

Environmental, Economic and Social Impact Assessment of Reducing Japanese Food Loss and Waste

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[Abstract]

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In Japan, the Act on Promotion of Food Loss and Waste Reduction was enacted in 2019, and the government set a goal to halve food loss and waste by 2030 compared to the 2000 level. However, there are few quantitative findings regarding the impacts of food loss and waste on the environment, economy and society, and detailed information is necessary to effectively implement reduction measures. Therefore, in this study, we conducted the following three analyses on the effects. First, the impacts of Japanese food loss and waste on greenhouse gas emissions, natural resource utilization, and the economic value of food were estimated using the life cycle assessment method for 2015. Consequently, the total Japanese food loss and waste was estimated at 6.46 million tons in 2015, and the total greenhouse gas emissions resulting from food loss and waste were estimated at 15.66 million tons of CO₂ eq. In addition, 1.11 million hectares of harvested land and 439 million m³ of water resources were used to produce food that was eventually wasted, and the economic value of lost food was estimated at 4,587 billion yen. Second, the impacts of halving Japanese food loss and waste by 2030 on domestic food-related goods and service production, real gross domestic product (GDP), and greenhouse gas emissions were estimated using a general equilibrium (CGE) model based on three food consumption scenarios considering the COVID-19 pandemic. As a result, while food-related goods and service production will decrease by 677 billion yen to 948 billion yen in 2030, real GDP will increase by 83.7 billion yen to 83.9 billion yen, and greenhouse gas emissions will increase by 490 thousand tons of CO₂ eq. to 710 thousand tons of CO₂ eq. Third, given the global economic situation in 2015, the impacts of halving Japanese food loss and waste on the number of undernourished people, greenhouse gas emissions, and natural resource utilization during agricultural production were estimated using a food trade model. Consequently, by reducing 750 thousand tons of food loss and waste related to major food trade items, the number of undernourished people worldwide was estimated to be decreased by 590 thousand, and greenhouse gas emissions were estimated to be reduced by 940 thousand tons CO₂ eq. In addition, 37.8 thousand hectares of harvested land and 78.7 million m³ of water resources were estimated to be reduced globally.