STATUS OF NATIONAL SOIL RESOURCES-PHILIPPINES

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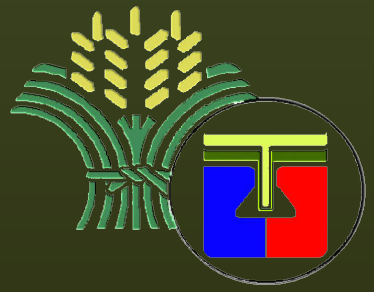


OUTLINE OF PRESENTATION

- Introduction
- Status of Soil Resources in the Philippines
- Main issues and soil threats – land degradation
- On-going activities: our banner programs
- National priorities for sustainable soil mgt
- IYS Activities

INTRODUCTION

- The Republic of the Philippines consists of 7,107 islands grouped into Luzon, Visayas and Mindanao.
- Population is 100 million people, the 7th most populated country in Asia and the 12th in the world.
- Land area is approximately 343,448.32 sq km or roughly about 30 M hectares of which 15.9 M is non-alienable and non-disposable (forest lands). Of the remaining 14.1 M disposable, we have about 11 M hectares agricultural lands of which 9 M hectares are considered prime.
- Climate is tropical
- Capital is Manila

Introduction (History of soil resources inventory)

- 1903 = the first soil survey in the province of Batangas was conducted by Clarence Dorsey
- 1934 – actual provincial soil surveys began when the Soil Survey Committee was established by then Secretary of Agriculture and Commerce
- Reconnaissance soil surveys were conducted and the soil series was the key pedological unit for mapping the soils of the province. Profile observations recorded the key characteristics of the soil series.

Introduction

- 1951 (June 5) – the Bureau of Soil Conservation was established.
- The 1960's - renamed Bureau of Soils in 1964, reconnaissance survey of the provinces completed by mid 1960's. (Varying map scales)
- The 1970's – detailed soil surveys (1:10,000 map scale) for major irrigation projects in Central Luzon, FAO-funded
- 1980's – semi-detailed soil surveys (1:50,000) of provinces based on USDA Soil Taxonomy
- 1990's – technical cooperation with JICA which extended until 2005. Semi-detailed provincial soil surveys continued.
- 2000's to present– municipal-level soil surveys through co-financing with local government.

