Below the roughening transition, the surface of an epitaxial film consists of steps whose distribution and motion determine the surface morphology. The elastic effects on the epitaxial surface provide a driving force for the motion of these surface steps. The stress in the epitaxial film, which may be due to the misfit between the lattice constants in the film and in the substrate, generates a long-range elastic effect on the epitaxial surface. We present a continuum model for this long-range elastic effect, incorporating the discrete features of the stepped surface. The model is obtained by taking continuum limit of the discrete model for the elastic interaction between surface steps.