ABSTRACT. In this paper we investigate connections between minimal Lagrangian submanifolds and holomorphic vector fields in Kähler manifolds. Our main result is: Let M^{2n} ($n \geq 2$) be a Kähler-Einstein manifold with positive scalar curvature with an effective, structure-preserving action by an n-torus T^n. Then precisely one regular orbit L of the T^n-action is a minimal Lagrangian submanifold of M. Moreover there is an $(n-1)$-torus $T^{n-1} \subset T^n$ and a sequence of non-flat immersed minimal Lagrangian tori L_k in M such that all L_k are invariant under T^{n-1} and L_k locally converge to L (in particular the supremum of the sectional curvatures of L_k and the distance between L and L_k go to 0 as $k \mapsto \infty$). This result is new even for $M = \mathbb{C}P^n$ for $n \geq 3$.