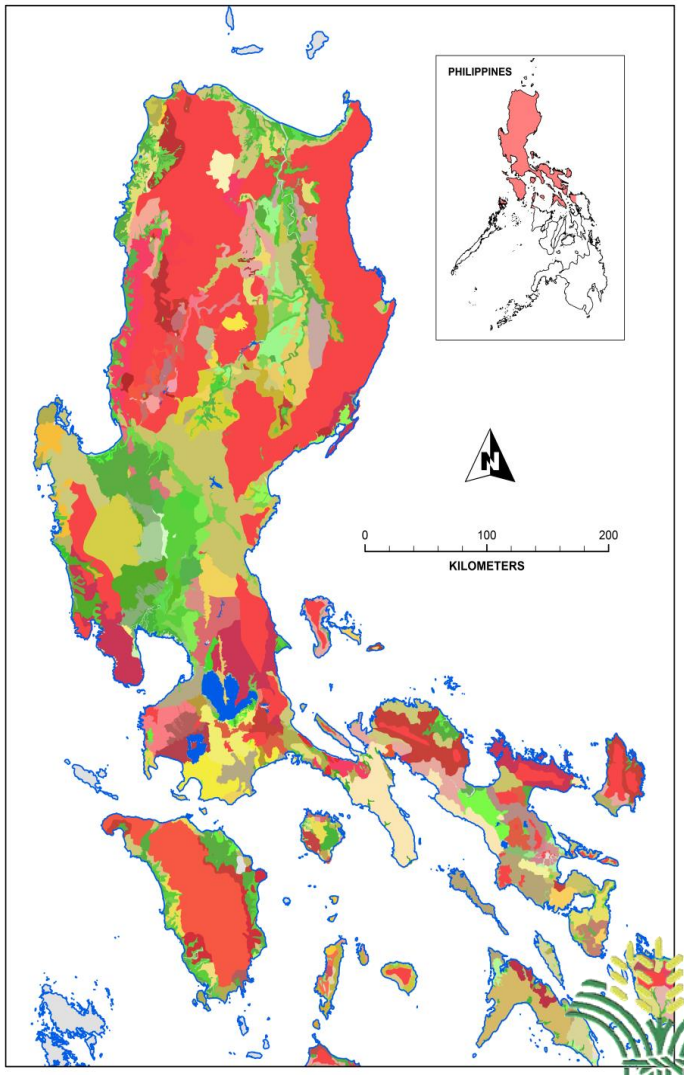
STATUS OF SOIL RESOURCES

- BSWM is still into classical soil survey method for routine or regular project implementation following USDA methods. The Soil Survey Division conducts soil classification and mapping.
- We have just gone through re-organization and two divisions were combined to establish the Geomatics and Soil Information Technology Division.
- All existing maps (converted from analog to digital) are available in the BSWM Homepage thru the MAP PORTAL.
- Current plans and efforts are towards updating and re-issuance of the maps.

Status of soil resources

- The USDA Soil Taxonomy system of classification has been adopted by BSWM since the early reconnaissance soil surveys. The establishment of 348 soil series for the entire country strictly conformed with the definition requirements of the "Series", the lowest category, as described in the USDA Soil Taxonomy.
- The translation of the soil classes to World Reference Base (WRB), the international standard for soil classification system endorsed by the International Union of Soil Sciences, was completed under the DigitalSoilMap.net – China node in 2014 as part of the Harmonized World Soil Database Project. The final report was submitted to ISSCAS, the China Node leader in July, 2014.

