

The Sierra Leone diamond fields cover an area of 7,700 square miles in the south-eastern part of the country, and are centred on the town of Kenema, from which the Alluvial Diamond Mining License is administered. The first diamond was found in 1930, in Kono, and subsequent exploration established that there were extensive alluvial diamond fields in many parts of the region, and an exceptionally rich group of deposits in the Koidu area.

Sierra Leone overlaps the margin of the West Africa craton, and the diamond fields are situated almost entirely on early Pre-Cambrian basement formations within the craton. The principal rock-type is granodiorite gneiss, but this contains inclusions of many metamorphic rocks, notably amphibolites, ultrabasic schists, and granulites. The granitic rocks are cut by several fracture-systems which exercise close control over the drainage pattern, and by numerous narrow dolerite dykes. Topographically, the diamond fields consist of the undulating coastal plains, and the dissected margins of the inland plateau, which are embayed by the broad valleys of the major rivers. Plateau surfaces, occupying subdued topography similar to that of the plains, occur at various elevations between 750 feet and 1,500 feet, and form a step-like sequence. Much of the plateau has, however, been thoroughly dissected, giving rise to rugged hilly country. There are, in addition, three outstanding ranges of steep forested hills which mark the position of major schist belts within the granite. Drainage density averages four miles of permanent drainage channel per square mile, but the first and second order channels are usually swamps, which in fact constitute 80% of the dense network. All rivers have a stepped profile, with rock-bars every two to three miles; mean gradients of less than 4 feet per mile are uncommon, and the major rivers are rarely able to form a wide flood-plain.

Alluvial diamond concentrations occur in river channel gravels, flood-plain gravels, terrace and residual gravels and in swamps. Values in these deposits vary over a wide range, but most of the gravels which are mined carry between 0.2 and 1.5 carats/cubic yard. The diamonds are accompanied in the gravels by a wide variety of heavy minerals, the most important of which is corundum. Magnesian ilmenite and pyrope are present in a few deposits, and indicate the proximity of kimberlites.

The distribution of alluvial diamonds reflects not only the distribution of source-rocks, but also past and present drainage routes. The location of these controlling factors has been principally determined by major lines of structural weakness in the granitic basement, which therefore exercise a predominant influence over the diamond distribution. In the Kono and Tongo fields, the deposits are mostly in the flood-plains and low terraces of streams and small rivers. In the Sewa Valley, however, the principal deposits are those in the channel of the Sewa itself, a wide major river with a rocky irregular bed. There are also narrow terrace deposits beside the river, and some deposits are scattered over the valley floor. Groups of stream and terrace deposits occur in many other parts of the south-eastern Sierra Leone, but these are of lesser importance