V. CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Based on the result of study about SWAT and GIS application to address impact of landuse change on water availability and optimizing landuse in Upper Cimanuk Catchment Area, the general conclusions has been formulated. The population growth and economic development in Upper Cimanuk Catchment Area had an impact on landuse change and also on water availability. Optimizing landuse is aimed to find the best landuse composition that has minimal impact to hydrology condition. The general conclusions are as follows;

- During 1991-2005 most of the landuse change is caused by settlement area, mainly urban and sub-urban areas. The changes to settlement areas or urban growth usually occurred from conversion of agriculture, bare land, or grassland areas. Forest areas are converted to agriculture at steep slope area, mainly mountainous area. Mostly the landuse change is converting from good condition to poor condition from hydrology point of aspect.
- The SWAT Model can be used to find impact of landuse change to hydrology condition. The simulation of each landuse data series showed impact on landuse change on hydrology characteristics. The landuse change from 1991 to 2002 has indeed increased the surface runoff, while reforestation during 2002-2005 has decreased the surface runoff and increased base flow.
- The SWAT model is also capable for optimizing landuse in Upper Cimanuk Catchment Area, and the process resulted to Scenario 2 (elevation >1500 change to forest area) have a good landuse class composition for watershed management compared to other scenarios. The scenario 2 also better than Landuse Planning (RTRW) and existing landuse condition.

5.2 Recommendations

Modeling study depends on input data, some improvements of input and process need to be accomplished in order to achieve better result, especially by using finer resolution of data (spatial and temporal). Besides that, the landuse
database used crop and urban of sub-tropical region, so that, the development of tropical crops and urban database is needed for Indonesian condition.

SWAT model is capable to be used for landuse planning; the simulation model can be used for assessment of landuse allocation. The composition of landuse planning can simulate and test impact to hydrology condition. In this study, the scenario is developed by query on GIS application and this not so easy for the user who does not capability in GIS. Development of landuse scenario application is needed for local government. The application can be used for Decision Support System (DSS) in Landuse Planning using hydrology condition as assessment.