Hole cleaning is one of the major considerations for both the design and execution of drilling operations. Especially in wells that have a high inclination, for which the fluid velocity is lowest, it may be lower than a critical value, a stationary bed is developed, which may cause several problems, such as a higher probability of stuck pipe getting stuck, high drag, and higher hydraulic requirements. If not removed properly, these problems can be severe. In order to avoid such problems, generated any cuttings generated will have to be taken out.

To efficiently transport cuttings through the wellbore, a drilling fluid is used. Factors that influence the cutting transport include drilling fluid flow rate, drilling fluid viscosity, drilling fluid weight, and the drilling fluid type. A high flow rate is necessary to transport cuttings to the surface of the wellbore frequently.

A lot of cutting transportation models have been developed. Nowadays, it was common to recognize a few main approaches. An empirical approach, and a mechanistic approach were the present study employed three models, developed through an empirical approach; these are the Rudi–Shindu's model [7], Hopkins' model [8], and Tobenna's model [9]. In 1995, Hopkins listed all variables that are involved to determine the minimum flow rate. After several years later, Rudi–Shindu introduced the slip velocity, and correction factors for the drilling fluid weight, and the angular inclination. Tobenna developed a model in 2010 to calculate the critical flow rate for deviated wells based on Bern–Lou's method. The models are compared to case-study wells, two examples being wells that mimicked operational conditions are considered.