# CHAPTER 6 CONCLUSIONS AND RECOMENDATIONS

## 6.1 Conclusions

Based on a series of analysis explained in the previous chapter then some important points can be concluded as follow:

1. Optimization of existing multi-year Djuanda Reservoir operation since 2003-2005 using multi objective approach performs better results. It is indicated that objective functions and constraints could be achieved satisfactorily compared to realization of multi-year Djuanda Reservoir operation.
2. Specifically in Djuanda Reservoir operation of 2010 (flood event), after optimization then it indicates that spillage of reservoir could be reduced by 100 % or zero spill besides fulfillment of downstream needs becomes 243.51 %. Annual squared deviation between release and demand performs to the better value of 112,317.43 $(Mm^3)^2$ and annual flood storage availability becomes 130,529.57 $Mm^3$ or increase 84,548.74 $Mm^3$ compared to the existing one.
3. Optimization to Djuanda Reservoir Operation Plan 2016 indicates that all objective functions and constraints deliver satisfactory conditions. Trade-off curves provide value of objective parameters better than existing one. This optimized operation model could be considered as the best compromised solution.

4. Based on optimized operation model, simulation to Djuanda Reservoir operation by increasing water demand indicates that optimized operation model could not deliver satisfactory condition to the maximum water demand increment of 10 $m^3/s$. Hence, re-optimization in the upper rule curve and the lower rule curve is needed in order to meet all water demand satisfactorily.

## 6.2 Recommendations

Based on this research some of recommendations could be considered as follow:

1. Besides current reservoir operation model, optimized reservoir operation model in this research might be considered as an alternative operation based on decided objective functions.
2. This optimized reservoir operation model could be improved by involving energy productivity in the objective functions and involving 3 (three) cascade reservoirs i.e. Saguling, Cirata and Djuanda Reservoir in the Citarum River Basin.
3. Optimized daily reservoir operation model could be developed by utilizing real time meteorological data and rainfall-runoff model in order to forecast inflow data.
4. In order to perfect this reservoir optimization, further research by updating Storage-Elevation Curve of Djuanda Reservoir is highly recommended.

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