

CHAPTER VI

CONCLUSION

This chapter contains the conclusion of the research and the recommendation for further research.

6.1 Conclusion

Based on the research results and analyses presented, it can be concluded that the development of the Periodic Vehicle Routing Problem with Multiple Products (PVRPMP) model has successfully provided an optimal solution to the distribution challenges faced by CV Anugrah Semata Wayang 67. This study demonstrates that the use of exact methods (Gurobi Optimizer) is a highly vital instrument in supporting tactical decision-making. Through its mathematical accuracy, management is able to conduct more measurable medium-term logistics planning, such as determining fixed weekly visit schedules, evaluating the most efficient lodging locations, and redesigning more compact distribution zones. On the other hand, the Cuckoo Search Algorithm (CSA) serves as a solution for daily operational levels that require quick responses to field dynamics without significantly compromising route quality.

The implementation of the proposed routes provides substantial efficiency impacts, both physically and financially. In total, the optimized routes achieve a distance saving of 599.36 km per month, reducing the total distance from 2,758.72 km to 2,159.36 km (an efficiency of 27.76%). From an economic feasibility perspective, this annual benefit has been further evaluated using the Benefit-Cost Ratio (BCR) method. The analysis results in a BCR value of 1.767, indicating that the total discounted benefits significantly exceed the associated costs. Since $BCR > 1$, the proposed routing solution is considered economically feasible and justifiable for implementation, as it generates greater value compared to the investment required.

One of the most impactful tactical outcomes is the restructuring of working days in the Padang area from 6 days to 5 days. This change provides a strategic advantage in the form of opportunity gain, where the company now has the flexibility to allocate resources on the sixth day for market expansion activities, new customer acquisition, and preventive fleet maintenance programs.

6.2 Suggestion

Suggestions that can be given for future research are as follows:

1. Future studies should consider incorporating dynamic factors such as real-time traffic conditions and uncertain customer demand to improve the model's applicability in real-world situations.
2. Further research can explore the use of heterogeneous fleets with different vehicle capacities to enhance resource allocation efficiency.
3. Future research can be conducted using other optimization software or tools to obtain a global optimal solution with significantly faster computation time.
4. Future studies are also encouraged to explore and compare various distribution systems beyond canvassing in order to identify more efficient and adaptive approaches that better suit the company's operational conditions.