Soil Map of the Philippines



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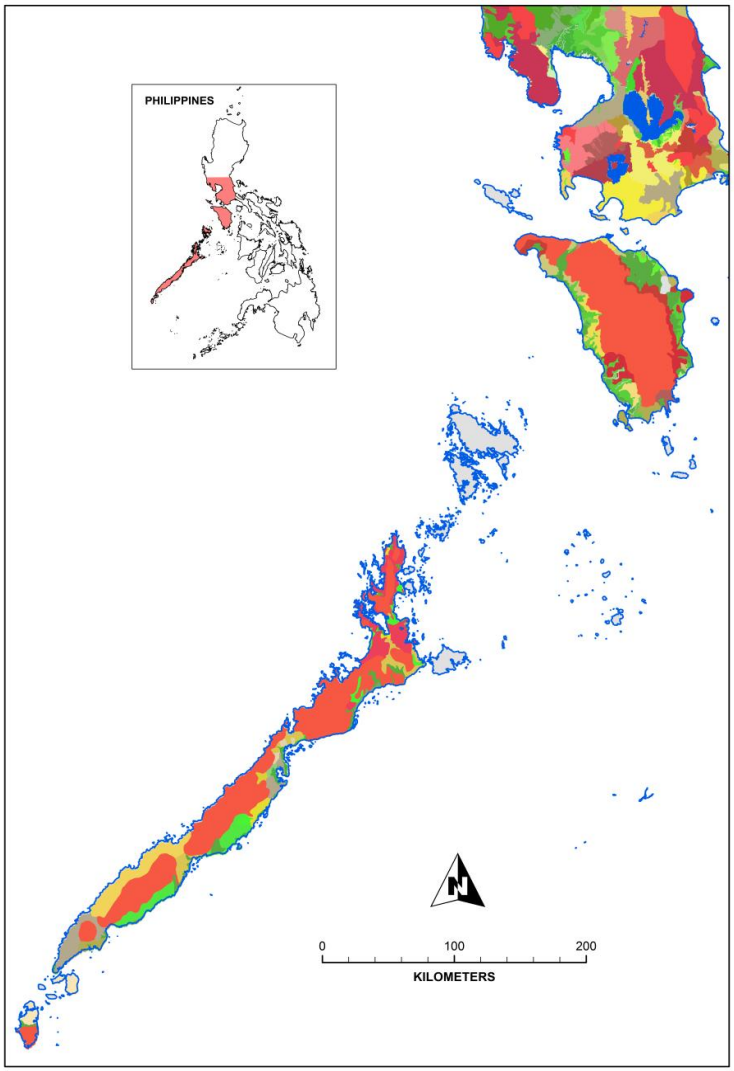
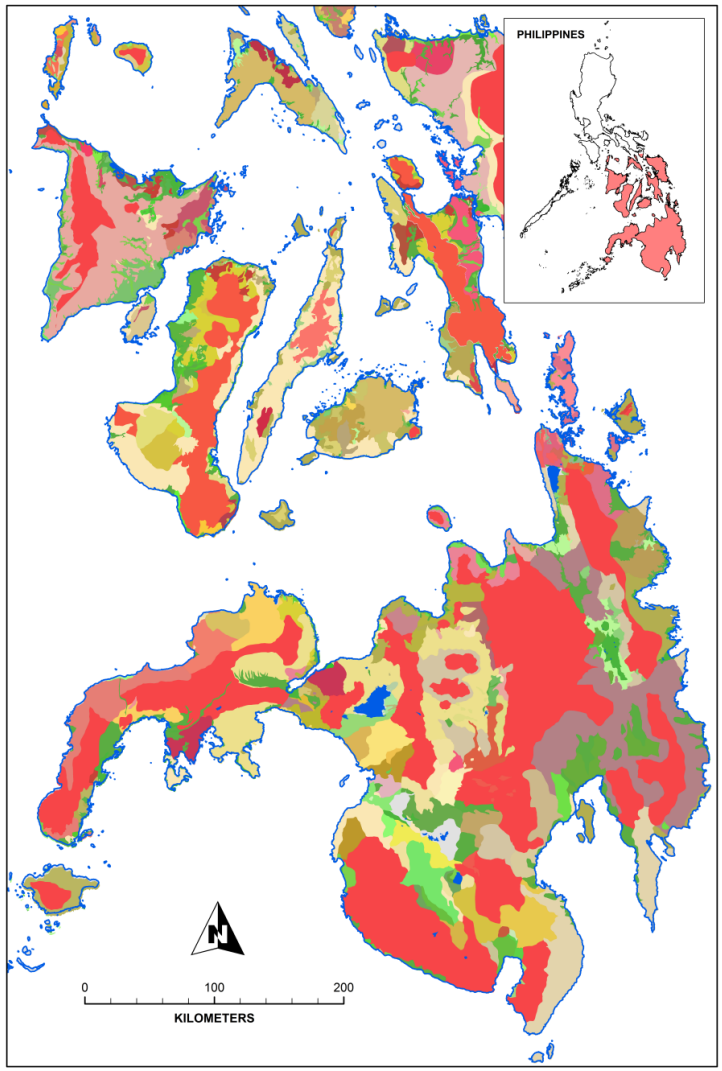




