

Prospects of Precious and Semiprecious stones in Nepal Himalaya and their Mining Opportunities

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Prospects of precious and semiprecious stone from different parts of the Higher Himalayas and Crystalline Klippe/ Nappe in the Lesser Himalayas in Nepal are known since more than six decade. Few, very small scale quarries are also in operation since that time. Almost all of them are mined applying crude methods without any technical knowhow. As a result more than 75% of the valuable resources are destroyed and wasted during blasting for mining and applying crude mining methods to separate them from the host rocks.

This paper epitomizes these prospects by studying existing prospects/ mines all across Nepal while referencing existing literatures, documents and findings. Among the well known precious stones from Nepal Himalaya are ruby, sapphire and topaz. Similarly among the semiprecious stones constitute various coloured tourmaline, aquamarine, amazonite, gahnite, danburite, kyanite, garnet, epidote, amethyst, citrine, smoky quartz, agate, jasper and colourless transparent rock crystals (Kaphle, 2011). Some of the mines of these stones are closed, few are operational and others are in development stage.

Among the precious stones gem quality small crystals of light red to red ruby and light to dark blue sapphire exist in Chumar and Ruyil villages in the northern remote part of Dhadhing district and in Shelghar, Songlahas, Pola and Sublay in Rasuwa district. They occur in highly tectonized intensely folded en-chelon lenses of saccharoidal dolomite within the high grade metamorphic rocks in MCT zone (Smith et. al., 1997, Basset, 1987). Some corundum, sapphire, and green and straw yellow topaz are also known from Ilam, Taplejung and Rasuwa districts respectively.

Gem quality distinctive multihued tourmaline (Elbaite) and pink, bright green, light orange sometimes with repeated colour banding olive green with amber coloured core tourmaline from Hyakule and Phakuwa are mined from the complex pegmatites in Sankhuwasabha, eastern Nepal are known since 1934 (UN/ESCAP with DMG, 1993). Pegmatites of Ikabu and Lodantar (Taplejung), few places in Panchthar, Langtang valley (Rasuwa), Naje (Manang), Garkhakot (Jajarkot) are also promising for tourmaline. Similarly aquamarine and quartz crystals from Ikabu and Lodantar and hambergite, danburite and ijolite are the important prospects in Taplejung. Aquamarine from Phakuwa (Sankhuwasabha); aquamarine and green coloured tourmaline from Naje (Manang), Lekhpatan and Tikachaur (Jajarkot); Jagat, Panchmane and Kagtigaon (Kathmandu); Baguwa, Tarkeghyang, Nibuwagaon (Sindhupalchok); Khaptad (Bajhang), and few places of Darchula and Panchthar are the other promising sites for aquamarine/ beryl.

Light green amazonite from pegmatites in Hyakule, Phakuwa, Naje and some parts of Taplejung are not minable deposits. Yellowish green to pistachio-green transparent crystals of epidote are recorded in epidote garnet schist, epidote bearing amphibolites and gneiss in Manang. However, there is no epidote mine as such. Gem quality inky blue kyanites are known from Dolakha, Sankhuwasabha, Taplejung, Rasuwa, Dhadhing, Bajhang, Jajarkot, and Achham districts. Kyanite mines are in operation in Daha and Suneri area in Jajarkot in Mid western and Barah area of Achham district in Farwestern Nepal. Garnet is another important gemstone which is widely found mainly in the Higher Himalayan region in Sankhuwasabha, Taplejung, Ilam, Dhadhing, Rasuwa, Jajarkot and few other districts. Deep red and red coloured almandine, hessonite and pyrope garnet are mined from Sankhuwasabha and Taplejung. Quartz crystals are known from pegmatite located in different parts of Taplejung, Ilam, Sankhuwasabha, Nuwakot, Dhadhing, Rashuwa, Manang, Dailekh, Jajarkot and Darchula districts. Smokey quartz crystals, amethyst, citrine, and rock crystals of gem quality are also available in different parts of Nepal. At present

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only two small scale mines are in operation in Khejemi/ Sirku (Taplejung) and Raluka (Nuwakot). Some crypto crystalline red coloured jaspers are recorded in heavy mineral concentrate samples from major rivers but no mineable deposit is traced so far. Agate with attractive alternating layers of chalcedony and opal are present in few places in Sankhuwasabha and Taplejung districts. Most of these prospects are yet to be mined commercially because of lack of infrastructures, technical knowhow, less attractive government policy and contradiction in existing Mining Act, Local Governance Act and Forest Act. Modern faceting gems cutting and polishing machine was introduced in 1985, and a few lapidary works and gem shops were opened in Kathmandu. At present more than six such gem cutting and polishing industries are operational while a number of gem shops are running their business in various major cities. According to the record of DMG, 37 prospecting licenses and 8 mining licenses for different types of gemstones were issued in the Fiscal Year 2009/2010. Few small scale gem stone mines are in operation in Dailekh, Jajarkot, Manang, Dhadhing, Nuwakot, Sindhupalchok, Sankhuwasabha and Taplejung districts but their actual production figures are not known. More than 50% precious and semiprecious raw stones and cut and polished gemstones are imported by Nepal mainly from Burma, Thailand, Hong Kong, Indonesia, Sri-Lanka, Pakistan, India and Russia. The Himalayan gems are very famous and on demand in the international market which make the gemstone prospects very attractive.

There is high opportunity to explore and exploit these stones in Nepal and it demands detail investigations that are yet to be carried out, especially, in the Higher Himalayan region. Therefore, it is recommended to conduct detail exploration and technical evaluation of such prospects prior to mining. By introducing advance mining methods and suitable technology in conjunction with the expert's technical advice there are tremendous opportunities to exploit such deposits in the Higher Himalaya. These well crystallized, attractive fancy coloured, precious and semiprecious stones can be cut and polished as gemstones. Completion of under construction East – West Mid Highway and North – South Highways which pass through the Lesser Himalayan and Higher Himalayan mountain region will facilitate detail investigations in virgin areas and proper mining of known deposits. Mining of these natural resources will not only help to develop infrastructures in remote areas and upgrade the living standard of the local people but also contribute to Nepal's National GDP.

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