学　位　論　文　内　容　の　要　旨
Abstract of Doctoral Dissertation

博士の専攻分野の名称　博士（理 学）　　氏　名　エムディ モタレブ ホサイン
Degree requested　Doctor of Science　　Applicant's name: Md. Motaleb Hossain

学　位　論　文　題　名
Title of Doctoral Dissertation

Sediment-Loading Processes in a Forested Catchment Influenced by Slope Failure

（斜面崩壊を伴う森林流域の土砂流出機構）

The "slope failure" in the title means the surface failure and deep landslide on catchment slope and the bank collapse in riparian regions, which occur under rainfall, snowmelt or earthquake. Dynamic processes of landslide on catchment slope have been investigated by many geologists, geomorphologists and geophysists, but studies on subsequent fluvial sedimentation processes, connected to sediment load of river, are very few in the world. My study area, the Oikamanai River catchment, eastern Hokkaido, is forested (ca. 90% area), but accompanied by two tephra layers (Tarumae Ta-b in 1667 and Shikotsu Spfa-1, ca. 40,000 year ago) in forest soils and the Neogene sedimentary rocks with active faults, which tend to frequently produce surface failure and deep landslide, respectively, under rainfall or snowmelt. In order to understand and predict such disastrous phenomena and subsequent fluvial sedimentation in the catchment, I monitored water level and water turbidity of river in the Oikamanai River catchment in rainfall seasons of 2011 – 2014, and modeled observed discharge and sediment load time series. The monitoring of water turbidity and river stage was performed at two sites along the river, and thereby, I distinguished rainfall runoff events with slope failure from those without slope failure, and identified the seasonal sediment source in the upper catchment, since there occurred more sediment runoff events with higher sediment yield. The monitoring at the two sites also revealed that the net sediment deposition occurs between the two sites. A semi-distributed model, ArcSWAT2012, and a lumped model, the tank model, coupled with power function, were applied to simulate discharge and sediment load time series, obtained in 2011 to 2014. In ArcSWAT2012, the total basin area (62.47 km^2) was divided into three sub-basins (sub-basin 1, sub-basin 2, sub-basin 3), as sub-basins into hydrological response unit (HRU) based on soil type, land use and slope classes that allow a high level of spatial detail simulation. For modelling I used the daily data of discharge, suspended sediment concentration and sediment load for non-frozen periods (April to November) of 2011 - 2014, weather data of 2008 - 2014, and soil data. Soil water content and water storage in soil could change every year, because the snowmelt amount is different year by year. So I have utilized my models at annual base. As a result, both SWAT and the tank model plus power function reasonably simulated the daily mean discharge and sediment load time series. The simulations indicate that most of sediment input originates in the western subbasin 2, and that the sediment load by surface flow and that by river flow are comparable in magnitude. As a next step, I will challenge to clarify discharging and sediment-eroding processes on and below the catchment slope (slope hydrology and sedimentology), in order to more understand the sediment loading processes on catchment scale.