

INITIAL KEY “HOT SPOT” NUTRIENT MANAGEMENT

Best Practice Summary

Introduction

The Global Environment Facility and UN Environment Programme recently launched a project entitled, **“Global foundations for reducing nutrient enrichment and oxygen depletion from land based pollution, in support of Global Nutrient Cycle”** to promote nutrient management best practices and policies in key “hot spots” in the developing world. The purpose of this project is to build capacity at the country level which fosters effective policy and investment interventions to address the threats to public health, biodiversity and economic growth, caused by nutrient pollution worldwide.



We Need your Help

The 2009 the World Food Summit on Food Security stated that the world must produce 70 percent more food by 2050 than currently produced to sustain a world population of 9 billion. There is widespread scientific agreement that intensification of food production and fertilizer use will increase nutrient loading to already-stressed coastal ecosystems, which is directly linked to “dead zones” of low oxygen. These hypoxic “dead zones” have increased almost nine times since 1969.¹

Proper nutrient management best practices must be scaled-up to ensure the long-term stewardship, conservation and sustainable management of our soil health and water resources. The Global Environment & Technology Foundation (GETF) is supporting the GEF and UNEP to develop a global “tool box” of nutrient management best practices. This inventory and analysis activity is intended to help the policy makers and small farmers in the developing world to scale-up and implement nutrient management best practices and establish an underlying policy foundation.

We request your assistance to engage experts in the developing world to gather best practices and case studies of successful or unsuccessful practice (in order to draw lessons what needs to be avoided) and project implementation.

¹Diaz, 2010



Current Best Management Practice Inventory

There are many examples of nutrient management best practices that are implemented in specific countries or regions. The current global inventory contains 290 nutrient management best management practices for predominantly for agriculture. The research supporting these practices comes from over 55 organizations including the GEF, UNDP, NRCS, EU and the World Bank. A significant amount of the research was conducted in the Danube River Basin in central and Eastern Europe. Another area that has considerable information about nutrient reduction is the Chesapeake Bay watershed in the U.S. In total, the “tool box” contains practices and other interventions from 55 different countries in North and South America, Europe, Africa and Asia. The research suggests improvements in agriculture, aquaculture, livestock, manure and wastewater practices can be achieved to reduce the level of nutrients entering our soils and waterways.

Initial Observations and Findings

There is substantial data and information available from the U.S. and European Union. In large part government agencies and other stakeholders agree that systems of practices, local, on-farm conditions and whole farm planning are the appropriate strategies for promoting proper nutrient management and nutrient use efficiency. While there are “pockets” of success in the developing world, higher technology solutions from the developed world may not be easy to replicate or scale for small holders in the developing world. The majority of projects and practices are from three “hot spot” regions: 1) The Lake Victoria basin; 2) Chilika Lake; and, 3) Manila Bay. More practices and cases must be collected and analyzed from key “hot spots” to draw sufficient conclusions regarding the potential for practice replication and scaling.

The following are key findings and observations across the three “hot spot” regions:

- Scarcity of fertilizers - thus the need to investigate bio-fertilizers, composts and concepts like micro-dosing.
- Many of the areas are already degraded so there is a need to control erosion, keep the ground covered yet have a viable agriculture system. This is where the major projects appear to be headed.
- The small size of farms presents an additional barrier to implementation of best practices. Overcoming this will take a concerted effort by all parties. It will likely be necessary to adapt the systems approach to function at the small farm scale or to look at opportunities to aggregate small farm parcels into agro-environmental management systems to allow application of conservation systems at a landscape rather than parcel scale.
- Alternatively, development of low cost “mini” versions” of a system of eight BEPs (and others) identified during work in Central and Eastern Europe for the GEF that could be adopted by small land holders with or without subsidy or external support should be pursued. Technical assistance could be provided in this scenario to help assure the BEPs are installed and/or managed to provide expected water quality impacts.
- Systems of practices seem appropriate for all “hot spot” regions:
 - Nutrient Management
 - Manure Management
 - Wetland Restoration/Creation
 - Riparian Buffers
 - Conservation Tillage/Erosion Control
 - Cover Crops
 - Grazing Management
 - Ecological/Organic Production Systems

*It is important to note that current project and practice information is inconsistent and challenging to collect, making it important to engage experts and other developing world stakeholders to gather more in depth data and information.

