

The Effect of Mining Exploit for Environment in Quang Ninh Province

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Key words: Environment, mining exploit.

SUMMARY

The environment of coal exploited and produced areas have been degraded, polluted and having dangerous problems. Combination of the temporal images digital processing method with sample taking, outside analyzing and GIS technology is used to monitor environment.

The mining exploitation process makes the terrain and geomorphology of coastal zone changed from Hoanh Bo to Tien Yen. The quality of above and under ground water is heavily polluted. Moreover, the forest is being changed that makes ecological environment unbalance in whole province including Ha Long Bay, one of the world natural heritages.

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1. INTRODUCTION

Coal exploitation activities in Quang Ninh have negative impacts to the environment, namely water environment, land environment, and ecological environment. In all the cases both land and coastal areas are affected, but mainly it's more impact on land. Literature survey and research activity shows and analyzed that areas affected directly from the coal exploitation which is mainly along the town of Mao Khe - Town Uông Bí through Ha Long city - Cam Pha Town and part Hoanh Bo district and the coastal strip from Ben Can to Cua Ong port and the Cai Bau island.

Active process of exploiting and processing of coal in Quang Ninh province not only has negative impact to the environment but also directly or indirectly impact to the shore along Ha Long Bay and Bai Tu Long via runoff of surface water (rivers, streams and water flow to the sea) and wastage disposal from factories. The areas mainly affected from coal exploiting and processing are Cuoc Be Bay, the town of Cam Pha area, Hon Gai, Cua Ong coal port, and coal factory Cau Trang.

2. METHODOLOGY

Remote Sensing Method: For the present research LANDSAT (1986) and SPOT (2002) satellite datasets have been selected. Digital image classification has been performed after geometric and radiometric correction (image enhancement); first pre-field visit was done to have an idea of different features classes existing in our study area. Unsupervised classification was initially performed on LANDSAT (1986), SPOT (2002) and aerial photo (2005) for an idea of the spectral reparability of the feature classes. An extensive field survey was done with the priori knowledge using the unsupervised classification to identify sample points in the imagery for different feature classes at various locations using GPS. Based on the collected sample sets for respective feature classes training sets were selected in the FCC imagery for supervised classification using MLC (maximum Like hood classifier) classification.

Methods of the field research: Gathering raw data directly in the area of research, detailed discussions with technical expert in the factories and coal mines in order to learn more about the study area hence it is used for production of technical status in real basis.

GIS method: Use the compatible software to build the geodatabase and analysis of data by the principles of the spatial analysis

3. BASE MATERIAL

For this study below mentioned base materials have been used

- Satellite images from years 1986 - 2005
- The digital terrain of Quang Ninh
- The reconnaissance field survey
- Directory of statistics,
- the report of environmental impact of coal mining province of Quang Ninh over the years

4. CHANGING TERRAIN AT GLANCE

Process of exploiting and processing minerals from the natural surface, resultant the destruction of natural land structure and its direct impact to the environment. These new changes of surface terrain extended over the large area. With mining activity extended over the sea shore area and cover the natural land surface.

Until now, due to terrain exploiting of open-pit mining with waste areas occupied a large area and cause serious pollution of the living environment of nearby residential areas. Region Hon Gai - Cam Pha, polluted mud has negative impact on a large area accounting of 5,749 ha (accounting for 14.2% of the area). In this issue, Open-pit mining occupies 1,008 ha; underground mining pits 2296 hectares, 899 hectares of waste area, the area left is the factory service for exploitation: 16 546 ha. Major mines Tu Ha, Tan Lap, Nui Béo from 1973 to the present area of 933 ha were fraudulent waste on land with 256.38 hectares. With the scale expanding, exploiting the increasing depth, the surface changes the terrain mines will become deeper, larger. The terrain changes clearly see this in the area Deo Nai - Cao Son, Mountain has been extracted so much now the height of mountain became flat and also it became 200 meter deep to its surrounding areas. And on the Cao Son flank with the 5-6km long ribs was become slopes waste ($> 35^\circ$) with a straight profile. The terrain changes, it depicts clearly in the Deo Nai, Coc Sau. The area where exploiting the coal mining creates a Central closed on top and on the flank depth 100m, 1km radius near or connecting to one another long 2-3km (from Deo Naito Coc Sau). On top of Cao Son mountains, land and rock from the area where exploiting the coal mining is measured, on the right flank to create the new style ribs with a high-pitched kind, created by the loose and unconsolidated rock has not mounted, and it easy for landslide prone area.

Survey results show that: The area where exploiting the coal mining has been exploring the old, and it become very big waterbody. That type of terrain is completely new as a Para (Tri Lo), a Tu Ha lake, a Trang Bach lake ... Surface area of lake where they reached 200 000 m² vertically to 45m deep water.

The rock and waste land make abrasion process or abrasion-accumulation process to accumulation completely. Waste floating down the area is supplying materials for the alluvial circuit and causes of the accumulation process a excessive destruction as the mangroves from the Hon Gai, Ha Tu, Ha and Cuong even the foot of the mountain stone lime area Quang Hanh

Exploiting coal and the rock waste have made changes coastline, and also decline in coastal ecosystems from Cua Ong to Bieu Nghi. Through analysis of research data from satellite images through the years 1969, 1974, 1985 found that coastline have changed a lot. In 1969, between Hon Mot and the coastline near the town Coc Sau is streams rive, now no longer available. In general, coastline increase to the sea day and day with speed 30 - 40m/year, that is, from 1969 to the present coastline increate to the sea has 500-600m, in separate Hon Mot town is 600-700M.

On the other hand, due to current needs with construction, people and the enterprises have taken waste rock to fill in the sea, for example, areas of cultural Hon Gai, the Cao Son mine to the sea has a several thousand metes.