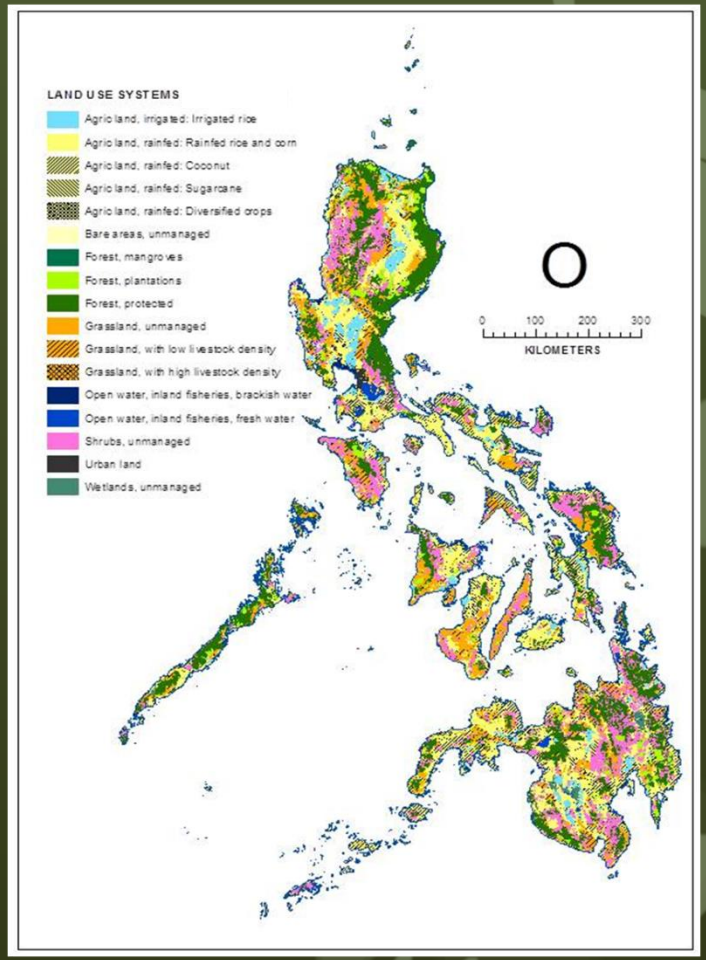
MAIN ISSUES AND SOIL THREATS

Based on the completed (2013) Land Degradation Assessment (LADA) Project, the main soil issues and soil threats are –

- Soil fertility decline for rice (generally lowland) areas
- Soil erosion for upland agricultural areas
- Land use conversion of agricultural areas to residential and other land uses and forest areas to other land uses could not be reflected at map scale; except for mangrove areas (positive area increase)
- Increasing water pollution based on chemical analysis of river systems is also a major land degradation concern

State of land degradation

- FAO-LADA defines land degradation as the reduction of the capacity of the land to provide ecosystem goods and services and to assure its functions over a period of time for its beneficiaries
- The greatest driving force of land degradation is land use change.
- We have completed the 2003 Land Use System (LUS) Map of the Philippines and the 2010 LUS finalization is still on-going. This is for national level assessment of land degradation



- Summary of land degradation based on 2003 LUS Map and compared with statistics from previous years

REGION	TYPE OF LAND DEGRADATION			
	Chemical degradation (soil fertility decline)	Water-induced soil erosion	Gains/(Loss) of bio-productive function of mangroves	Decline of surface water quality*
	(hectares)	(tons/ha/yr)	(hectares)	Rating based on DO and BOD of 19 Priority Rivers
CAR	7,624.35	11.05	(100)	Below water quality standards and worsening
I	113,142.97	10.16		-
II	244,981.78	10.80	1,898	-
III	317,611.53	9.70	(100)	Very below water quality standards but improving
NCR**	-	-	-	Very below water quality standards and worsening
IV-A	23,315.29	11.08	14,400	Very below water quality standards and worsening
IV-B	38,846.69	9.41		Below water quality standards and worsening
V	47,209.95	10.24	5,360	Within water quality standards
VI	88,638.48	11.77	(399)	Below water quality standards and worsening
VII	19,080.40	11.47	1,896	Within water quality standards but worsening
VIII	47,880.42	10.42	29,411	-
IX	0.00	11.91	(39,576)	-
X	35,838.89	11.77	4,388	Within water quality standards
CARAGA	26,255.69	9.89		-
XI	56,586.08	11.70	(4,628)	-
XII	107,295.12	9.50	26,082	-
ARMM	0.00	10.34		-
TOTAL	1,174,307.98	Ave=10.70	39,002	-

*Note: All figures represent 2003 benchmark data except for Open Water Land Use System (decline of surface water quality) which is comparative of 2003 and 2010 based on 19 Priority Rivers. There are also other important river systems in other regions but since they are not in the priority list and no data are regularly collected and available, the overall assumption is that the overall rating is within water quality standards but most probably worsening.

