

Republic of the Philippines  
**HOUSE OF REPRESENTATIVES**  
Quezon City

Eighteenth Congress  
First Regular Session

HOUSE BILL NO. **4446**



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Introduced by Honorable Deogracias 'DV' B. Savellano

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**EXPLANATORY NOTE**

The Philippines, a tropical country was ranked 4<sup>th</sup> in the Global Climate Change 2016, faces serious threats from extreme weather disturbances and human-induced soil degradation that is a major threat to food security.

Soil degradation is a severe global problem of modern times. About 6 million hectares of agricultural land worldwide become unproductive every year due to the various soil degradation processes. The problem is much more serious in tropical than in temperate areas since tropical soils are more prone to degradation because of the nature of their properties and the prevalent climatic conditions.

Countries in Asia and Africa that depend upon agriculture as the engine of economic growth are believed to suffer the greatest impact of soil degradation. In the Philippines, soil degradation is one of the most serious ecological problems today. Also, the National Action Plan (NAP) from 2004 to 2010 identified soil degradation as a major threat to food security in the country. NAP reported that about 5.2 million hectares are seriously degraded resulting to 30 to 50% reduction in soil productivity.

Soil degradation is the process which lowers the current or future capacity of the soil to produce goods or services. It implies long-term decline in soil productivity and its environment-moderating capacity. Since natural degradation is slow, the present concept of soil degradation according to the Global Assessment of Soil Degradation (GLASOD) focuses on a human-induced process. Soil degradation occurs because of drastic changes or disruption in the normal processes of soil formation due to human activities.

In a review paper on the problem of soil degradation in the Philippines published in the Annals of Tropical Research vol.31, it was revealed that soil erosion is the most widespread process of soil degradation and is also the 'most studied in the country. Other important but less studied soil degradation processes include loss of nutrients and organic matter, salinization, acidification, pollution, compaction, and subsidence. Studies reviewed have shown that the widespread degraded upland soils possess chemical and physical

constraints for crop growth like acidic or calcareous pH, low organic matter and nutrient contents, shallow solum, presence of toxic substances and compaction.

There is a need therefore for more data on the physical and socio-economic characteristics of degraded lands to aid in the formulation of appropriate soil management strategies.

The absence of appropriate soil management would cause further soil deterioration and thus aggravate the ecological problems that are now occurring.

The state recognizes the need for food intensification through proper fertilizer recommendation, soil amendments and use of highly yielding varieties as stipulated in Presidential Decree No. 1435 entitled , “ Authorizing the Bureau of Soils, now the Bureau of Soils and Water Management, to supervise, regulate and control the establishment and operations of all soil laboratories in the Philippines.”

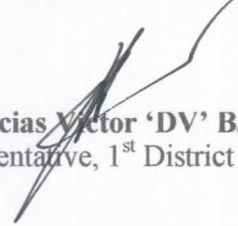
There is a need for the Department of Agriculture to develop a comprehensive soil degradation assessment with the use of modern and advanced soil analysis result in administering their programs to prepare for the effects of climate change and in the identification of land suitable for cropping. The department has to conduct compulsory national soil sampling to guide concerned agencies and the farmers in determining nutrient deficiencies in soils in specific areas across the country.

Augmentation of competencies have to be upgraded in terms of upgrading soil and plant analytical laboratories (SPAL), in-situ soil and water analysis and the conduct of research, development and training for laboratory staff in order to achieve standardization in soil sampling techniques, calibration of laboratory and in-situ soil tests protocols, and management of soil databases including updating of records and soil maps for maximum utilization of resources. The Bureau of Soils and Water Management (BSWM) have to establish laboratories in every municipality and strengthen its technical expertise, improve facilities and acquire mobile technologies to adequately execute these services.

Further, it is the responsibility of the State to ensure coordinated and continual appraisal of soil's health to ensure its capacity to produce available, accessible and affordable food for every Filipino, thus making Philippine agriculture sector sustainable and competitive.

There is urgent need therefore to institutionalize a national soil health program and operationalize the nationwide soil analysis of all agricultural farmlands for accurate and timely determination of soil fertility expressed in terms of appropriate crop-fertilizer application, soil rejuvenation and soil amendments, and appropriate funds thereof to improve agricultural productivity, ensure food security and promote rural development.

In view of the foregoing, the passage of this measure is earnestly sought.