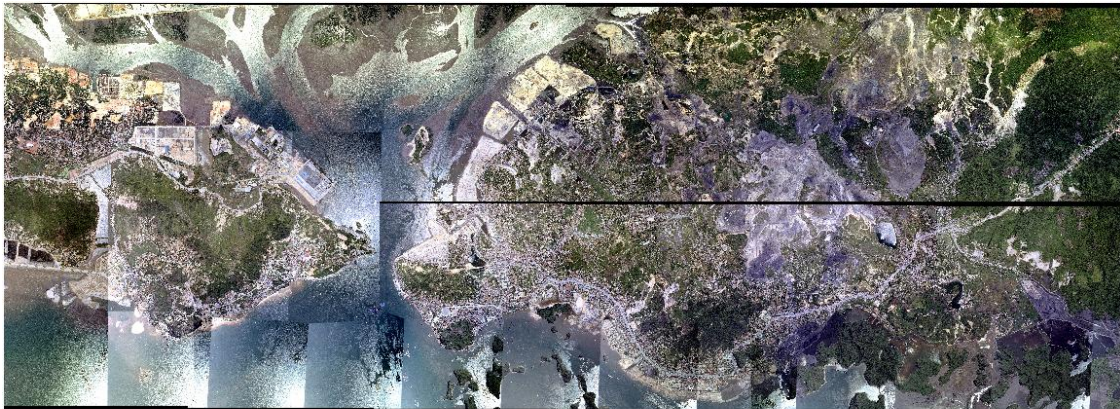


Fig1. Aerial photo of Cua Luc – Quang Ninh taken in 2005

5. CHANGES IN LAND

Exploitation of beach pollution and degradation as quickly area cultivation. Besides the exploitation of mines also affect land by the cancellation and has brought such a range of influence it will more broadly. Analysis results showed that waste rã often preclude the resolution Fe, NH_4^+ and SO_2 , affect the costs of land and is harmful to the environment. Waste on the beach and room to room to create the shell model have ferolit $\text{pH} = 4.4-5.9$; the oxygen of HH 140-190 = mv, creating acids that land, not suitable for crops. Besides the function of elements in the shell room of this type do not allow values ($\text{Cr} = 63.5$

ppm, Co = 8.2 ppm, Mn = 149.2 ppm), the land becomes less fertility, less ability for plant development. Land on the beach pollution are functions of radiation higher than other land, but lower than clay and clay, specifically U = 17.3 ppm, Th = 22.5 ppm, K = 17% clay than U = 21.4 ppm; Th ppm, K = 19%. Land along the roads, to the platform floor, the beach landing point with function of U, Th, K higher than the normal land affected by dust, clay powder, the waste land. Land in the mining pits Celebrate function have exploited the element of radiation higher than both, U from 17.1 to 33.6 ppm, Th from 8.5 to 33.6 ppm, K from 1.5 to 2 , 8%. Thus, the source contains elements of radiation as land, mining pits, Celebrate exploitation is mainly clay, the clay powder and the powder.

Due to the development of coal exploitation and processing of coal, agricultural land has been narrowed significantly. The individual mines with Cam Pha area of 600km², population 145,000 people over the period 1985 - 1989 has lost 69 hectares of agricultural land of which 30 hectares of land growing rice. At this rate of loss of land also increased more

6. CHANGES TO FOREST RESOURCES

Past three decades, forests in Quang Ninh is important resources, which tasks focus is to provide wood pillars, open to exploitation than. At the beginning of 80th year, forestry sector in Quang Ninh annual provided 55.000m³ to 65.000m³ wooden pillars mines. In addition, the exploitation is about 1000 - 1200 tons of plastic, hundreds of broken cinnamon for export and many other forest products.

However, in recent years, due to the exploitation of forest clutter, forest resources in Quang Ninh are becoming exhausted.

Due to extraction of forest it not only lose the area of forest cover but also its impact to the environment, causing soil erode, as the source of aquatic exhaust on the dry season, decreased ability to regulate flood rainy season, lose the beauty of natural scenery, take the residence of many animal species, disrupted ecological balance

Currently, production of coal exploitation through open-pit products account for 60-70% of coal annually. With the exploitation of open-pit, the mountain peaks are plane, squash into deep ditches, and of course will lose the vegetation classes.

To expand the enterprise and service of mining production was impacted; lose some area of land cultivation, especially the vegetable. For example, in 1975 co-operative Cam Binh has 65 hectares of vegetable green, beginning in 1980 only 18 ha. Coc Sau area before 1975 with 27 hectares of rice, vegetables, fruit trees, now only 8 ha.

Special status exploitation than previously clutter is the danger of the environment in general and biological environment in particular, because not only reduces the area of forest, lose the reduction of biodiversity which also cause damage to agricultural production, while industry accounts for a ratio of no more but a vital area of rural residents.

7. CONCLUSION

Activities exploiting open-pit and underground mining pits have caused destruction topographical surface area, cannot be retrievable. The flow of waste rock in mines and waste area from factories to recruit coal causes serious pollution to water and the coastline. Not the stability of waste area and waste erode area was caused by river system fill, but also loss of agricultural land and effected to life of the residential area nearby. Destroy a large area of forest land occupied by the open space of open and tightly against the wood stove.

Exploiting coal in Quang Ninh general area, Hon Gai - Cam Pha in particular had a long tradition and important national economy, a source of energy mainly by industrial Vietnam, on the other side it also has important in export so it contribute fiscal earning. Coal industry has created employment and income stability for the nearly 7 thousand workers and their families. Therefore, the exploitation than is required objectivity. However, it should have proper planning, long term of exploitation and consumption in order to protect the natural environment to exploit coal in Quang Ninh to develop a sustainable manner.

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