**National Capital Region (NCR)—no available data and no land degradation assessment done because of very high urbanization condition

Major Land Degradation Issues

- Reduction of forest vegetation due to socio-economic driving forces and consequent soil erosion by water, decline of biodiversity and wildlife, reduced water yield by the watershed, and increased flooding incidences.

Declining land productivity (soil fertility decline and loss of organic matter)

Table 1. Area coverage of soil chemical degradation due to fertility decline for agricultural areas, irrigated.
(Source: Philippine LADA Project based on BSWM Balanced Fertilization Fertilizer Groupings)

Type of Fertility Decline	Extent (has.)	Regional coverage
Agricultural lands, irrigated, group 1: soils in relatively dry areas with periods of very high rainfall and generally used for rice-based diversified cropping with signs of induced micronutrient deficiency, particularly zinc and in some areas, sulfur deficiency.	352,524.33	1,2,3,5
Agricultural lands, irrigated, group 2: Soils in wide variations of rainfall conditions where there are indications of soil nitrogen and phosphorus depletion.	613,008.56	2,3,4A, 4B, 5, 6, 7, 8, 10, 11, 12, 13
Agricultural lands, irrigated, group 3: Soils in highly intensity rice cultivation and located in the first large national irrigation system and where phosphorus, nitrogen, and zinc and sulfur deficiencies are induced by high dosage of urea and imbalance N:P fertilization.	134,246.92	3
Agricultural lands, irrigated, group 4: Soils in relatively dry areas associated with narrow alluvial strips and with relatively non-degraded soils.	*(50,266.52)** **No degradation*	4A, 4B
Agricultural lands, irrigated, group 5: Soils in relatively wet areas associated with narrow strips of multiple-land use areas and with relatively non-degraded soils.	*(85,617.23)** **No degradation*	CAR, 4A, 4B, 9, 10, 13
Agricultural lands, irrigated, group 6: Soils in the high rainfall limestone areas, flooded, and highly degraded, highly deficient in nitrogen and micronutrient, especially zinc.	73,769.66	CAR, 1, 2, 3, 4A, 6, 8, 13
Agricultural lands, irrigated, group 7: Soils in high, short duration rainfall, flood-prone, and saline-intruded areas, are generally deficient in zinc, crop failures are associated with coastal flooding during the rainy months, and severe salinity during dry months.	758.51	1, 3
TOTAL Agricultural Lands, irrigated with *Soil Fertility Decline*	1,174,307.98	-
TOTAL LUS-Agricultural Lands, irrigated	1,272,283.18	-
% Agricultural Lands, irrigated with soil fertility decline under BFS Program	92.30%	-

- Loss of bio-productive functions of the ecosystems due to other activities (land use conversion)

Original landuse	Converted to
Mangroves	Fishponds
	
Rice fields	Housing subdivisions
	

- Decline of surface water quality (pollution) due to various human economic activities and consequent algal blooms/eutrophication and water hyacinth proliferation resulting in death of aquatic life, shellfish toxicity, and the clogging of river systems.

- Flooding brought about by reduction of forest cover, consequent erosion and sedimentation (shallowing) of river systems and irrigation channels, and further compounded by clogging of waterways by pollution-feeding aquatic plants.

- Extreme climatic events and other natural calamities – typhoons, heavy rainfall (intensity and amount), droughts and volcanic eruptions.

- Impacts of biodiversity degradation in terms of increased incidence of pests and diseases, loss of natural predators (biological control), reported presence of invasive species originally brought in as biological control because of loss of natural predators or as food source.

