Water Demand Management and Adaptation to Climate Variability for the Pro-Growth Taiwan Economy

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Taiwan is ranked 18th among all countries in terms of water scarcity. It is almost not possible to build extra reservoirs due to the unfavorable geological conditions and increasing protests by environmentalists. Given such water storage constraints, further hydrological pressure imposed by climate changeâ€”as the IPCC Fifth Assessment Report and research by local scientists predict of more intensified precipitation and variations between wet/dry seasonsâ€”policies focusing on water demand management would be imperative for Taiwan to adapt to future hydrological change and the increasing competition for water between water users in its course of economic development. The prevailing water price in Taiwan is relatively low as compared with other countries. The increasingly water-intensive industry structureâ€”e.g., electronics and petrochemical industries, which are also the biggest GDP contributorsâ€”is pushing up water demand in Taiwan. Over the past decade, competition for water resources between agriculture and industrial sectors intensified particularly in the wake of climate-induced disruption of fresh water supply. More intense competition for water resources is foreseeable with the looming climate change. Reflecting such water constraints and competition for water resources between economic agents, we built a computable general equilibrium (CGE) modelâ€”which describes sectoral water demand and cost-efficiency interaction, under the exogenously given water supplyâ€”to investigate the economy-wide impact of coping strategies, such as raising water price, for Taiwan under potential water supply stress as imposed by climate variability. Our results indicate that raising the currently very low water price to commensurate with the average cost of water supply would cause only minor impact on the economic growth, particularly the key sectors of the economy. This suggests that raising water price will be desirable to attain water efficiency and get water users prepared ahead of time to brace for and to adapt to likely water stress under looming climate variability.