EIGHTEENTH CONGRESS OF THE)
REPUBLIC OF THE PHILIPPINES)
First Regular Session)

Senate
Office of the Secretary

'19 JUL -2 P6:16

SENATE
S. No. 216

RECEIVED

Introduced by Senator Francis "Tol" N. Tolentino

AN ACT
COMMISSIONING A RESEARCH ON CLIMATE CHANGE DRINKING WATER ADAPTATION

EXPLANATORY NOTE

Climate change is evidently affecting humanity in various ways such as rising sea levels, warming temperatures, intensifying heat waves and other effects that scientists had predicted in the past. Climate experts and scientists have agreed that this period of warming is occurring rapidly over time, and it will bring long-term devastating effects to humanity if nothing is done.

Change is underway even for the world's water cycle and supply as there will be increased precipitation and declining water quality, according to the Union of Concerned Scientists. This concerns many sectors including health, energy production, agriculture and ecosystem, among others. Even water utilities in Asia, Europe, Australia and the United States already anticipate that climate change will compel them to turn into alternative ways as supplying water is energy intensive.

It is undeniable that the Philippines already feels the inconvenience of water shortage crisis. As a matter of fact, the Japan International Cooperation Agency, in cooperation with our National Water Resources Board, has foreseen a national water crisis in which all major Philippine cities will be experiencing water shortages by 2025. It is high time that there be a water research commission to further study and assess

the climate change effects on the local drinking water industry and develop a set of comprehensive adaptive strategies. Hence, this bill proposes the commissioning of an intensive research body on this area.

This bill is inspired by the response of the US drinking water industry in the impending and worsening water shortage by sponsoring a non-profit water research foundation which conducts partnership research projects with its European and Asian counterparts to develop a unified program on strategies to combat and address the impacts of climate change.

Water is life and access to safe and clean drinking water is a basic human right that must always be protected. In view of the foregoing, the passage of this bill is earnestly sought.[1]

FRANCIS "TOL" N. TOLENTINO
Senator

[1] This was lifted from a bill filed by the late Senator Miriam Defensor Santiago during the Fourteenth Congress, First Regular Session; refiled during the Sixteenth Congress, Third Regular Session; and is now refiled during the Eighteenth Congress in her honor.

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Be it enacted by the Senate and House of Representatives of the Philippines in Congress assembled:

Section 1. *In General.* – The Department of Science and Technology (DOST), in cooperation with the Department of Environment and Natural Resources (DENR), shall establish and provide funding for a program of directed and applied research which will be conducted through a non-profit water research foundation. It will be sponsored by drinking water utilities to assist suppliers of drinking water in adapting to the effects of climate change.

Sec. 2. *Research Areas.* – All research conducted in accordance with this Act shall include studies into:

1. Water quality impacts and solutions, including studies:
    a. To address probable impacts on raw water quality resulting from:
        i. Erosion and turbidity from extreme precipitation events;
        ii. Watershed vegetation changes;
        iii. Increasing ranges of pathogens, algae, and nuisance organisms resulting from warmer temperatures; and

b. On mitigating increasing damage to watersheds and water quality by evaluating extreme events, such as wildfires and hurricanes. To learn and develop management approaches to mitigate:
    i. Permanent watershed damage;
    ii. Quality and yield impacts on source waters; and
    iii. Increased costs of water treatment;

2. Impacts on groundwater supplies from carbon sequestration, including research to evaluate potential water quality consequences of carbon sequestration in various regional aquifers, soil conditions, and mineral deposits;
3. Water quantity impacts and solutions, including research:
    a. To evaluate climate change impacts on water resources throughout hydrological basins of the Philippines;
    b. To improve the accuracy and resolution of climate change models at a regional level;
    c. To identify and explore options for increasing conjunctive use of aboveground and underground storage of water; and
    d. To optimize operation of existing and new reservoirs in diminished and erratic periods of precipitation and runoff;
4. Infrastructure impacts and solutions for water treatment facilities and underground pipelines, including research:
    a. To evaluate and mitigate the impacts of sea level rise on:
        i. near-shore facilities;
        ii. soil drying and subsidence;
        iii. reduced flows in water and wastewater pipelines; and
    b. On ways of increasing the resilience of existing infrastructure and development of new design standard for future infrastructure;
5. Desalination, water reuse, and alternative supply technologies including research:
    a. To improve and optimize existing membrane technologies, and to identify and develop breakthrough technologies, to enable the use of