ON-GOING ACTIVITIES

Responses on the soil issues and challenges: the BSWM Banner Programs relating to sustainable land management

Soil Conservation Guided Farms

- Provides technical assistance to upland and sloping land farmers on appropriate farming technologies that improve soil fertility and prevent soil erosion. Normally a joint project with the local government unit or the academe.

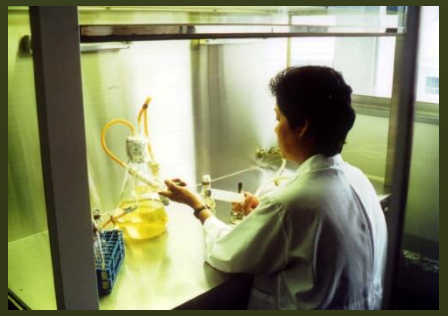
Sustainable Corn Production in Sloping Areas (SCoPSA)

Small Water Impounding Projects

Organic Agriculture Program – composting and vermicomposting

Use of compost fungus activators (*Trichoderma harzianum)*

Vermicomposting



Establishment of agromet stations with interpolated data available in internet 24/7

Cloud seeding operations to alleviate impacts of prolonged drought on standing crops

Legislative advocacy and agenda

- A glimpse on the trends in legislating policies on soil resources.

  14th Congress (2007-2010), laws passed : "Environmental Awareness and Education Act of 2008", Declared November of every year as the *"Environmental Awareness Month; Climate Change Commission; and Organic Agriculture Act of 2010*

