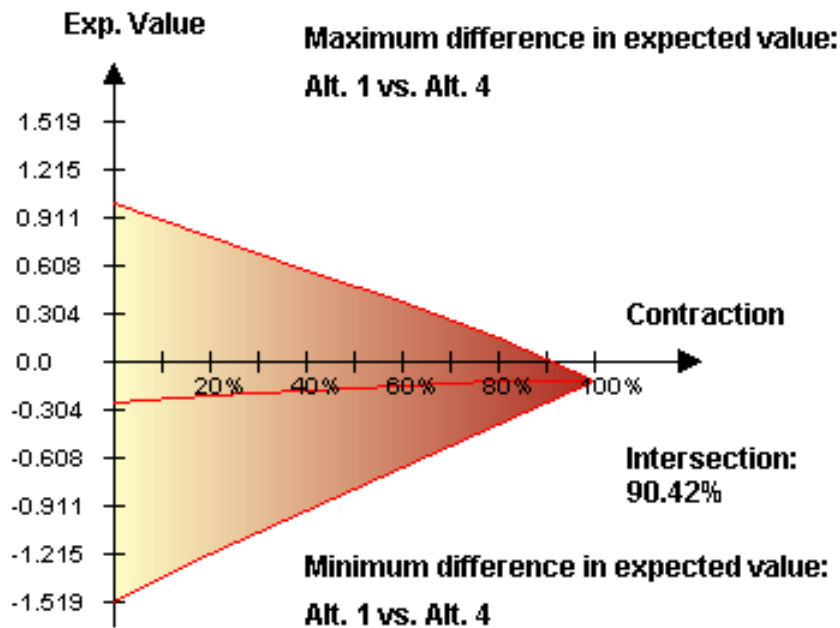


FIGURE 14. Scenario 4. Comparison Alt.1 and Alt.4

If the economic arguments prevail over all the others, then the results of the decision analysis become somewhat different (Fig. 13, 14). Alternative 1 (the updated mining project) becomes almost as preferable as Alternative 4 (doing tourism), with an overlap of almost 95%, but also overlaps to great extent with the Zero Alternative, which makes it somewhat difficult to distinguish between the three alternatives.

**Scenario 5: stakeholder interest – civil society and local opponents**

In this set-up, we prioritize the social, cultural, environmental and credibility aspects over the economical benefits, as demanded by several opposing NGOs including Alburnus Maior and the majority of the protesters. According to critics of the RMGC project, the economical gains derived from the gold and silver exploitation are neither substantial, nor stable enough for a long-term national economy development and better standards of living (the “Dutch disease” of natural resources maintaining instable economies). Moreover, regardless of the economic potential, some opponents consider the social, cultural and environmental risks and impact much more important to consider in the maintainance or future urban planning of the area, being at the same time active watchdogs of the legal process of obtaining local authority and ministry permits.

