Dholuo is a language with a complex morphology. This complexity is evident in its derivational morphology which is characterized by verbal extensions. These extensions are: applicative, locative, reflexive, reciprocal and stative. The five extensions have effects both on morphosyntax and semantics of Dholuo verbs. This study is therefore set out to investigate the morphosyntactic and semantic properties of Dholuo verbal extensions and analyze these properties using Minimalist Program (MP) theory. To achieve these objectives, the researcher compiled a list of one hundred Dholuo verbs using the secondary source, Luo English dictionary. It is from this list that the verbs used in the study were purposively sampled from transitive, intransitive and transitive/intransitive verbs. The researcher employed his own native intuition to generate derived Dholuo verbal constructions using the samples. To confirm the status of the generated structures, the researcher consulted two informants who are native speakers of Dholuo. MP tree diagrams (syntactic and semantic configurations) were then used for the analysis of the data after which the findings were discussed within the MP framework. According to the findings, the five verbal extensions alter morphological shapes of Dholuo verbs by introducing derivational morphemes together with their respective arguments. The attachment of the verbal extensions to Dholuo verbs makes verbs complex. This complexity is also shown in the possible concatenation of the extensions in Dholuo verbal structures. Syntactically, the study reveals that Dholuo verbal extensions have effects on the number of arguments a host verb subcategorizes for: the applicative and the locative extensions increase the number of arguments within a verbal matrix of the host verb; the reflexive and the reciprocal maintain the number of arguments while the stative reduces the number of arguments. From the analysis, this study has found out that respective arguments introduced by these extensions to a verb, just like the subject and the object arguments, are assigned semantic roles determined by the meaning of verbs that host the extensions. The conclusion is that the morphosyntactic and semantic features of Dholuo verbal extensions can be adequately handled within the MP framework. The incorporation of the five Dholuo verbal extensions in a template of a verb, according to the principles of MP, causes the creation of derivational heads where semantic and morphosyntactic features in the extended verb are checked. The study also shows that semantic heads are created to provide sites where arguments introduced by Dholuo verbal extensions to the host verb are assigned their semantic roles through the merger of the head with these arguments.