- On-going bills on Soil Conservation and Land Use

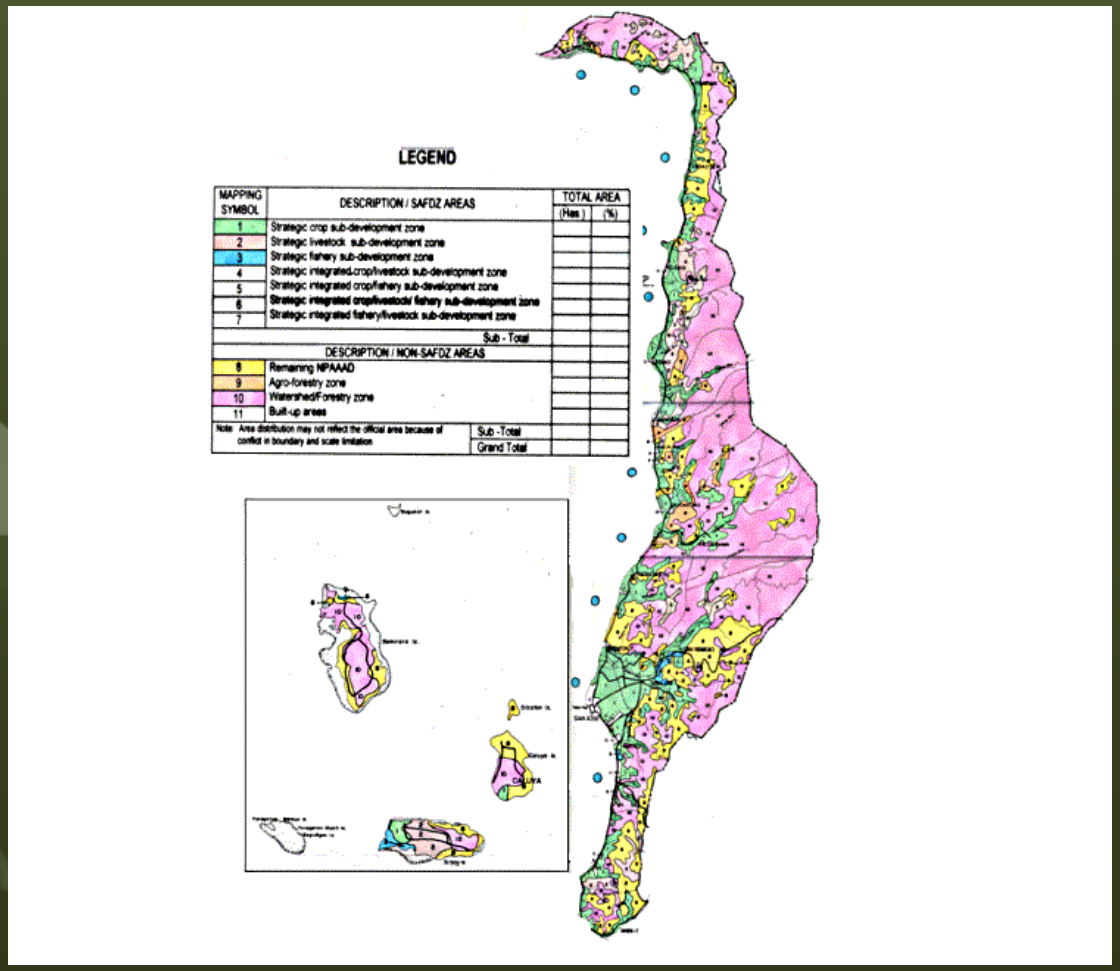
Improving Networks and Linkages

- Philippine Society of Soil Science and Technology especially for sustained and knowledgeable manpower on soil science for the country
- PhilCAT – WOCAT – ASOCON
- Asian Soil Partnership / Global Soil Partnership
- GlobalSoilMap.net (China Node)
- Monsoon Asia Agro-Environmental Research Consortium (MARCO, Tsukuba, Japan-based)
- Asian Food & Agriculture Cooperation Initiative (AFACI, South Korea-based)
- ESAFS (Nanjing is hosting the 12th edition Sept 2015)
- UNCCD – Philippines / Climate Change / Biodiversity/FAO
- One Map One National Geoportal
- Open Data Philippines

NATIONAL PRIORITIES FOR SUSTAINABLE SOIL MANAGEMENT

- Soil Survey and Classification – updating of soil maps at semi-detailed level, soil fertility mapping, and local land degradation assessment