**85% contraction level**

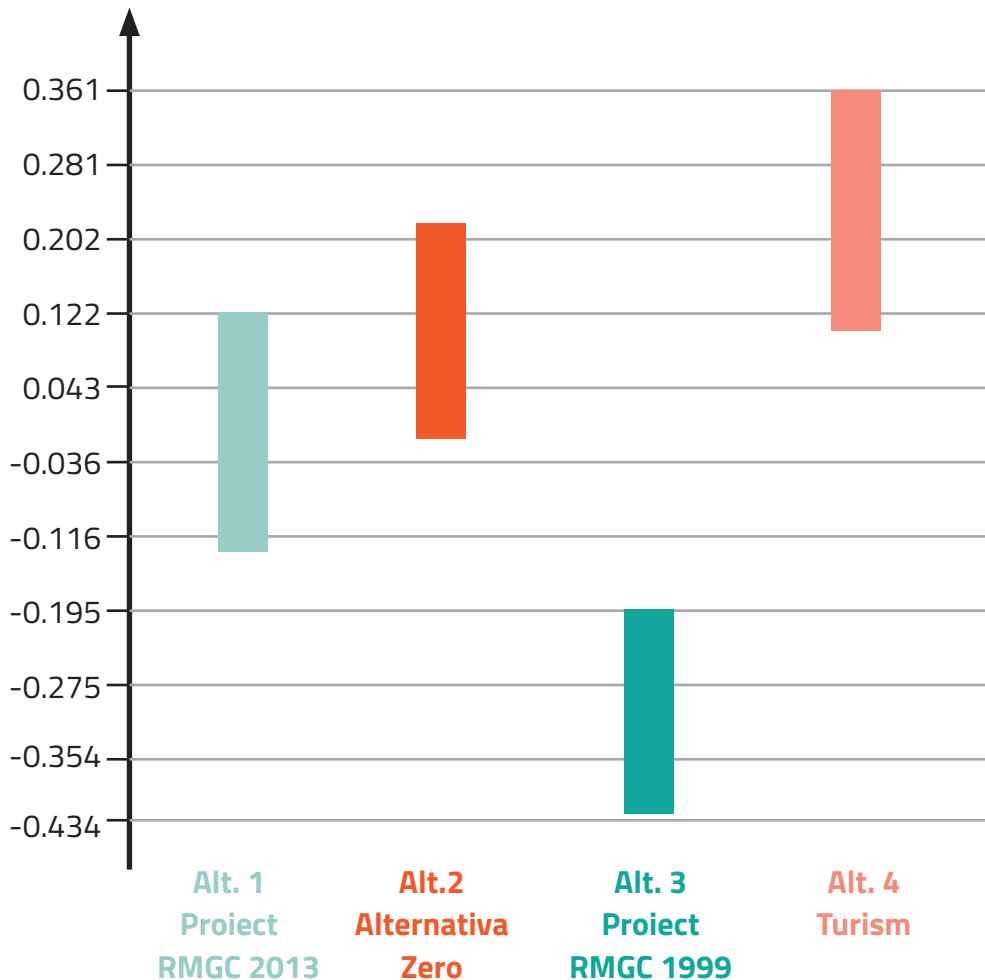


FIGURE 15. Scenario 5. Evaluation of the 4 alternatives

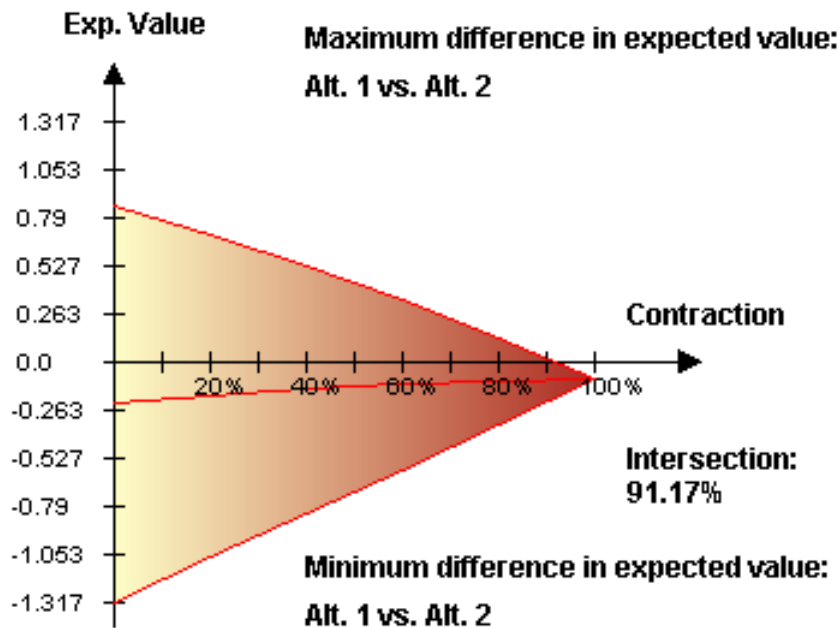


FIGURE 16. Scenario 5. Comparison Alt.1 and Alt.2

Again, there is a shift between Alt. 1 and Alt. 2, the latter (the one favored by the stakeholders who oppose and protest against the project) becoming a better option than the RMGC project for the area.

### Scenario 6: local, national and transboundary interests

The highest risk concerns found throughout the available documentation, expressed by experts, citizens and public officials alike, deal with environmental aspects. Most countries including Romania require Environmental Impact Assessments for mining projects, RMGC also submitting one in order to get a secure pass from the Ministry of Environment, which has not been granted yet. However, the Romanian side is not the only one having a say in the matter, the Hungarian government expressing its call for caution both in diplomatic meetings and expert reports. At the same time, one of the EU directives with which Romania had to comply after its accession in 2007 concerned the rehabilitation and minimisation of waste and toxic tailings coming from the state activities in the extractive industries. However, there are still areas which are affected by the toxic waste from mining activities, among them being the Roşia Montană village. Research shows that the environmental impact of the pollution in the area is significant and the risks associated with it should make pollution mediation a



priority on the public decision-making agenda. This scenario weighs the environmental issues higher than all other criteria, which have smaller equal weights, the resulting evaluation graphs being available below:

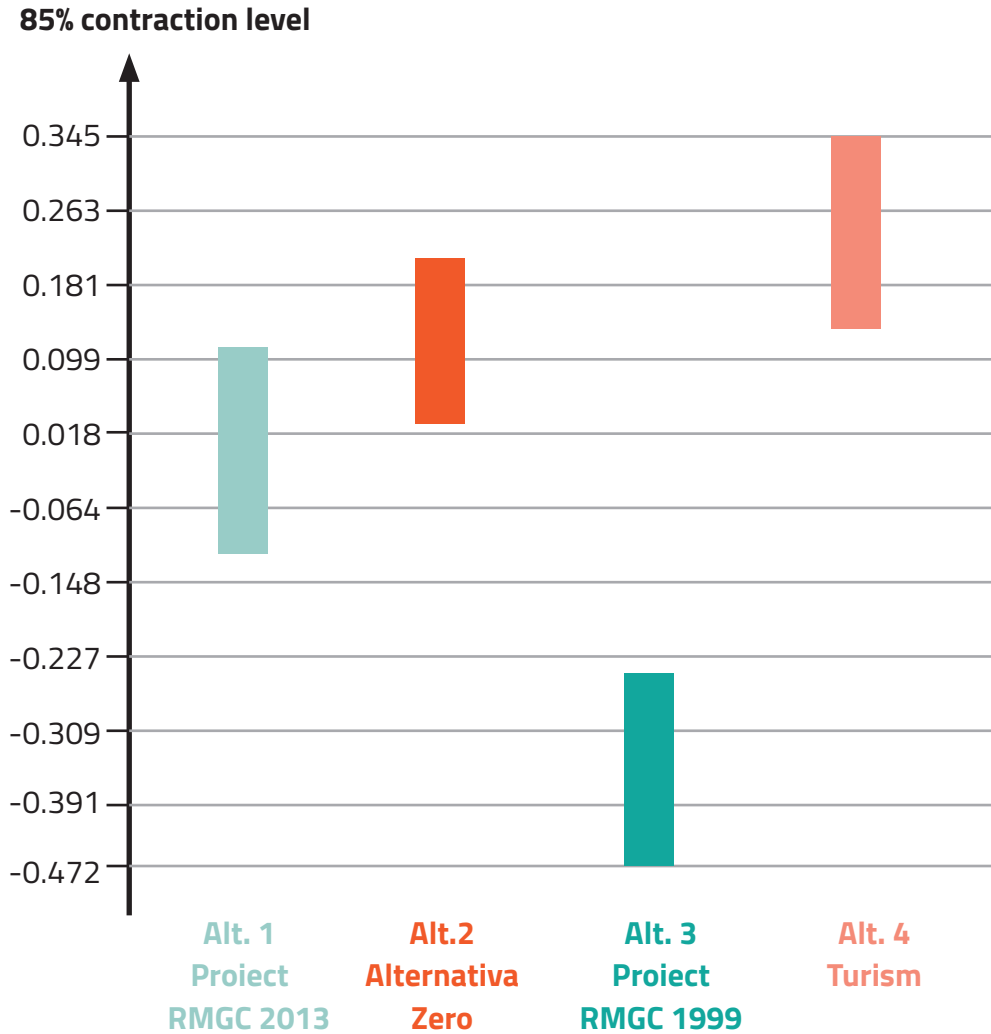


FIGURE 17. Scenario 6. Evaluation of the 4 alternatives

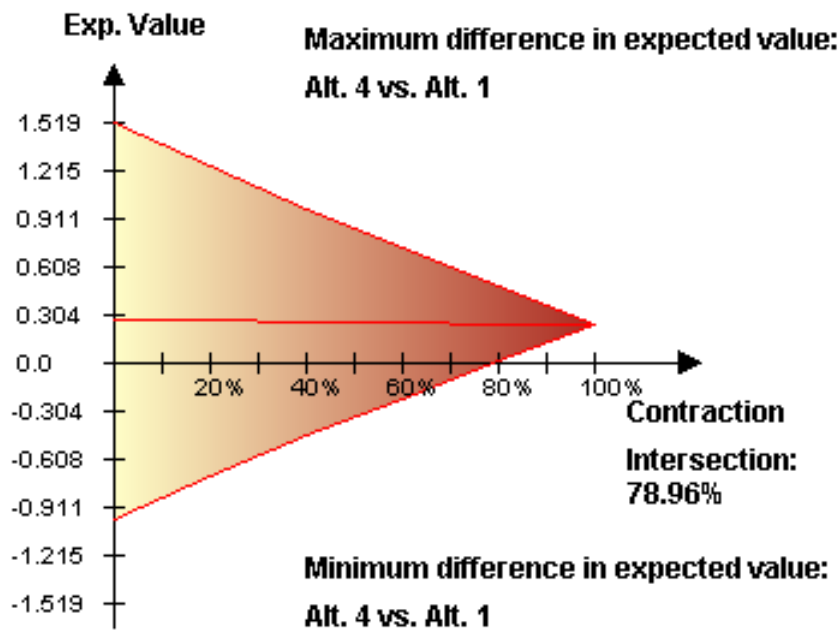


FIGURE 18. Scenario 6. Alt4 vs. Alt1

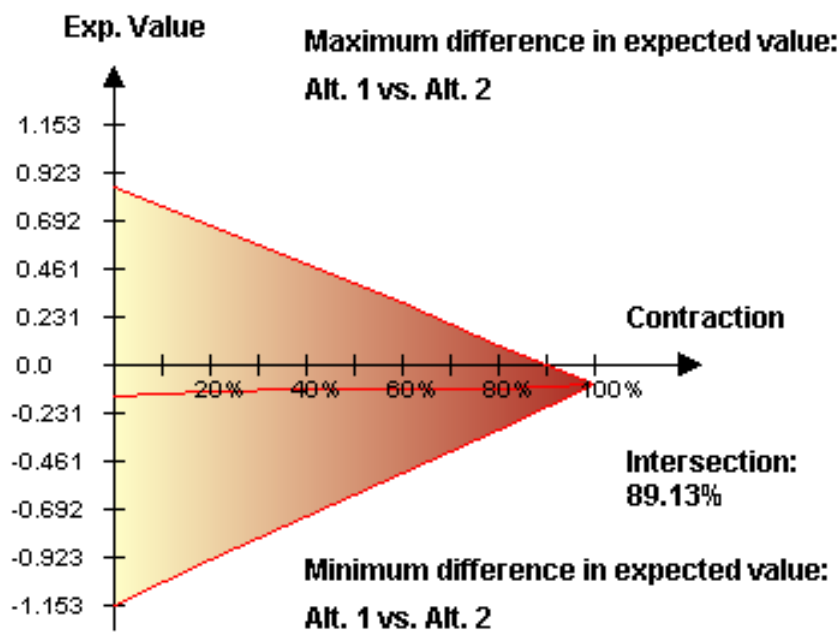


FIGURE 19. Scenario 6. Alt1 vs. Alt2

If we prioritize environment over social, economic, cultural and credibility criteria, then the Zero Alternative becomes the second best after Tourism, which is significantly better than Alt. 1. According to Figures 18 and 19, Alt.4 is significantly better than Alt.1, and Alt.2 is better than Alt.1.

### Scenario 7: stakeholder interest – local community

In the current scenario, we mostly took into consideration the socio-economic impact of all alternatives on the local community. In what concerns the economic aspects, we weighed the potential financial costs and benefits for the local people brought by each option, prioritizing employment opportunities, job trainings, standard of living and economic growth, as well as the impact of each option upon other businesses and employees in the area. To these subcriteria we assigned higher weights than to the subcriteria dealing with the impact of each alternative for the national economy (for this, see Fig.4).

In what concerns the social aspects, we looked at issues such as: the impact of relocations and resettlements, the physical safety and health of the local community, access to jobs, infrastructure, clean water, etc. Choosing to prioritize the social and economic aspects over the rest derives from the worries and interests of the people from Roşia Montană and nearby villages, directly affected by the implementation of any of the alternatives.

