Ivory Coast: New Trends and Future Perspectives by Adopting the New Mining Code

Kouame Joseph Arthur Kouame 1*, Fuxing Jiang 1, Yu Feng 1 and Sitao Zhu 1

1 School of Civil and Environmental Engineering, University of Science and Technology Beijing, Beijing China

Abstract. Although the Ivory Coast may have received the award for the best ‘mining code’ in the world (ahead of Finland) and whilst it may be a preferential destination for foreign investors (due to its abundance of natural resources and rapid economic growth), the mining sector still remains rather undeveloped. The proportion of the population in abject poverty remains decidedly high and the country’s economy has invariably always been grounded in agriculture. The current government is trying to find ways and means of reforming the mining sector in Ivory Coast to align it with international standards thereby making it more attractive to potential foreign investors. The challenge to turn the artisanal gold extraction into developed mining activities will be possible in this case if the new mining code is effectively adhered to in due process by the people involved in the mining sector. This paper predominantly deals with the role of good mining code in the mining sector.

Keywords: ivory coast, mining industry, mining code, ASM

1. Introduction

Ivory Coast in the western part of Africa has a strong base of economic growth and a profusion of natural resources. Several mining deposits have been discovered and put into operation. The South African mining company Randgold currently runs Tongon gold mine in the north of the country. The British mining company (Amara Mining) will commence operations in (2017) to run one of the largest gold mines within Ivory Coast. Amara Mining is going to invest over $400 million in Angovia gold mines located within in the Yaoure region [1], [2].

Despite the aforementioned natural resource wealth, the population livelihood is so dire owing in large part to the political unrest in 2002 and the post-election crisis in 2011 [3], [4]. In particular, the xenophobia, discrimination, lack of employment, inadequate infrastructure, insufficient education and exclusion are the main contributing factors in the Ivory Coast. Businessmen from all the parts of the world are taking advantage of this situation to exploit the rich mineral resources of the country.

Ivory Coast has become one of the places where the enrollment of both genders involvement in artisanal mining is recurrent.

Many men, women and even children are involved in artisanal gold mining and diamond extraction and are choosing to work in this high risks sector due to the high rates of poverty and unemployment [5], [6].

Traditionally, the Ivory Coast has been known as the world’s largest and primary cocoa producer, by dint of this, its abundant mining resources didn’t warrant as much attention. Concomitantly, much of these resources remained unexplored and many known deposits are still underdeveloped as a legacy of this past approach. Currently, more than 30 mining companies with global operations are exploring across the country. This profusion and subsequent development of mining resources can contribute to the country fees, dues and taxes with the upshot being the potential for an economic boom. Investment of huge sums of the country’s
annual revenue in expansion of the mining sector can represent a major fillip for the economy of Ivory Coast. Although the current government shows a positive attitude on financial support for these ventures, proportionately the investment is much less vis-à-vis agriculture. Hence, therefore why the new important source of livelihood for many people today in the Ivory Coast is artisanal gold mines? Foreigners and the indigenous population are all attracted to this lucrative activity because of the high price of gold [7], [8].

Artisanal mining extraction activity in Ivory Coast remains a very real fact. There is a significant lack of technological means for mining extraction. The use of rudimentary tools and outmoded machinery combined with the lack of information in the mining sector make mineral extraction a slow and tortuous process. There is not enough technological expertise or stratification to recognize the necessity of mining mineral districts that focuses on deeper drilling. Besides, there is also insufficient logistics to collect, store and distribute the mineral outputs. As a result of the fact that the lack of exploration and development has acted as a constraint on the potential rapid growth of economy, the current government has paid more attention to mining development than ever before [9].

Artisanal and Small-scale mining (ASM) is analogous to informal mining activities due to the fact that the miners don’t use sophisticated machinery and high technology combined with the lack of (or very minimal use of) machinery is prevalent across the country. It is impossible to know the exact number of people involved in the artisanal gold mines and also the number of illegal mining sites operating in the Ivory Coast. Nevertheless, the working estimation according to the state’s mining company (SODEMI) is that over 5,400 people are actively working in or around any of the 300 illegal mining sites; located in 21 of the 36 regions of the country. That’s why the current government has decided to close most of the illegal mines sites because ASM invariably leads to death of miners [10].

2. Method

The Methodology describes in detail how the study was conducted, including conceptual and operational definitions of the variables used in the study. Different types of studies will rely on different methodologies; however, a complete description of the methods used enables the reader to evaluate the appropriateness of one’s particular methods and the reliability and the validity of one’s results. It also permits experienced investigators to replicate the study.

