The lack of recognition of tsunami risk by people in prone areas suffering from a major earthquake, results in a bewildering number of non-evacuees after a natural or technical warning. The purpose of this study was to develop a start time evacuation model based on tsunami risk perception, experience, warning information, social influence and time pressure. The decision process relies on the risk perception level addressed in three stages – Pre-decision, Decision-making and Action. Questionnaire surveys and techniques of Reference Risk, Prospect Reference Theory, Subjective Judgment Matrices and Bayesian Learning were used in order to construct the theoretical framework and to obtain input parameters of human behavior. The risk perception framework proposed here, allowed us to construct a model of start time decision for evacuation in an individual scale. The model was verified with data from a questionnaire survey conducted in La Punta, Peru – a tsunami high risk peninsula. Results have shown an improvement on the predicted decision times compared to cumulative distribution functions assumed in traditional evacuation assessment in the field of emergency planning, giving to the model a promising future. Moreover, this framework holds a great advantage on the individual analysis capability. The risk perception framework presented here, is part of a future integrated model of multi agents in evacuation and tsunami simulation for coastal mitigation purposes.