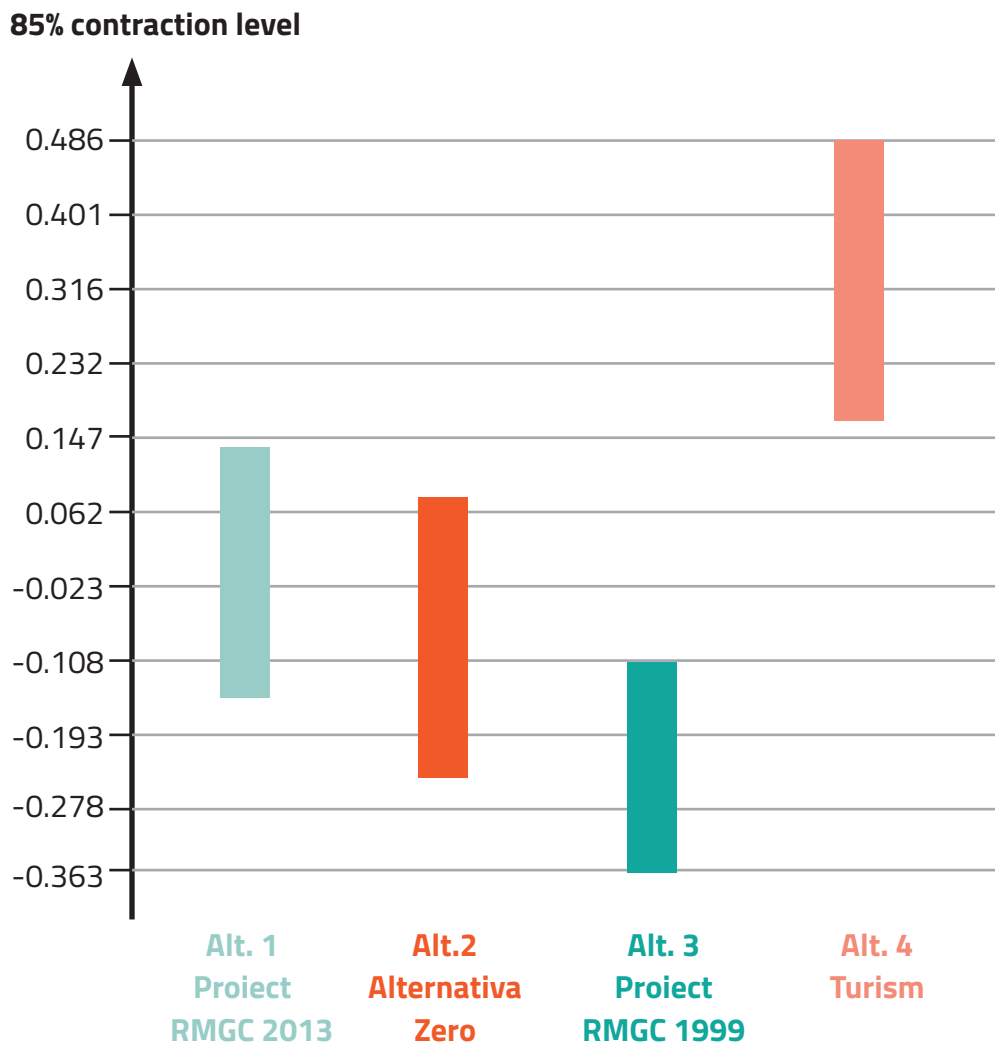


FIGURE 20. Scenario 7. Evaluation of the 4 alternatives

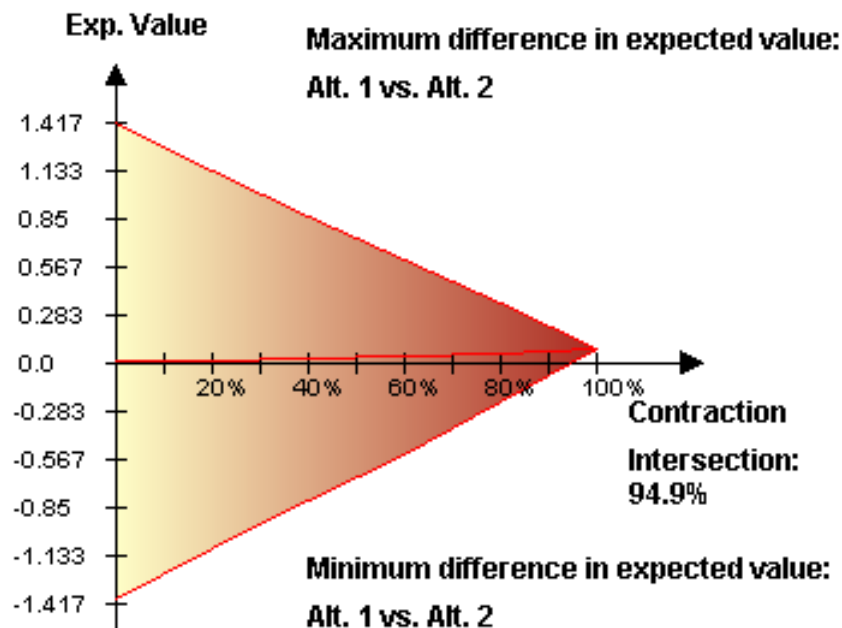


FIGURE 21. Scenario 7. Alt1 vs. Alt2

When the socio-economic impact on the local community is given the highest weight, the Zero Alternative and the 2013 RMGC Project overlap almost entirely. The results from Fig.21 faithfully reflect the divided opinions of the local people in regard to the mining project, a part of them supporting it, and others radically opposing it. Still, we can see that this is another scenario in which a touristic development seems to be the optimal solution for the area.

## Scenario 8: transparency and citizen interest

The legal impediments met by the RMGC project so far have blocked the implementation of the project, but have not yet led to a permanent dismissal of it by the Romanian authorities. A new mining bill has been on the table of discussions and negotiations behind closed doors, which have taken place throughout the years, drawing mistrust and criticism from the opponents who fear that legislation can be bent to suit corporate and governmental interests. The lack of transparency and open public debate on parliamentary initiatives and governmental decisions has inflamed the public opinion, making the credibility criteria more important and relevant than any other. By making Roșia Montană a mono-industrial area and, as a consequence, blocking any other enterprise to develop such as tourism, local authorities

are as well met with mistrust in choosing the best alternative for the area. Thus, the graphs below show the evaluation of the four alternatives when credibility has the highest weight, and all other criteria have smaller equal weights.

