



## **Proterozoic Himachal Pradesh Slate: A Heritage Stone from India**

Gurmeet Kaur (1), Victor Cardenes (2), Om Bhargava (1), Uday Sharma (1), Som Nath Thakur (3), Jeesu Jaskanwar Singh (4), Sanchit Garg (1), Amritpaul Singh (1), Asifa Kamboj (1), and Parminder Kaur (1)

(1) Panjab University, Geology, Chandigarh, India (gurmeet28374@gmail.com), (2) Department of Geology, University of Oviedo, Oviedo, Spain, (3) Department of Geography, Panjab University, Chandigarh 160014, India, (4) University School of Open Learning, Panjab University, Chandigarh 160014, India

The Heritage Stone Subcommittee (HSS) under the aegis of International Commission of Geoheritage (ICG-IUGS) accords the status of 'Global Heritage Stone Resource' to those stones which have been utilized in the architectonic heritage with reference to local cultures and traditions (<http://globalheritagestone.com/>). Proterozoic Himachal Pradesh "Slate" has been used extensively in the architectonic heritage of the Himalayan region of India. The deposits, occurring in Chamba, Kangra, Mandi, Kullu, Shimla, Sirmour, Kinnuar and Solan districts of Himachal Pradesh, have been quarried as building material since time immemorial and utilized for roofing and flooring in prominent architectonic heritage: Townhall building, Gaiety Theatre and Bandstand (Shimla), Sarahan Palace and Bhimakali Temple (Sarahan), Praragpur heritage village, temples of Champavati and Lakshmi Narayan (Chamba), to name a few. The crudely foliated varieties have been used locally as masonry in the traditional Kath-Khuni architecture (cator-and-cribbage building using stone and local wood).

'Roofing slate' is a commercial term which includes rocks such as slates, phyllites, schists and shales which can split into thin sheets along fissile planes (Cardenes et al., 2016). The commercial quality of "Slate" of Chamba and Kangra districts belong mainly to the Chamba Formation, some to the underlying Khokhan (Kulu Group) and the overlying Katarigali Formations. Petrographically these comprise quartz, illite and muscovite. The quartz grains are recrystallized with longer axis aligned parallel to the foliation. It is an anchi- to low grade, fine-grained metamorphic rock with well-developed cleavage. A true phyllite includes phyllosilicates, while the slate besides fissility be so fine-grained that no mineral is visible to naked eyes. The Chamba and Kangra "Slate" lack phyllosilicates in which some muscovite can be seen. It is a rock transitional from slate to phyllite, thus, we petrographically identify it as phyllitic slate. These are locally known and traded as Himachal Slates. The "Slates" are grey to greyish black and unlike typical slates have bedding parallel to the cleavage-a feature known all over the Himalaya.

The best quality roofing slates of Himachal Pradesh are from Khaniyara (Chamba district), where formal quarrying commenced in 1850 and continues to date. The slates from Himachal Pradesh are utilized for roofing, fencing, flooring and flagging. In foreign markets, the finest quality Chamba and Kangra slates are used for roofing, flooring and cladding. In view of widespread use of Himachal Slates in the architectonic heritage and contemporary constructions in India and abroad, we propose it as a strong candidate for 'Global Heritage Stone Resource' designation.

### **Selected Bibliography**

Cárdenes, V., Cnudde, J. P., Wichert, J., Large, D., López-Mungira, A., & Cnudde, V. (2016). Roofing slate standards: A critical review. *Construction and Building Materials*, 115, 93-104.