Initial “Hot Spot” Findings

Key discussion of specific “hot spot” region observations and recommendations is as follows:

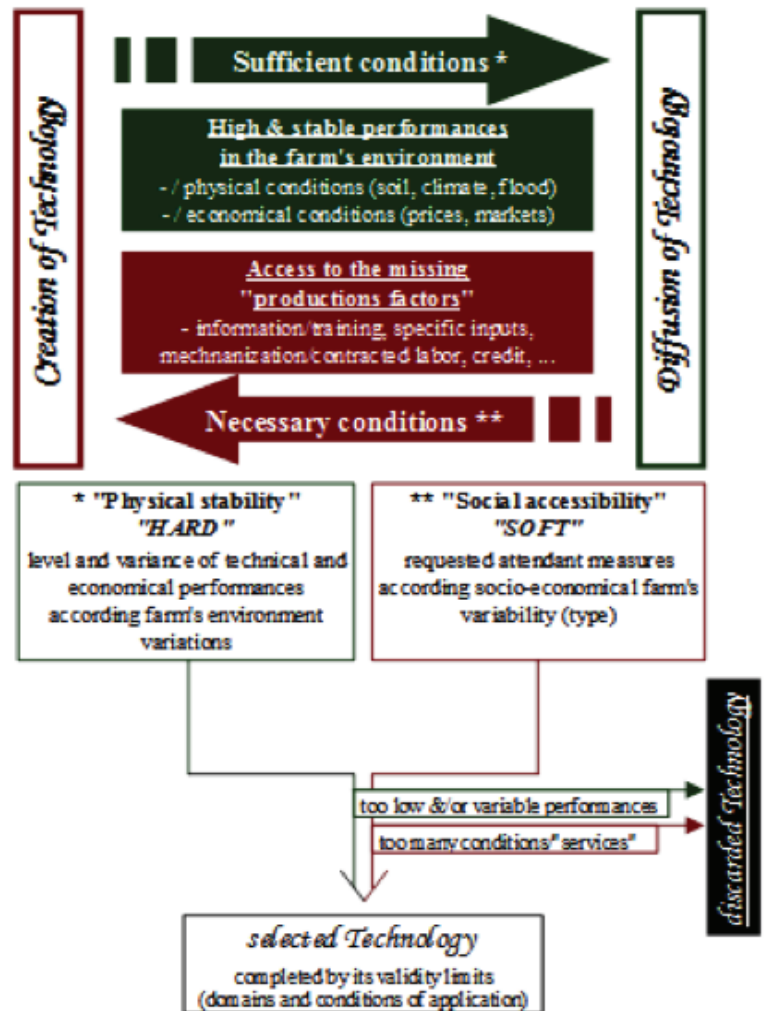
Chilika Lake

There is an emphasis on bio-fertilizers since the high cost and limited availability of synthetic fertilizers makes using bio-fertilizers a viable option. There needs to be some cross-utilization among “hot spots” of approaches to nutrient use efficiency and the 4R’s (Right Rate, Right Placement, Right Timing and Right Form). For instance, the “micro-dosing” approach being developed in the Lake Victoria arena is a tool that should be used in nutrient management planning to help optimize nutrient use efficiency as well as nutrient-source efficiency. The project on using seaweed as a sink for N in waters should be expanded to include re-use of harvested seaweed as a bio-fertilizer either as a dried product or a component of compost.

It would be useful to explore the 4R’s in relation to the use of bio-fertilizers especially at micro-dosing levels. Some thought regarding customizing the 4R’s to small holder applications should also be considered

Lake Victoria Basin

The value of soil testing was highlighted as a fundamental component of nutrient management. Knowing soil test results and having an association between soil levels and crop needs is invaluable to avoid situations where a valuable commodity, e.g., rock phosphate, can be used where most



needed.

The “micro-dosing” approach is a tool that should be used in nutrient management planning to help optimize nutrient use efficiency as well as nutrient-source efficiency. This should be part of a 4R’s approach for specific Lake Victoria conditions. This approach should be added to the nutrient management training module. The development of a model for organic and inorganic nutrient sources as a tool to make recommendations is a worthwhile goal.

The current model will have a higher impact on phosphorous utilization on phosphorous-limited soils. Additional work is needed to refine the nitrogen utilization between different sources. This work also impacts the 4R's and nutrient management in general.

Manila Bay

Key practices included "The Participatory Approach," which uses the premise that one does not come to the community with a solution to the problem when farmers do not know that they have a problem in the first place, and that farmers are part of the solution. Our minimum techno-demo farms are 25 hectares, with farmer average farm holding of 2 hectares. This approach should become part of the training module.

As with the other "hot spots" the project information available covered nutrient management with emphasis on production of organic fertilizers and should be incorporated in the 4R's. Also, the Manila Bay has a U.S. Agency for International Development SNREM CRSP project to develop conservation agriculture production systems (CAPS). The research is aimed at increasing smallholder's agricultural productivity and food security through improved cropping systems. In addition to increasing food security, CAPS will contribute to and take advantage of improved soil quality and fertility.

The farming systems with CAPS will:

- Maintain a year-round soil cover
- Minimize soil disturbance by tillage
- Utilize crop rotation systems
- Promote conservation agriculture as a technologically-feasible, economically-viable, environmentally-sustainable, and gender-responsive production system that will contribute to food security of small farm communities in the Philippines.



"Hot spots" have been identified in the World Resources Institute's interactive map of hypoxic and eutrophic zones (<http://www.wri.org/project/eutrophication/map>).

Get Involved

GETF invites you to contribute best management practices and case studies to the inventory, especially from key developing world "hot spot" regions. For more information, please email Chuck Chaitovitz at chuck@getf.org.