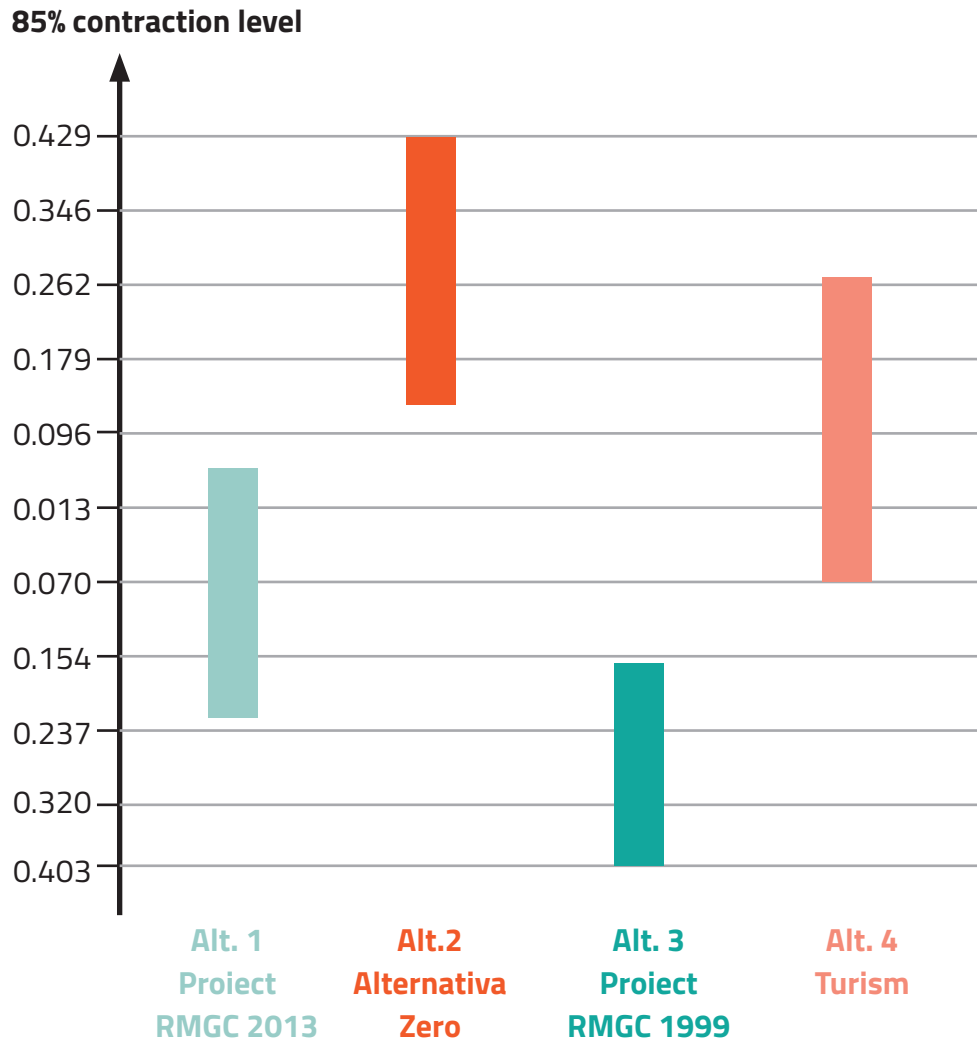


FIGURE 22. Scenario 8. Evaluation of the 4 alternatives

If credibility becomes the main issue, the situation changes to a larger extent. The Zero Alternative becomes preferable, while tourism falls to second place and the RMGC project to third, overlapping with Alt. 3.

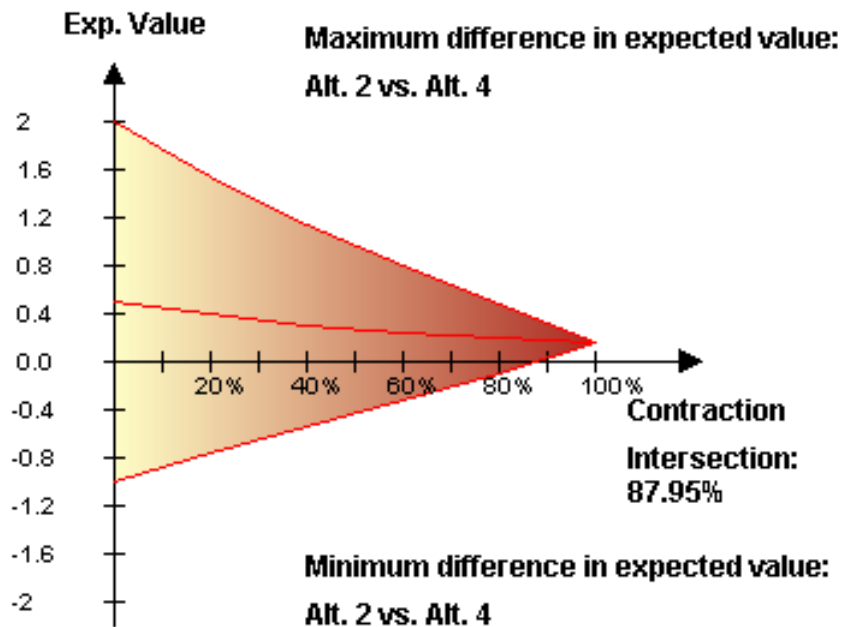


FIGURE 23. Scenario 8. Alt2 vs. Alt4

### Scenario 9: 2013 draft mining bill stipulations

According to Art.3 from the Bill for modifying and supplementing the Mining Law no.85/2003, discussed by the Senate, special public interest projects would be the „mining projects whose economic and social benefits derived directly or indirectly by the state and/or local administrative units are greater than the environmental negative effects; the benefits should be solidly argued and supported by the compulsoriness of environmental rehabilitation in the closure phase of the project.“<sup>55</sup>

<sup>55</sup> see Report of the Committee for economy, industry and services, No. XX/597/02.12. 2013, p.5

The main criteria of concern for special public interest projects would become: 1. Economic and social and 2. Environment; considering our decision tree for Roşia Montană, which can become a „special public interest” project, we eliminate the cultural aspects, as well as credibility, and all sub-criteria from 1 and 2 remain the same. The results become as following.

