Road to Constitution: Federalism and Natural resources of Nepal – 2

Photo

Sunil Pokhrel

Mineral, Aggregates and Sand, and Electrical Energy: Which district is rich?

Minerals: The probability of economic benefit

It is anticipated that various types of minerals (Like Iron, Gold, Uranium etc.) are available in the geographically diversified land of Nepal. In the last century, evidence found that some iron and copper industries were in operation. These operations are almost vanished in the present day. The detailed surveys of all types of minerals are not available yet. However, the preliminary survey indicates that there are 62 types of minerals are found in Nepal.

The department of Mines and Geology, Government of Nepal has done detailed survey in 25 districts. They found that 13 types of minerals have good quality and economically viable. The detailed survey also informs the available quantity of the minerals. This article is mainly based on the data published by the department (shown in Table 1).

Table 1: Available quantity of minerals in districts

The analysis, in this article, is done for the above 13 types of mineral that are economically viable according to the department. Because the availability of minerals is not enough for the prosperity of the country; it is benefitted if its cost of production is lower than the market value.

This analysis is based on these assumptions.

- Only those minerals are considered that have declared quantity and economically benefitted.
- Ten percentage Royalty from minerals exploration are calculated.
- The total duration of the exploration are considered for 500 years. Some mines may empty in less time others may go for decades. For example, in South Africa, the gold and diamond mines are continuously operated since 350 years and will be explored many years in future too. Based in this example, the minerals benefits are divided in 500 years in Nepal. However, the benefits may increase of decrease based on the mineral production duration which may vary based on its available quantity.

- The prices of minerals are taken from the London Metal Exchange if that are not available in the Nepalese or Indian markets.
- The tax and other income generated from the activities such as employment, import of machines used in mines etc. are not calculated in this analysis.

Based on above assumptions, Dolakha district is the richest in minerals where world's best Magnesium Carbonate is available in huge quantity. Table 2 provides the mineral potential and its income in each district.

Table 3: Tax and royalty income potentiality from minerals in each district

Stone, Sand, and Aggregates: Probability and Advantages

Stones and sand are available in almost all districts. Some have more than their internal needs whereas others have to import. In totality, all the Terai districts have excessive quantity of stones and sand. These stones and sand are exported into India in huge quantity each year from these 23 districts.

Many major cities such as Kathmandu, Pokhara, and Biratnagar etc. are importing huge quantity of stones and sand from Terai districts. However, the tax income from these import are not considered in this analysis because of unavailability of the reliable data. The Table 3 shows the tax income from stones and sand export to Indian market.

These assumptions are made in calculation of tax income from export of stones and sand.

- The data on available quantity of stones and sand are found in each region and it is later divided in districts in that region.
- The point of origins of the stones and sand are located in mountain. Therefore, it is fare to provide the fruits of the income to those mountain districts but because of the lack of exact data about the origin of stones and sands, the income is not redistributed to mountain districts.
- The income is equally distributed to all those districts if the river flows touching those districts.
- There are no clear directives about the extraction quantity of stones and sand from river basin each year. However, to protect the environmental impact, I proposed to extract only one tenth of the available quantity each year so that the original width/deep can be protected.
- Calculating based on these assumptions, the current quantity extraction rate in each Terai district are more than 12- 14 times. This high rate of extraction will create severe natural disaster in future like floods and landslides in some areas and disappearing ware in rivers

in some other sides. These uncontrolled extractions, which crossed the one billion royalties each year, should stop for the sustainable environment.

Which district is rich in Hydropower?

Nepal is one the richest country in the world based on the potentially of the hydropower. Nepal has rivers that have 1-2 to 10800 megawatts hydroelectricity capacity. Based on many studies, Nepal has a production capacity 80-86 thousands megawatts. However, this analysis has taken 80 thousand megawatts potential for further calculation.

The department of electricity development has issued license for 39,315 megawatts to 421 institutions/individuals based on the data taken on December, 2008 (The current 800 megawatts running project are also in this list).

The tax/royalties are calculated based on these assumptions.

- The capacity of total hydroelectricity production is taken as 80 thousands megawatts based on the applied applications.
- The age of the hydropower projects are taken as 50 years.
- The duration of the return on capital is taken as 20 years.
- The interest on the investment is taken as 10 percent.
- The royalty income is distributed for that hydropower that touched more than two districts are as follows: 50 percentages to the district which has powerhouse and remaining 50 percentages will be distributed to remaining districts for more than 100 megawatts capacity. If the capacity is less than 100 percentage then it will kept the district which has the powerhouse.
- Since the tax and royalty is zero for the first five year, the tax income calculation is done in an average assumption of 25 percentages for whole 50 years.
- Based on this assumption, state will get income of NRs. 38.8 million from royalty and tax per megawatts annually.
- The licenses applied for hydropower production are 39,315 megawatts however; the calculation is done based on the 80,000 megawatts potential capacity developing a coefficient.
- The capital expenditure has a range of NRs. 120 to 360 million per megawatts in the past. In this analysis I have taken as average to NRs. 175 million per megawatts.
- The unit rate of purchase of electricity is different in rainy and dry season. I have taken an average of above to NRs. 5.4 per unit.
- The management cost varies from one percent in private sector to 13 percent in Government Company. I, after discussion with the concerned engineers, have taken as two percent.

Table 3 (Income from tax/royalty in each District)

Table 4 (Maximum hydropower capacity in each District)

Based on the above assumptions, Kailali district is the richest on the hydropower income NRs. 388.8 million followed by Sankhuwasabha 270 million, Jajarkot 227.2 million, Doti 182.6 million, Surkhet/bardia 130 million, Sunsari 118.8 million, Humla 106.6 million, Solukhumbu 100 million and others. Please refer to table 3.

Some Terai districts such as Kailali, Saptari, and Sunsari districts have highest hydropower capacity as the major rivers are running through their border line and the proposed powerhouse, in the applied applications, lies in these districts. And because of this the 50 percentage coefficient is applied on the analysis which makes these districts rich.