

S3 File. Population Offset

Population data for study location is obtained from the Central Bureau of Statistics, Yogyakarta Province¹. The annual population growth rate in Yogyakarta Municipality is below 1% during 1990-2010, thus the population was relatively stationary during the study period.

S3 File_Table 1. Population Growth Rate per Year in Yogyakarta Municipality

Census	Pop	Growth Rate/year
1961	306296	NA
1971	340491	0,0106
1980	398089	0,0174
1990	412059	0,0034
2000	396711	-0,0038
2010	388627	-0,0021

The Table below illustrate that adding population as offset in this case study does not change much due to the stable population in the study period.

S3 File_Table 2. Predictive Performance Statistics, without and with offset

Offset contribution	R-sq.(adj)	AIC	Training Dataset		External Dataset	
			RMSE	SRMSE	RMSE	SRMSE
Model D	0.636	2311.60	32.448	0.403	39.491	0.613
Model D + offset	0.636	2315.32	32.476	0.404	38.966	0.605

¹ Badan Pusat Statistik (BPS) Provinsi Daerah Istimewa Yogyakarta. **Penduduk Provinsi Daerah Istimewa Yogyakarta Hasil Sensus Penduduk 1961-2010** [Internet]. Yogyakarta: Badan Pusat Statistik (BPS) Provinsi Daerah Istimewa Yogyakarta; 2013 [cited 2015 Dec 10]. Available from: http://yogyakarta.bps.go.id/website/pdf_publicasi/Penduduk-Provinsi-Daerah-Istimewa-Yogyakarta-Hasil-Sensus-Penduduk-1961-2010.pdf. Indonesian.