  
**Deogracias Victor 'DV' B. Savellano**  
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Republic of the Philippines  
**HOUSE OF REPRESENTATIVES**  
Quezon City, Metro Manila

Eighteenth Congress  
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**HOUSE BILL NO. 4446**

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Introduced by **Hon. DEOGRACIAS VICTOR 'DV' B. SAVELLANO**

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**AN ACT INSTITUTIONALIZING A NATIONAL SOIL HEALTH PROGRAM FOR THE  
OPERATIONALIZATION OF NATIONWIDE SOIL ANALYTICAL SERVICES AND PROMOTION OF SOIL  
CONSERVATION AND FERTILITY MANAGEMENT OF ALL AGRICULTURAL LAND IN THE COUNTRY  
AND APPROPRIATE FUNDS THEREOF TO ABATE SOIL DEGRADATION AND IMPROVE AGRICULTURAL  
LAND PRODUCTIVITY AND THEREBY ENSURE FOOD SECURITY**

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

Section 1. Short Title. This Act shall be known as the National Soil Health Program Act of 2016

Section 2. Declaration of Policy. The Philippine Constitution's Article II, Section 16 specifies that "*The State shall protect and advance the right of the people to a balanced and healthful ecology in accord with the rhythm and harmony of nature.*" As a member of the global community of nations and signatory to the United Nations Convention to Combat Desertification, Land Degradation and Drought (UNCCD), the State has commitment to *forge a global partnership to reserve and prevent desertification/land degradation and to mitigate the effects of drought in affected areas in order to support poverty reduction and environmental sustainability.* The State therefor shall promote sustainable agricultural land management practices to assure soil health and protect our agricultural lands from degradation; the soil being the patrimony of the nation to be bequeathed to the next generation.

Section 3. Definition of Terms. For this Act:

- (a) "Soil" versus "Land" versus "Agricultural Ecosystem" – "Soil" refers to the medium for growing of crops, the top layer of the earth, a natural body formed by the weathering of mineral and organic materials. Soil is a component of "Land", a broader concept that besides the soil component, also includes vegetation, water and climate. "Agricultural Ecosystem" would include the social and economic dimensions in an agricultural land.
- (b) "Soil Health" is also referred to and can be interchanged with the term "Soil Quality" and refers to the continued capacity of the soil to function as a vital living ecosystem that sustains plants, animals, and humans. This definition includes the importance of managing soils so that they are sustainable for use by the future generations. The definition also encompasses assessment of "soil biodiversity" in addition to the

prescribed soil tests conducted to determine soil quality. The soil as “healthful ecology” as specified in the Philippine Constitution would be expected to perform all five essential functions – (1) regulating water; (2) sustaining plant and animal life; (3) filtering and buffering potential pollutants; (4) cycling nutrients; and (5) providing physical stability and support. Soil health problem would necessarily be impeding of either, some of, or all of the five functions of a healthy soil ecosystem. Soil health cards shall be prepared and used.

- (c) “Soil Productivity” is defined as the capacity of the soil in its normal environment to support plant growth and reflected in terms of crop yield for agricultural lands or in terms of vegetation growth (biomass yield) for forest lands. Soil fertility would be a component of productive soils, the other components being soil aeration and drainage, soil structure, soil texture, bulk density, and other soil physical, chemical, and biological properties that would contribute to smooth nutrient and water movement for crop uptake. A productive soil is not necessarily fertile (for which soil amendments can be done to correct the limitation) and a fertile soil is not necessarily productive if other soil properties are not optimal for nutrient movement (such as when we have a fertile soil but with poor drainage resulting in frequent waterlogged condition).
- (d) “Soil Fertility” is defined as the ability of the soil to supply essential plant nutrients in adequate amount and proportion. In reports and maps, it refers to summary rating for soil tests conducted to measure available soil nutrients such as nitrogen, phosphorus, potassium, and micronutrients to determine adequacy for crop uptake or if further amendments are needed. Based on soil tests, a high soil fertility rating indicates the soil has a greater ability to supply nutrients and less fertilizer would be needed while a low soil fertility rating indicates the opposite. Calibration trials are conducted with different fertilizer rates to determine the optimal rate for best crop response. Soil fertility is but just a component that makes agricultural lands productive.
- (e) “Sustainable Land Management” versus “Soil and Water Conservation”. “Sustainable Land Management” is defined as the use of land resources – including soils, water, animals, and plants – for the production of goods to meet changing human needs, while simultaneously ensuring the long term-term productive potential of these resources and the maintenance of their environmental functions (UN Earth Summit, 1992). This would make “soil and Water Conservation” as an important component of sustainable land management; soil conservation being focused on prevention of soil loss from erosion. Soil conservation can also refer to measures undertaken to prevent soil fertility decline, acidification, salinization, or other soil chemical contamination.
- (f) “Soil Degradation” follows the definition by the UN Food and Agriculture Organization (FAO), and refers to change in the soil health status resulting in a diminished capacity of the ecosystem to provide goods and services for its beneficiaries. This has wider scope and would include decline in biodiversity and water-related goods and services, as well as decline in other land-related social and economic goods and services. Following the UNCCD reporting practice, land degradation is not measured directly but recognizes that land use change is the major driving force of land degradation; and thus, Land Use System Map (LUS) and comparative LUS change is done to assess the extent of land degradation.