2.1. Description of Kong

As a working example, this paper uses Kong as a case. Located in the northern part of the Ivory Coast, Kong is the under the purview of the department of Ferkessedougou. Formerly the Capital of the “Kong Empire” from 1710 to 1895 the vegetation of Kong is savannah, which is prosperous for cotton culture. Moreover it is home to a majority Muslim ethnic culture, further, the populations of Kong speak Dioula and are mostly farmers, traders and workers of that ilk (Fig. 1).

![Fig. 1: Location of Kong](image-url)
Nowadays, Local people and foreigners including women and children of Kong are predominantly working day and night in the illegal mining sites located in this part of the country. Miners conceive the ASM as a being a great opportunity because it provides employment; it can increase local purchasing power, stimulate local economic growth, reduce the high poverty rate and also lessen urban migration. However, the recurrent death of miners and conflicts between miners and indigenous locals are challenges the current government must imperatively face [11], [12].

2.2. Artisanal Gold Mines

According to Kone Moussa (a 56-year-old man), the artisanal or small-scale mines always lead to environmental problems:

“I was born and raised here in Kong, before I was farmer but now today I move to mining site to get much money because the environment is damaged, it is not fertile anymore for agriculture due to the intensive exploitation of gold everywhere. Due to the fact that there is no transparency contract, miners are operating everywhere; they just move one to place to another one as long as they can find gold.”

When asked how artisanal miners may know that there is gold in a particular place, he identified that: “They have their own tools to explore the lands, last year (2013) they told me that they had found gold in my cotton plantation so they are going to mining there and it will take five years. The sum of money proposed is enough for me and I never earn that sum of money from cotton during 10 years. I just yield my lands to them.”

As Dosso Alioune, (35-years old) contends, artisanal miners are welcome in their regions:

“They are everything for us, since miners are here the high rate of poverty has greatly reduced, there is job for everybody, and we can earn money fast and schooling our children. There is no good equipped clinics and hospitals here, when someone is seriously sick or a pregnant woman needs good medical care to give birth, only miners will take their cars and drive them to Korhogo or another big city where there is good hospital…They help us a lot.”

Cedric Traore, (a 19 years old high school student), highlights the high-risk nature of working in an artisanal gold mine:

“I am from a poor family but I will never go to any mining sites. People run every day to reach mining sites for money and better life but it is really dangerous. Many students work there during the holidays and some come back, some die, some drop out from school because of money. All the lands around are occupied by illegal miners, there is no place for those do not want to risk their life working in mining sites to do their agricultural activities. I appealed the current government to do something because the shafts and pits are abandoned, the human rights are abused, the child labor is recurrent here, our river is damaged, air pollution to high due to fact miners are using mercury and others toxic products.”

What one can elucidate from these examples is that artisanal gold mining in the Ivory Coast lacks the necessary implementation of an adequate mining code in large part due to the lack of political support perhaps owing to the ‘attractive’ incentives in the mining sector. It is also apparent that there is an infrequent revision of mining code for a policy of sustainable development in the mining sector. This combined with a non-extension of existing legislative texts relating to the environment, such as simple documents or emissions (mass media) to accelerate their adoption, implementation, and to raise awareness on a national basis. Moreover the low capacity of enforcement in the sector, growing insecurity in mining areas, hesitation of foreign investors are due to the political insecurity in the country.

The effective application of the new mining code as offering a potential solution should be considered.

3. Results: New Trends and Future Perspectives (The Adoption of the New Mining Code)

A good mining code is a great decision support system designed especially to attract foreign investment and support. Firstly, the strength and vitality of the mining code will secure the mineral resources of Ivory Coast. All the mining sites will be identified and located due to the necessity for transparency. The current government will subsequently find the right method in order to facilitate the analysis of the geographical and
geological data for further exploration and exploitation of the country’s minerals. The different types of minerals will therefore be graded. As a result the government will be able to control its own mineral resources before appealing to the investors. The business agreements between the Ivory Coast and foreign mining companies will be relatively straightforward to draft given that the necessary details are easy to come by owing in large to the transparent nature of the preceding contracts (Fig. 2). The government of Ivory Coast will benefit greatly from the advantages that these new technologies brought about by the modern foreign mining companies. The mine’s lifetime will be estimated according to the location of the minerals in the National territory. After a proper exploration and a robust and detailed analysis of the mines, the investors in the mining sector, across the world will be privy to information about the mineral potential, the size of the minerals existing in Ivory Coast. Concomitantly, they will also know about the governmental system of the Ivory Coast.