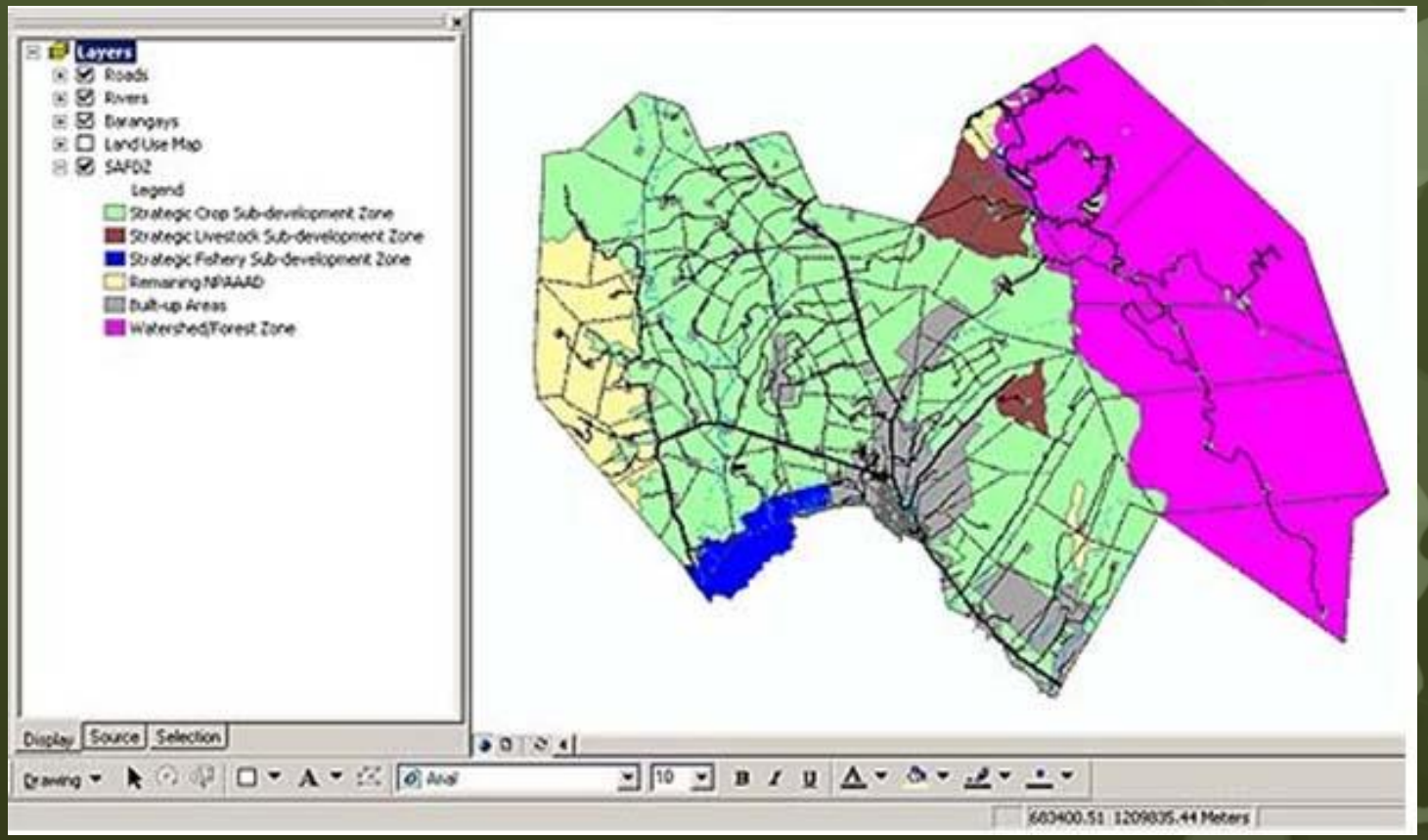
- Agricultural Land Management and Evaluation – technical assistance to local governments on Strategic Agriculture and Fisheries Development Zones (SAFDZ) and development of framework for agricultural investment priorities



- Water Resources Management – technical assistance on development of various rainwater harvesting structures and facilities (small water impounding project, farm reservoir, shallow tube wells, windmill/solar pumps, etc.)

- Soil Conservation and Management – reduced erosion through promotion of sustainable land management practices

- Geomatics and Soil Information Technology – update of Network of Protected Areas for Agriculture and Agro-Industrial Development (NPAAAD) and national level land degradation assessment



- Soil Research and Development – ISO accreditation of analytical laboratory (soil and water analyses) and midstream R&D on soil fertility (focus on organic agriculture), soil physics, chemistry, and soil biology

IYS ACTIVITIES

- Formal launching is May 25, 2015
- Objectives:

  - Increase awareness on the importance of healthy soils and encourage the youth to play a role in the protection and conservation of these resources

  - Strengthen regional alliance and unify actions on sustainable soil management in Asia through the conduct of international symposium

  - Sensitive decision maker and local stakeholders through the presentation of the gains of the IYS and the way forward to establish a healthy soil alliance.

Basic concept of IYS Activities

- Conduct fora, poster making contest, and quiz bee for selected elementary and high schools with the theme "Healthy soils for healthy life";
- Organize a regional symposium on Soil Health in collaboration with ASOCON members;
- Review existing country initiatives and programs to protect healthy soils in support to combating desertification, land degradation and drought (DLDD);
- Secure commitments from ASOCON members (which are also country Parties to the UNCCD) to protect healthy soils
- Undertake IYS culminating event to be participated by international partners, policy and decision makers, soil scientists, representatives from government and private sectors, non-government organizations, and youth representatives.

Thank you and good day!