- (g) "Crop Suitability" versus "Land Suitability" – In "Crop Suitability", we have a pre-defined crop or crop group and we look for areas where the crops can be grown. This is rarely undertaken for rural development planning since the area is already pre-defined, crops are already being grown, and we intend to make the best use of the land by comparing other alternative crops in terms of technical, economic, and cultural feasibility. "Land Suitability" matches existing land qualities with the crop requirements and this is the kind of suitability referred to in this Act, following the FAO 1976 Land Evaluation Framework. In land suitability, various land use types are studied and compared for best land use options.
- (h) "Soil Analytical Services" refers to standard laboratory procedures conducted by a typical soil laboratory for quantitative as well as qualitative measurements of various soil physical and chemical properties. Soil analytical services vary depending on the purpose of soil sampling, the most common are for fertility testing program, for soil classification and mapping, and for experimental research (comparative before and after treatment). By definition, soil biological determinations are not included as part of routine soil analytical services, thus, the soil biodiversity component of this Soil Health Program would be considered more as research in nature than part of prescribed laboratory standard analytical practice. Soil health cards shall be used.
- (i) "Mobile Soil Clinic" is more of a concept than a vehicle-dependent soils laboratory providing qualitative soil analysis to farmers on regular basis, and serving as an extension arm of a more sophisticated soils laboratory in the region. Depending on the availability of funds, it is up to the Implementing Rules and Regulation (IRR) following this Act to concretize the concept whether it will be a literal solo vehicle for soil analysis that would go to various farm villages, or part of a multi-disciplinary and comprehensive mobile agricultural laboratory services, or a simple motorcycle and soil test kit grant to extension workers who will be trained on qualitative soil analysis, or a fixed or part of a fixed barangay-level or municipal –level agricultural services booth where farmers can bring their soil samples.

#### Section 4. Coverage.

- (a) This Act covers all agricultural farm lands under the Network of Protected Areas of Agriculture and Agro-Industrial Development (NPAAD) as mapped by the Bureau of Soils and Water Management (BSWM), the lead agency for the implementation of the National Soil Health Program.
- (b) However, for practically, the coverage will be undertaken in phases as will be enunciated on the IRR that will be developed following the Act. Such phasing can be undertaken as sub-program of the banner crop commodity programs of the Department of Agriculture (DA), starting with the Rice Program for major rice soils, then the Corn Program for major corn soils, and the High Value Crops Program for uplands devoted to high value crops.
- (c) The BSWM is also authorized to conclude Memoranda of Agreements with other government agencies such as the Philippine Coconut Authority for agricultural areas devoted to coconuts, the Sugar Regulatory Administration for sugar lands, and with the Local Government Units in coordination with the DA-Regional Field Units for the

Strategic Agriculture and Fisheries Development Zones (SAFDZ as the agricultural component of the Comprehensive Land Use Plan (CLUP) as required by the law.

## **CHAPTER 1 – ASSESSMENT AND MONITORING OF SOIL HEALTH**

### **Section 5. Soil Health Assessment Objectives and Design.**

- (a) Determining objectives of soil health assessment. BSWM shall provide technical assistance and advice to collaborating agencies and local government units and other proponents to define goals and objectives for soil health assessment and clarify what they hope to achieve; and therefore be able to design appropriate assessment protocol and accompanying soil health indicators that can be gathered during the course of field work.
- (b) For BSWM in-house soil health assessment objectives, its mandated functions are focused on soil classification and mapping, agricultural land resources evaluation and sustainable management, soil and water resources management and conservation, and soil and water resources research.
- (c) Depending on the purpose and objective of the soil health assessment, BSWM shall define soil health indicators for Agricultural Ecosystems based on the following criteria – (1) easy to measure, (2) measures changes in soil functions, (3) encompasses physical, chemical, and biological properties of the soil, (4) applicable to be measured in the field, and (5) sensitive to variations in climate and crop management.
- (d) For non-agricultural ecosystems, including urban soil ecosystems desiring to benefit from this Act, soil health indicators shall be mutually agreed with the collaborating agency depending on the purpose and objective of soil health assessment.
- (e) For purpose of unity of parameters for multi-temporal and multi-spatial soil health assessments, BSWM can design and standardize indicators per specific soil health assessment objective subject to further review and refinements.