![Fig. 2: the recommendation structure](image)

The administration in charge of the mining sector in the Ivory Coast will proceed to engage in the partnership procedures with other international mining companies in order to develop the mining sector. The Ivorian Government will ultimately reorganize the mining industry because of the excellent and promising results. Since the exploration and mining permits will be granted during the process with transparency, then accordingly it is reasonable to suggest that the national GDP will increase and the aspiration of the current government to make transform the Ivory Coast into a more prosperous nation in the coming years will conceivably become a reality.
The implementation and contribution of a new mining code will play a major role which will eventually lead to good mining practice in the Ivory Coast. The current president Alassane Ouatarra is actively engaged in elevating the livelihoods of his people in Ivory Coast. The new mining code comes to identify the people who are operating in the mining sector and to know the real problems directly impinge and affect the local people while operating mining sites. The government of the Ivory Coast will be informed of any malpractice, flouting of the mining code or the bad physical condition and/or caring of the local people any environmental degradation accordingly, any governmental response will be able to attend to their needs. The traditional methods used in artisanal mining will be revalued and replaced by the new technologies. The local people will also benefit from several salutary effects such as the promotion of employment, schools for children (children go to school instead of working in illegal gold mines). Some roads and even towns will be built in these areas. The abject poverty will be reduced.

4. A Comparison with the Chinese Mining Code

It is commonly agreed that mining in China has developed over a longer period, and significant achievements have been derived in the surveying of China’s mineral resources over the five decades since the founding of the People’s Republic of China. With the government’s centralized management as precondition, diverse-economy-sector mining company as the main body, Chinese government macro-controls the market while the latter allocates mining sources and companies operating autonomously. As the mining sector continues to develop rapidly, mine exploitation is having a tremendous (and detrimental) impact on the natural environment; leading to environmental pollution and degradation whilst causing ecological damage. Over the past 20 years, the Ivory Coast’s mining sector has been on a similar developmental trajectory to that of China; in that their extensive mining operations have been developing at the expense of the environment. Nevertheless, it is now widely accepted that China now recognizes that unless a ‘green’ cyclical economic approach is introduced alongside the strategic aims of the national economy, then sustainable development will not be achieved. Accordingly, China itself, has taken some measures to optimize its industrial mining practices in relation to future sustainable development.

Ivory Coast is one of the poorest countries in the world with 50 percent of the population living below the poverty line (Fig. 3) [13]. In recent years, the economy has been growing rapidly owing largely to the expansion of the gold mining industry and diversification in the agricultural sector. The mining industry plays a significant role on Ivory Coast’s economic development. For instance, mining provides employment directly by recruiting local people on the mining plants and indirectly through the mining contractors and suppliers who provide the mines with equipment and explosives. Nevertheless, despite the large contribution to production made by mining industry, the industry does not contribute to GDP as significantly as one might surmise. The GDP sartorial composition is as follows: Agriculture 20.8%, industry 30.6% and services 42.5% with the mining sector contributing only between 2% and 5%, which is proportionally the same as China. Moreover, gold production in the Ivory Coast by its nature entails a lot of high outputs, namely pollution, environmental degradation and loss of biodiversity. Equally, the same can be said for China, in terms of the pernicious effects of mining being an all too common effect of such intensive mining practice.

Fig. 3: Statistic of ivory coast GDP, demography, poverty and education (source NIS)
### Table 1: Mining economic indexes between China and Ivory Coast

<table>
<thead>
<tr>
<th>Comparison</th>
<th>Gold production</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual production</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivory Coast</td>
<td></td>
<td>5.32</td>
<td>10.68</td>
<td>9.83</td>
<td>12.66</td>
<td>168</td>
</tr>
<tr>
<td>China</td>
<td></td>
<td>3418</td>
<td>3606</td>
<td>403</td>
<td>428.16</td>
<td>451.8</td>
</tr>
<tr>
<td>Growth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivory Coast</td>
<td></td>
<td>169%</td>
<td>100.75%</td>
<td>-15.9%</td>
<td>28.79%</td>
<td>32.7%</td>
</tr>
<tr>
<td>China</td>
<td></td>
<td>52%</td>
<td>58%</td>
<td>116%</td>
<td>62%</td>
<td>55%</td>
</tr>
<tr>
<td>Mining sector Contribution to the national GDP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ivory Coast</td>
<td></td>
<td>2.0%</td>
<td>2.8%</td>
<td>3.3%</td>
<td>3.6%</td>
<td>4.8%</td>
</tr>
<tr>
<td>China</td>
<td></td>
<td>1.6%</td>
<td>1.9%</td>
<td>4.0%</td>
<td>4.4%</td>
<td>5.2%</td>
</tr>
</tbody>
</table>

