SIXTEENTH CONGRESS OF THE REPUBLIC)
OF THE PHILIPPINES)
Third Regular Session)

Senate
Office of the Secretary

'16 JAN 26 P2:52

SENATE
S. No. 3133

RECEIVED BY:

Introduced by Senator Miriam Defensor Santiago

AN ACT
COMMISSIONING A RESEARCH ON CLIMATE CHANGE DRINKING WATER ADAPTATION

EXPLANATORY NOTE

The consensus among climate scientists is overwhelming that climate change is occurring more rapidly than can be attributed to natural causes and that significant impact to the water supply are already occurring, Among the first and most critical of those impacts will be change to patterns of precipitation around the world, which will affect water availability. Drinking water utilities throughout the United States, as well as those in Europe, Australia and Asia, are concerned that extended changes in precipitation will lead to extended droughts. Supplying water is highly energy-intensive and will become more so as climate change forces more utilities to turn to alternative supplies.

Since 2003, the drinking water industry of the United States has sponsored, through a non-profit water research foundation, various studies to assess the impacts of climate change on drinking water supplies, Those studies demonstrate the need for a comprehensive program of research into the full range of impacts on drinking water utilities, including impacts on water supplies, facilities, and customers. The non-profit water research foundation is also coordinating internationally with other drinking water utilities on shared research projects with counterpart European and Asian water research organizations to develop a unified research agenda for applied research on adaptive strategies to address climate change impacts.

There is a need then to form a local counterpart body to take advantage of this global network of knowledge to prevent a water crisis.[1]

MIRIAM DEFENSOR SANTIAGO

[1] This bill was originally filed during the Fourteenth Congress, First Regular Session.

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

SECTION 1. *In General* - The Department of Environment and Natural Resources, in cooperation with the Department of Trade and Industry, and the Department of Energy, shall establish and provide funding for a program of directed and applied research, to be conducted through a non-profit water research foundation and sponsored by drinking water utilities, to assist suppliers of drinking water in adapting to the effects of climate change.

SECTION 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; and

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 standards 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.

SECTION 3. *Annual Reports.* – The Department of Environment and Natural Resources 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.

SECTION 4. *Appropriations.* – The amount necessary for the initial implementation of this Act shall be charged against the appropriations of the Department of Environment and Natural Resources 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.

SECTION 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 hereof.

SECTION 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.

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

Approved,

/apm28August2015