### **Section 6. Information Collection and Field Work Validation**

- (a) Mobile Soil Clinics as extension arms of DA-Regional Field Units Soils Laboratories or as Local Government Unit-initiated facility shall be established, provided with the necessary materials, equipment and expertise to undertake soil sampling and soil analytical services for purpose of soil health assessment.
- (b) A variety of methods, approaches and strategies based on international standards and state-of-the art shall be recommended. It will be for the IRR to establish the necessary consultation mechanism with the state colleges and universities as well as with the relevant professional organizations, and other relevant stakeholders since the methods for various strategies and approaches for soil health assessment cannot be legislated.
- (c) It is recognized that for the soil biodiversity component of soil health assessment, there is not enough expertise neither are there enough local studies to establish standards and

that some very specific tests for biological properties are done by specialized laboratories and equipment. The biological component of soil health assessment can be undertaken as research activities from which various funds sources can be explored and the results of the studies attributed to the area where the study was conducted as part of soil health assessment until such time that soil biological assessment protocols applicable to Philippine conditions can be confidently established.

#### Section 7. Supervision and control of soil laboratories

- (a) This Act amends Presidential Decree No 1435 Series of 1978 issued before the enactment of Local Government Code (Republic Act 7160) and Executive Order 116 Series of 1987 reorganizing the Department of Agriculture.
- (b) As the national soil resource agency, BSWM is hereby mandated to formulate and set comprehensive guidelines for the establishment of soil laboratories in the Philippines; grant license and impose fees for private soil laboratories.
- (c) BSWM shall formulate and establish soil testing standards and methodologies.
- (d) BSWM shall supervise and coordinate soil testing activities of government and private soils laboratories.
- (e) BSWM shall conduct comparative performance laboratory tests of standard soils laboratory equipment, especially for DA-Regional Field Units, other government soils laboratories, and private soils laboratories on regular basis to assure competent and reliable service to the public.

#### Section 8. Information Analysis, Data Evaluation and Integration of Results for Improving Soil Health

- (a) Standard and state-of-the art scientific practices shall be undertaken for data analysis and evaluation which include but not limited to detection of patterns and observation consistency, results comparison, baseline versus targeted values, and data interpretation. This Act cannot legislate the establishment of standard values but where theoretically possible based on long-term field validation and despite inherent soil variability, BSWM should be able to define threshold values for most commonly used soil health indicators given variety of objectives for soil health assessment.

### **CHAPTER 2: DIAGNOSTIC RESULTS EVALUATION AND ACTION PLANNING**

#### Section 9. Soil Health Diagnostic Results

- (a) Soil health problems identified as results of Soil Health Assessment shall be appropriately addressed with funds sourced from existing agricultural and environmental banner programs implemented by relevant government agencies supplemented by their respective operational budgetary appropriations.
- (b) Local Government Units, assisted by BSWM in updating their SAFDZs, should be able to come up with sustainable land management programs as part of the overall agricultural development component of their Comprehensive Land Use Plan.
- (c) At the national level, BSWM shall consolidate soil health diagnostic results as input to various rural development plans and programs – e.g., Medium Term Development Plan,

Philippine National Action Plan (NAP) to UNCCD and other relevant international conventions where the country is a signatory, etc. the IRR to come out from this Act shall provide a range of reporting tools and decision support tools and list of oversight agencies requiring inputs on soil health status at national level, as per consultation with relevant stakeholders.

- (d) BSWM shall publish soil health assessment protocols and indicator standards depending on the objective of the assessment as they are scientifically and confidently established under Philippine conditions.

#### Section 10. Formulation of Recommendations and Alternatives: The Decision Support Tools for Sustainable Agricultural Land Management

- (a) BSWM is mandated to formulate measures and guidelines for effective soil, land, and water resources utilization. The agency shall provide technical assistance to Local Government Units in their SAFDZ preparation to come up with Land Suitability Maps and Soil Fertility Maps, incorporating results of Soil Health Assessment, and providing technical assistance on agricultural land use alternatives to address emerging issues and concerns.
- (b) At the national level, BSWM shall update its various decision support tools and derivative maps incorporating results of Soil Health Assessment – NPAAD, Key Production Areas, various commodity-based cropping system maps, Land Use System Maps, etc.
- (c) BSWM shall incorporate Soil Health Assessment (that is, include biological component) in its existing soil and land resources evaluation as well as soil conservation and water resources management projects and activities, and protocols.

