ABSTRACT

Nam Dok Mai is a major Thai mango cultivar, and it is gaining importance in international trade. Despite the major mango producing country, Thailand has the lowest average export mango production growth rate among other top exporter countries. As the global demand for fresh mango rises, Thailand should be able to meet the demand with the expected supply quantity and quality. The export mango production is very dynamic and contains many risks. Therefore, risk management is needed to assess the existing risks at the plantation. One of the methods that can capture the complexity and its dynamics is the system dynamics. This study is aimed to identify the existing risks within the mango export production, to create a system dynamic model based on the findings, and to simulate the model under different scenarios. This study was conducted at Mango Export Community Enterprise Group Ban Haet District, Khon Kaen Province, Thailand. The risk assessment steps used in this study were taken from ISO 31000:2018. In-depth interview was done to identify risks within mango export production with four samples of mango export grower. The fifth scale of Likert closed questionnaire was designed and distributed later to 14 samples of mango export growers to obtain the probability and severity of the identified risks. The respondents for this study were selected with the convenience sampling technique. The risks were then analyzed using the Risk Assessment Matrix tool to obtain the risk category. Meanwhile, the system dynamic model was created and simulated later using Vensim simulation software. The result showed that there were 19 identified risks with pest attack as the highest risk. The generated scenarios towards the model were Scenario 1 with the optimistic condition and Scenario 2 with the pessimistic condition of the pest attack in the mango export production. The scenarios were simulated for the next 24 months in the 2019-2020 year period. In the Scenario 1, the model simulation showed that the total yield of mango export in 2019 and 2020 increased to 67.6% and doubled from the existing condition, respectively. Whereas in the Scenario 2, it decreased to 72.04% and 81.47% from the existing condition, respectively.

Keywords: Nam Dok Mai mango, mango production, model simulation, risk management, system dynamics