ABSTRACT

In the existing condition, CV XYZ Warehouse has not implemented an inventory policy that is in accordance with the characteristics and needs, this can be seen from several symptoms and impacts. Demand is a variable that cannot be controlled, so CV XYZ Warehouse needs to adjust the replenishment policy to the variability of demand. In 1 year or 51 weeks there are 46 backlogs so that the percentage is 90,20% and the demand that is fulfilled normally is 9,80%. soybean backlog quantity data at CV XYZ Warehouse in 2023. The actual total inventory cost that has been calculated using the classic formula shows an excess percentage of 9,03%, this is due to the shortage costs arising from the lack of demand. So the problem formulation for this research is "how is the proposed inventory policy at CV XYZ Warehouse to minimize the total cost of inventory?"

This model compares two conditions, namely No-VMI and using VMI with the assumption that has been mentioned, VMI can reduce total supply chain costs if the order cost at the supplier is greater than the order cost at the buyer. This model has deterministic demand parameters and the lead time is assumed to be zero so it needs adjustment if it is used in the final project research model. These two policies will be considered for the selection of which policy is the most economical and in accordance with the needs, besides that the purpose of using VMI is to improve coordination between suppliers and buyers. Based on numerical examples of calculations using the two policies reviewed, it can be concluded that the (r, Q) model has a more significant impact in reducing total inventory costs but requires a high level of responsiveness because the (r, Q) model can result in a reduction in the number of backlogged requests.

The parameters used as inputs are demand, actual replenishment or inbound amount, order cost at the buyer, order cost at the supplier, storage cost at the buyer, backlog penalty cost at the buyer, delay time for delivery of goods from supplier to buyer, standard deviation of demand at the buyer, service level, cycle time with (r, Q), safety stock amount, reorder point with (r, Q), optimal backlog amount, optimal message quantity then there is an objective function, namely the total inventory cost without VMI and the total inventory cost with VMI.

The results of the calculations for the backlog quantity in the No-VMI inventory policy are 197,26 kg and 167,83 kg for VMI. The optimal order lot size in the No-VMI inventory policy is 3.298,81 kg and 53.476,81 kg for VMI. The cycle time for No-VMI is 0,25 days and for VMI is 4,07 days. The safety stock for No-VMI is 1.760,78 kg and for VMI is 7.089,41 kg. The replenishment point for No-VMI is 3.952,72 kg and for VMI is 9.281,34 kg. The total inventory cost was successfully minimized from the actual condition to No-VMI by 30,26%, while from actual to VMI by 90,26%, amounting to Rp 1.059.293,94.

The comparison of actual conditions with the two proposed improvement models resulted in the decision that the VMI system is feasible to be implemented in actual conditions. If this inequality is met, the total inventory cost of VMI is smaller than No-VMI, besides that in VMI the supplier will bear its own order costs and make decisions on replenishment so that the supplier will also be willing to switch to the VMI system if the order cost is not too small and does not cause systemic losses.

Keyword: soybean, inventory policy, vendor managed inventory, backlog, continuous review