**Fig. 4: Mining economic indexes between China and Ivory Coast**

In terms of growth, the above chart (Fig. 4) highlights that in particular the Ivory Coast has made astonishing progress in its gold mining. The part of year growth reaches a high rate of 100.75%, whilst, part of year growth declines by -15.9%, which demonstrates that the gold mining is undergoing some unbalanced development. In relation to China, the country has sustained a steady growth with an average of 6.8% over the past 5 years. This demonstrates that the mining sector in China is more robust than its counterpart the Ivory Coast. One the other hand, the mining sectors of both China and the Ivory Coast has the same relative contribution to their respective national GDPs with an average of 2%~5%. Therefore as a corollary of this, one can determine that both the counties are still developing (less economically developed countries) by dint of the fact that their specific mining sectors are an abnormally low proportion of their national income.

Based on the figures above, we can import an economic equation as follows:

\[ V = \frac{F}{C} \]

V stands for Value; it means the mining sector contribution to the national GDP.

F stands for Function, it represents mining industry production and its growth.

C stands for Cost; it refers to mining methods and production cost.

As seen from the above equation, we can amplify the Ivory Coast’s mining industry as an illustrative example. It shows that the mining sector contribution to the national GDP can be kept at an optimal level if the mining industry’s production and growth increase. Moreover, this may be facilitated if the mining methods become more advanced and optimized or the production costs diminish. On this occasion, we can obtain the greatest gains and cost-effect in mining production.

While the Ivory Coast’s mining practice is still heavily predicated on the artisanal mode of old and inefficient growth combined with high-energy consumption and serious pollution. The distinction between
this and the Chinese model lies in the fact that the Chinese approach to mining has been reformulated to adopt the ‘green’-ecological mode of excavation.

5. Chinese Mining Policies

In the case of China, mineral resources represent an important material base of development for its national economy due to its preponderance of traditional mining conglomerates. A great number of mineral resources have been verified, and a fairly complete system for the supply of mineral products has been established. This has provided an important guarantee for the sustained, rapid and healthy development of the Chinese economy. China attaches great importance to sustainable development and the rational utilization of mineral resources, which has made sustainable development a key national strategy with the protection of resources an important part of this strategy. A series of measures have been implemented to increase the domestic supply of mineral resources owing to the fact that China relies heavily on the development of its own mineral resources and other natural resources in order to grow its economy. Firstly, China strengthens the exploration and exploitation of energy mineral resources, striving for a rational distribution of regional geological exploration and exploitation of mineral resources. China is also accelerating the structural adjustment of mineral resources exploitation and utilization and raising the level of multipurpose utilization of mineral resources. Besides, the policy of saving energy and reducing consumption (lessening of inefficiencies) is also taken into account. China is also establishing a system for the reserves of strategic mineral resources. As for the mining trade, China gives further encouragement to foreign businesses to invest in China. Further the improving cooperation and collaboration with foreign companies in prospecting and exploiting oil and gas resources and encouraging foreign businesses to make investment in exploration and exploitation of other mineral resources. Generally speaking, the green-ecological mining policy combined with overseas foreign direct investment is the basic policy of the Chinese approach to mining.

6. Conclusion

Artisanal gold mining in the Ivory Coast indubitably impinges on livelihoods of local people. It provides employment; in turn reducing the high levels of poverty. Because of artisanal gold mines some parents can earn a significant amount of money (alongside the current solitary and ubiquitous source of income agriculture) to pay their children school’s fees. This paper mainly suggests that besides agriculture (which is the most practiced sector in the Ivory Coast) the government should seek to diversify and invest in several other economic sectors with particular reference to the mining sector to strengthen the national GDP; by immediately adopting the new mining code. The decentralization of the activity sector as new trends and future perspectives due to the advantages granting to the rural people by the new mining code will play great contribute to the development of the mining sector. Foreigners and local people will both be stakeholders, involved in the mining activities with efficient due process. The recurrent conflict between local people and miners will be ameliorated because we will assist efforts to improve the relationship between the government and local people.

7. Acknowledgments

I am so thankful to God my confident and my supervisor, Prof. Jiang Fuxing, whose encouragement, guidance and support from the initial stages to the final level enabled me to develop an understanding of the subject.

Lastly, I offer my regards and blessings to the authorities of my university, (University of Science and Technology) for their kindness and emotional support, Mr. ASSOUMOU Kouame Marius (Service Chef at Ministry of Mines and Industry Ivory Coast), SODEMI, local people from KONG, and to all of those who supported me in any respect during the study of this project.

8. Reference