### CHAPTER 3 – MONITORING AND EVALUATION

#### Section 11. National Soil Health Program Sustainability and Long-term Vision

- (a) BSWM in coordination with the Agricultural Training Institute shall provide continuing education and training on Soil Health Assessment, Agricultural Land Resources Mapping, as well as Sustainable Land Management for Local Government Units and its other clientele.
- (b) Where applicable, BSWM should assist the Local Government Academy develop courses on SAFDZ delineation as the agricultural component of the Comprehensive Land Use Plan integrating topics on soil health, land degradation, and sustainable agricultural land management.
- (c) BSWM shall develop evaluation tools and performance incentives to rate Local Government Unit's dedication to addressing land degradation as a strategy to combat poverty through its various agricultural and natural resource management programs resulting from the National Soil Health Assessment Program.

### GENERAL PROVISIONS

## Section 12. Initial Appropriation

- (a) For the first year implementation of this Act, the BSWM organization shall be strengthened with the establishment of a coordination of other similar national agricultural resource management programs such as the soil fertility component of the National Organic Agriculture Program.
- (b) Initial appropriations shall be needed to strengthen the DA – Regional Field Units' Soils Laboratories and establish its extension Mobile Soil Laboratories, provide equipment and trained manpower following the phase by phase implementation by defining priority (pilot) regions and/or commodity crops.
- (c) Initial appropriations to augment existing BSWM operational budget to manage the implementation of the National Soil Health Assessment Program as provided for in this Act. This should include the training component to capacitate Local Government Units as well as DA banner commodity program staff as development partners in this National Soil Health Program, per diem and transportation of staff to projects, materials and supplies, and other related operational expenses.

## Section 13. Continuing Appropriations

- (a) A specific P/A/P in the BSWM appropriated budget shall be annually allocated either as a singular budget item for National Soil Health Assessment Program or as part of BSWM share in the implementation of commodity-based DA banner programs for which the amount is specified for this soil health program.
- (b) Capital outlays for strengthening Regional Soils Laboratories and for Mobile Clinics may be directly appropriated to the implementing DA Regional Field Unit but additional BSWM appropriations will be needed to implement the provisions of Section 7 of this Act (Supervision and Control of Soils Laboratories).

## Section 14. Implementing Rules and Regulations

- (a) The Secretary of Agriculture, within 90 working days after the effectivity of this Act, shall direct the Director of the Bureau of Soils and Water Management, in consultation with other government agencies, state colleges and university, relevant professional organizations, relevant non-government organizations, the Local Government Units, the Department of Environment and Natural Resources, the Department of Interior and Local Government, the Department of Science and Technology, the Department of Budget Management, and the Civil Service Commission and in coordination with the Congressional Oversight Committee on National Soil Health Assessment, shall promulgate the rules and regulations for the effective implementation of this Act.
- (b) The Secretary shall submit to the committee on Agriculture of both House of Congress copies of the Implementing Rules and Regulations (IRR) within 30 days after their promulgation.

#### Section 15. Congressional Oversight Committee on National Soil Health Assessment

- (a) A Congressional Oversight Committee on National Soil Health Assessment is hereby created to be composed of the Chairs of the Committee on Agriculture of both Houses, six members of the House of Representatives and six members of the Senate, to be designated by the Speaker of the House and the President of the Senate, who shall endeavor to have the various sectors and regions of the country represented.
- (b) The chairs of the Committee on Agriculture in the Senate and in the House of Representatives shall be respectively, the Chair and Co-Chair of the Oversight Committee.
- (c) The Committee shall oversee and monitor the implementation of the National Soil Health Program, its projects and activities and its allied concerns both in public and private sectors with the end view to provide legislative support and assistance within the powers of Congress to ensure their inclusion, wherever feasible, in the national, regional, provincial, municipal and agricultural development plans to see them through their successful implementation.
- (d) The Committee shall hold hearings, secure testimonies and reports pertinent to its specified concerns; secure technical information and submission of recommendations or plans as it may require, use resource persons from the public and private sectors as maybe needed; and submit periodic reports on its findings and make recommendations and actions.

#### Section 16. Repealing Clause.

- (a) All laws, decrees, executive issuance, rules and regulations inconsistent with this Act are hereby repealed or modified accordingly.

#### Section 17. Separability Clause.

- (a) The provisions of this Act are hereby declared to be separable and in the event one or more of such provisions are held unconstitutional, the validity of the other provisions shall not be affected thereby.

#### Section 18. Effectivity.

- (a) This Act shall take effect thirty (30) days from the date of its publication in the Official Gazette or in at least two (2) newspapers of general circulation.

*Approved,*