seawater, brackish groundwater, treated wastewater, and other impaired sources;

b. Into new sources of water through more cost-effective water treatment practices in recycling and desalination; and

c. To improve technologies for use in:

i. Managing and minimizing the volume of desalination and reuse concentrate streams; and

ii. Minimizing the environmental impacts of seawater intake at desalination facilities;

6. Energy efficiency and greenhouse gas minimization, including research:

a. On optimizing the energy efficiency of water supply and improving water efficiency in energy production; and

b. To identify and develop renewable, carbon-neutral energy options for the water supply industry;

7. Regional and hydrological basin cooperative water management solutions, including research into:

a. Institutional mechanisms for greater regional cooperation and use of water exchanges, banking and transfers; and

b. The economic benefits of sharing risks of shortage across wider areas;

8. Utility management, decision support systems, and water management models, including research:

a. Into improved decision support systems and modeling tools for use by water utility managers to assist with increased water supply uncertainty and adaptation strategies posed by climate change;

b. To provide financial tools, including new rate structures, to manage financial resources and investments, because increased conservation practices may diminish revenue and increase investments in infrastructure; and

c. To develop improved systems and models for use in evaluating:

i. Successful alternative methods for conservation and demand management; and

ii. Climate change impacts on groundwater resources;

9. Reducing greenhouse gas emissions and energy demand management, including research to improve energy efficiency in water collection, production, transmission, treatment, distribution, and disposal to provide more sustainability and means to assist drinking water utilities in reducing the production of greenhouse gas emissions in the collection production, transmission, treatment, distribution, and disposal of drinking water;
10. Water conservation and demand management, including research:
    a. To develop strategic approaches to water demand management that offer the lowest cost, non-infrastructural options to serve growing populations or manage declining supplies, primarily through:
        i. Efficiencies in water use and reallocation of the saved water;
        ii. Demand management tools;
        iii. Economic incentives; and
        iv. Water-saving technologies; and
    b. Into efficiencies in water management through integrated water resource management that incorporates:
        i. Supply-side and demand-side processes;
        ii. Continuous adaptive management; and
        iii. The inclusion of stakeholders in decision-making processes; and
11. Communications, education, and public acceptance, including research:
    a. Into improved strategies and approaches for communicating with customers, decision makers, and other stakeholders about the implications of climate change on water supply; and
    b. To develop effective communication approaches to gain:
        i. Public acceptance of alternative water supplies and new policies and practices, including conservation and demand management; and
        ii. Public recognition and acceptance of increased costs.

Sec. 3. *Annual Reports.* – The DOST shall submit reports on compliance with this Act to the appropriate committees in the Senate and the House of Representatives annually for the first two years after the date of effectivity of this Act and once every three years thereafter.

Sec. 4. *Appropriations.* – The amount necessary for the initial implementation of this Act shall be charged against the appropriations of the DOST under the current General Appropriations Act. Thereafter, such sum as may be necessary for its full implementation shall be included in the annual General Appropriations Act as a distinct and separate item.

Sec. 5. *Separability Clause.* – If any provision of this Act is held invalid or unconstitutional, the same shall not affect the validity and effectivity of the other provisions thereof.

Sec. 6. *Repealing Clause.* – Any law, presidential decree or issuance, executive order, letter of instruction, administrative order, rule or regulation contrary to or is inconsistent with the provision of this Act is hereby repealed, modified, or amended accordingly.

Sec. 7. *Effectivity.* – This Act shall take effect fifteen (15) days after its publication in the Official Gazette or in two (2) newspapers of general circulation.

Approved,