Thus, if we give higher weights to the economic and social criteria, than to the environment criterion, the best solution for the development of the area is Alt.4, with Alt.1 and Alt.2 overlapping almost entirely.

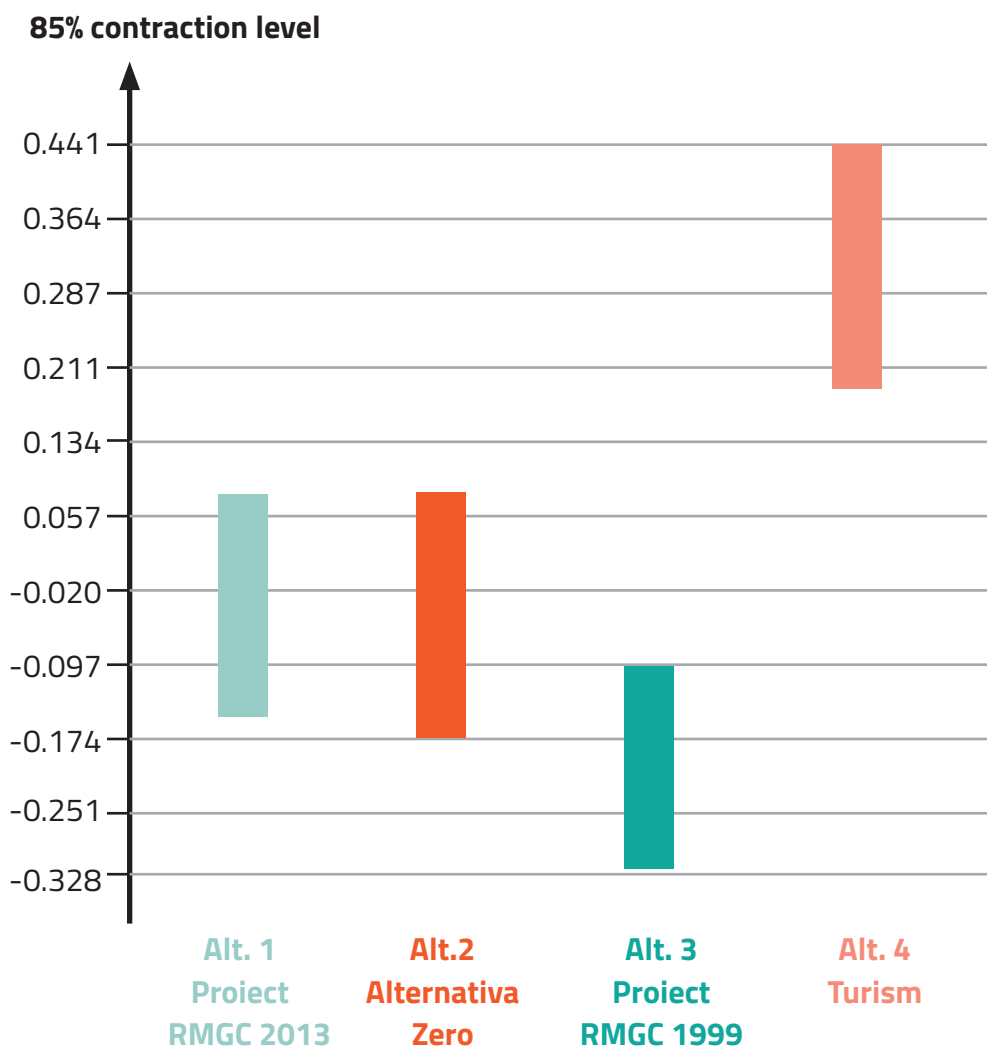


FIGURE 24. Scenario 9a. Evaluation of the 4 alternatives



If we attribute higher weights to the environment aspects than to the economic and social criteria, the hierarchy is the same, but Alt.2 becomes much better differentiated from Alt.1, becoming the second best option:

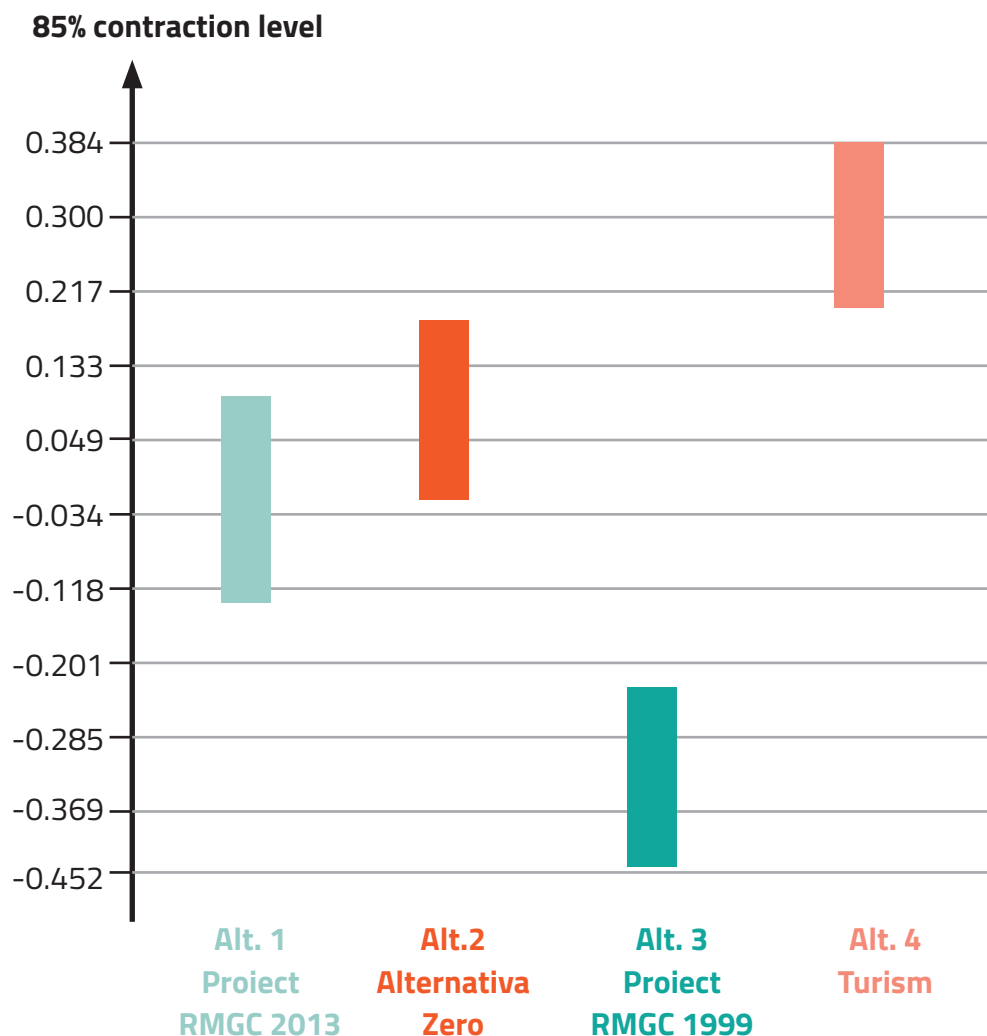


FIGURE 25. Scenario 9b. Evaluation of the 4 alternatives

And if all criteria bear equal weights, we get the same hierarchy of alternatives, with Alt.4 being the best option and Alt.1 and Alt.2 overlapping to a high extent:

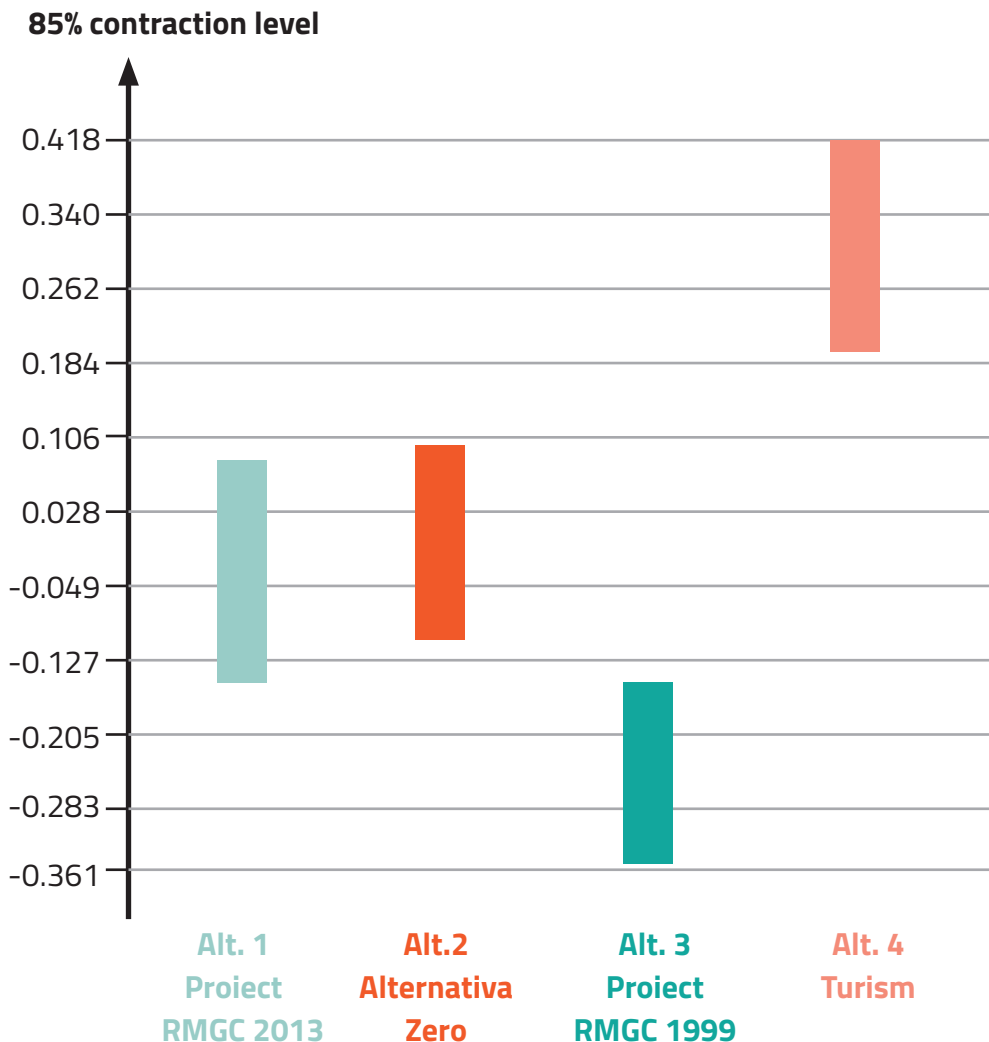


FIGURE 26. Scenario 9c. Evaluation of the 4 alternatives

The clearer difference in some cases can be explained by the higher weights given in this case to the social aspects, as well as by the drop of the cultural aspects, which are now disregarded. Cultural aspects weighed considerably more in the favour of the RMGC project in our previous scenarios, since this is one of the main areas in which they have invested during the last years.

