The effect of biodiesel utilization in the transportation sector with respect to pollutant emission and external cost of environmental quality and health improvement has been analyzed. The MLuS air quality model employed in the analysis results the following conclusions in two aspects, improvement in the pollutant emission and external cost accounting.

The first aspect in the conclusions is that biodiesel fuel mixed in various blending ratio with mineral diesel oil greatly reduces the amount of pollutant emitted from diesel engine used in the transportation sector. This implies that such a program of introducing biodiesel in Jakarta could potentially improve its air quality level. Such an improvement however, would depend on the choice of blending ratio because the amount of pollutant emitted from the diesel engines declines rapidly in the early percentage of blending ratio but stays flat as the biodiesel blending composition is raised. Performing simulation on higher blending scenarios such as B50 and B100 has proved the case.

Thus, taking into account technical and economical point of views, the results obtained from model have suggested that B20 is the optimum blending ratio suitable for unmodified diesel engine. The utilizations of B20 in 2025 compared to the non-biodiesel case (base case) may potentially reduce 10.8 thousand ton SO$_2$, 2.9 thousand ton NO$_x$, 17.2 thousand ton HC, 2.8 thousand ton PM and 23.5 thousand ton CO.

The second aspect in the conclusions is that external cost analysis in relation to environmental quality and health improvement affected by biodiesel utilization in transportation sector in Jakarta has been identified using the model simulation. The utilizations of B10 and B20 in 2010 compared to the non-biodiesel (base) case may reduce total external cost by 13.4 and 59.0 billion rupiah and they increase by 25.2 and 105.7 billion rupiah in 2025. The external cost reduction may achieve its maximum value of 447.7 billion rupiah when B100 is introduced in 2025.
The results also confirm that biodiesel in the blended fuel has contributed significantly in reducing SO₂ emission. Compared to the non-biodiesel case (high emission coefficient case), a reduction of 10.63% in external cost attributed to SO₂ pollutant could be realized if B20 utilization is implemented in 2025. Such a figure may rise by 75.85% when B100 is introduced.

The total associated external cost value evaluation however shows that SO₂ is not the major contributor to the external cost. In contrast, the results have revealed that PM is the highest external cost contributor (78.97%). The second rank is CO emission (14.96%) and followed by HC (2.54%), NOₓ (3.27%) and SO₂ (0.44%). The surprisingly low external cost contribution from SO₂ emission is due to smaller number of health impact cases, dose response and health cost of SO₂ compared to other pollutants.

The simulation results also suggest that the simples way to internalize the externality of biodiesel utilization is by adding the estimated external value to the product price to be paid directly by the polluter. Taking into account the diesel fuel consumption for the transportation sector in 2010 and 2025, the reduction translates into external cost of Rp. 4 to 18 per liter for B10 and B20 respectively. Moreover, provided such a diesel engine fueled by B100 is available, the external cost reduction could reach up to Rp. 90 per liter.

Implementations for such a polluter pay principle can be realized in several ways. The first option is to raise the price of pure diesel fuel to cover the external cost as an impact of biodiesel utilization. The second option is reducing added value tax on fuel (PPN-BBM) which currently stays at 5%. The third option might be achieved by raising the tax on cars (Pajak Kendaraan Bermotor-PKB). Among those options, the best option is imposing tax on cars running on diesel engine because the Indonesian government policy of marketing biodiesel is having biodiesel in the form of blending with diesel oil.