### Other scenarios advanced in the public debates:

1. If a different technology is used in the exploitation, skipping the cyanide leaching process and the toxic tailings raising the environmental concerns, weights would be impossible to estimate within Alternative 1, since Roşia Montana Gold Corporation is not willing to modify the technology. The entire business plan, feasibility and investment studies are built on the present technology. A separate alternative backed by a feasibility study of alternative exploitations of the deposits should be analyzed by the Romanian state or by other investors.
2. If mining legislation is adopted so as to ease the approval of environmental permits needed for the implementation of Alt. 1, the RMGC project, the risks and benefits of this alternative increase proportionally, as they can be replicated in other similar future projects. Also, taking into consideration the release of new licenses for exploration by the National Agency for Mineral Resources, the precedent of the Roşia Montana project can lead to future similar choices to be employed by investors.
3. If we consider the documentation provided by the National Institute of Research and Development in Tourism on Alternative 4, their research and cost-benefit analysis aim at a touristic development of not only the Roşia Montana area, but also of other areas in Apuseni Mountains affected by mining closures after Romania's accession to the European Union. A successful sustainable development through tourism could as well be replicated.

### Research limitations

Naturally, the decision model faced certain obstacles and limitations, most significantly:

- I. The uncertainty of the data and the conflicting evaluations: Probably the biggest problem that we faced was that multiple sources hold conflicting arguments regarding the same issue. Due to the researchers' lack of expertise in the respective areas, the complexity of the issues and the fact that most of the criteria in question are predictions with a high level of uncertainty and controversy, the only option for the analysis was to work with rather vague and gross evaluations, which resulted in a lower confidence in the differentiation between the four alternatives.

- II. Insufficient reliable data for certain scenarios: this was the case for the tourism alternative, where we were able to find only one complex study with reliable, research-based projections.
- III. Lack of proper authorship attribution: the EIA reports fail to mention the authors behind each report, but only list all the institutes, independent experts and companies which have contributed with their expertise (a problem also encountered for other documents). After the EIA was submitted to the Ministry of Environment in 2006, a public consultation followed during which citizens, NGOs, institutes and experts were invited to submit their questions and concerns about the documentation. The questions were sent to the Ministry, but the answers came from the company.
- IV. Citizens' comments on Facebook, blogs or public debates were, as expected, the most imprecise and did not add extra content to the information available in reports, books and articles. The most recurrent issues signalled by citizens and the civil society were translated into the multi-criteria analysis by assigning higher weights to the concerns. Generally, the same concerns were also detailed in other documents, coming from eg. the Romanian Academy, the Academy of Economic Studies, and others, therefore the weights reflected more emitters than one. .
- V. Limited resources: Unlike other, bigger case studies presented in this report that were carried out with the financial support of public authorities, our limited resources did not allow us to organize workshops with the stakeholders involved or employ other means of obtaining a more precise and direct assessment of their position on the topic. This implies both that our research was limited to secondary data, and that a rigorous stakeholder analysis was not feasible. However, the current research represents a well-documented starting point for further, more refined decision analysis that would help better differentiate between Alt.1. and Alt.2., which at the moment are held as the most available options and which, in our analysis, are hard to prioritize one over the other. Also, studies on other potential alternatives can be conducted following our multi-criteria decision tree.

This research wouldn't have been possible without the documentation made available with the civil society protests and journalistic investigations, which released the license contracts and made way for a parliamentary public hearing of the main stakeholders and of the arguments pro and against the project.

## CONCLUSIONS

Drawing on the sensitivity analysis we can conclude that the alternative of implementing the project with the old provisions, dating in the 1999 license, can be dropped, because it is clearly the most disadvantageous of the four options. In addition, in most cases, the Tourism alternative turns out to be the optimal one, but we must take this result with caution because in certain cases the difference from Alternative 1 and 2 is not very large, and because the data available for this option comes from imprecise and uncertain projections. These precautions are reflected by the 8th Scenario, where Credibility issues are prioritized, and, as a consequence, the best alternative becomes that of not doing anything (Alt.2). This is because the Tourism Alternative ultimately depends on political will, investor interest and on how such a project would be implemented. In addition, the 8th Scenario reflects the current situation, where action has been frozen as a result of the massive protests which were to a great extent due to the lack of transparency, the legality problems and the credibility of the whole process.

Another conclusion that can be drawn from the analysis is that with the current data it is difficult to say whether it is better to launch the project in its updated form (Alt. 1) or to not take any further action (Alt. 2). In most cases, these two alternatives largely overlap, or the differentiations are rather insignificant. There is only one scenario where there is a clear hierarchy between the two options: if we value more the credibility, legality and transparency of the process, the situation shifts and the Zero alternative becomes a wiser decision. This result can be translated in a valuable recommendation for the mining company and for the political decision-makers. If these stakeholders want the continuation of the project and its acceptance by civil society, the key challenge is to increase the transparency of the process and improve the credibility and legal aspects, entering an honest dialogue with the civil society, in order to gain people's trust. If these aspects cannot be met, the decision-makers need to pay attention to the alternatives available for a sustainable development in the area.

Future possible directions of inquiry and action:

- Research in cooperation with other member states of alternative technologies leading to environmentally safer mining; cost-benefits analysis, sustainability, range of applicability;
- Expanding the multi-criteria tree with more technical information, leading to a wider number of branches and subcriteria, after gaining more input on: touristic development, local authority plans in case the project is rejected for good, public opinion preferences and perceived risks and needs.
- Alternatives for sustainable development in areas where state-funded mining was ceased.

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