

# Regional Integrated Plant Nutrition Development System (IPNS) Development Program

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## ABSTRACT

The Fertilizer Advisory Development and Information Network for Asia and the Pacific (FADINAP) is implementing a program entitled Integrated Plant Nutrition Systems (IPNS) in five countries in Asia namely, Pakistan, the Philippines, Nepal, Sri Lanka, and Vietnam. The central theme is to train farmers in combining chemical and organic fertilizer inputs to optimize crop nutrient supply. The program is based on the fact that after more than 20 years of green revolution agriculture, increasing environmental damage has become apparent, which implies that current production patterns are unsustainable. It is envisaged that training farmers to re-integrate organic practices will help to achieve sustainable production and increase rural income.

## ORGANIZATIONAL SETTING

FADINAP is a program implemented by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP). The work of UNESCAP is carried out through seven substantive divisions, which includes the Population Rural and Urban Development Division (PRUDD).

PRUDD has several sections and FADINAP is located in the Rural Development Section (RDS) where it contributes to sustainable rural development and poverty alleviation by:

Building and improving rural institutions;

- Generating non-agricultural income; and
- Conducting economic analysis and improvement of farming inputs (e.g. fertilizers and pesticides).

Ongoing activities with regard to agrochemicals include:

- Fertilizers: FADINAP;
- Pesticides: Database on Pesticides and the Environment (DPE); and
- IPM: Economic aspects of Integrated Pest Management (IPM).

## FADINAP's Focus

FADINAP was started in 1978 as a program to support the green revolution by promoting the use of chemical fertilizers (via research, information, training). Subsequently, it has built a network of 27 member countries in the Asia-Pacific region. The network's focus has shifted over the years and, at present is concentrating on using the income-generating capacity of fertilizers—chemical and organic—to reduce rural poverty and environmental degradation. Currently, FADINAP is concentrating on:

- The promotion of IPNS;
- Collection, analysis, and distribution of agrochemical data through its web site;
- Publication of *Agro-Chemicals News in Brief* (a quarterly journal) for distribution in the region.

## **IPNS Program**

FADINAP, under the sub-component “Development of environmentally sound use of fertilizer”, is implementing a program to develop IPNS. Five countries are participating namely, Pakistan, the Philippines, Nepal, Sri Lanka, and Vietnam.

### ***Reasons for and Aim of IPNS***

By 2030 the world population is anticipated to have grown by 40 percent to 8.4 billion. No major expansions are expected in cultivatable land area, rather, what can be anticipated are reductions due to erosion. Therefore, increased food supply will have to come from intensification. However, despite growing fertilizer use, yields are stagnating or in some intensively cultivated areas, declining. There are some indications for a second green revolution, e.g. through genetically modified (GM) seeds, but this may still be a number of years in the future, considering the environmental effects they may generate. Therefore, efforts have to start immediately to stabilize agricultural production and to protect the environment against further degradation. Some of the methods may not be new, but have to be reviewed, adjusted, and integrated into modern agriculture for higher fertilizer use efficiency.

Therefore, the aim of FADINAP’s IPNS program is to assist member countries in rendering sustainable agricultural production patterns through the stabilization of soil fertility and raising of rural income. This can be achieved by combining the high nutrient concentration of chemical fertilizers with the incorporation of organic matter, i.e. compost, green manure, farmyard manure etc., to improve soil structure and control erosion.

### ***IPNS Structure***

After introducing a general framework for what IPNS should cover, FADINAP did not give detailed instructions for implementing the program. As a general guideline, three stages or phases were suggested:

*Phase 1* should contain a survey of prevailing farming methods on typical crops and regions and, a study of the state of research and implementation of IPNS, if any. This phase should conclude with a national workshop where the findings of the farming survey and literature and policy study are presented and a national IPNS concept is discussed and adopted, i.e. specifying crops and agroclimatic regions for IPNS trials.

- *Phase 2* should concentrate on the implementation of the IPNS concept in limited trials and small demonstrations, the training of participating farmers, verification to confirm whether the original choices of crops and locations were correct, and the design of extension/training materials.
- During *Phase 3* successful IPNS cases, recommended in Phase 1 and confirmed through field trials in Phase 2, should be propagated at larger scales to groups of farmers through demonstration and training using the extension/training materials prepared in Phase 2.

### ***Implementation***

The participating countries followed this general guideline to varying degrees. For instance, in Nepal it was felt that the preparation and use of compost was an important component of an emerging IPNS concept. Therefore, Phase 2 of the program was devoted to trials and comparisons

between different methods of compost preparation. Nepal is now making preparations to enter Phase 3, i.e. demonstrations and training of farmers. In Vietnam where combinations of organic and inorganic fertilization practices have remained intact even through periods of rapid expansion of chemical fertilizer use, trials, demonstration and training concentrated more on fine-tuning of and interaction between the different types of fertilization. Vietnam has concluded Phase 2 and is currently entering Phase 3 with a planned series of 12 training courses in different districts. In Sri Lanka the lack of linkages between organic and inorganic plant nutrition was felt most strongly and the need to change this resulted in the development of detailed IPNS concepts for crops and regions. Sri Lanka is presently in the final stages of Phase 2, concluding the development of training material, which will then be used in demonstrations and training of large farmers' groups. The Philippines is expected to conclude Phase 1 soon with the adoption of an IPNS concept and may then proceed, in a similar fashion to Nepal, to intensify training on compost preparation. Pakistan joined the program recently, starting with a field survey of current farming practices and the preparation and testing of IPNS training materials.

### **Potential for Future IPNS Development**

IPNS or IPNM (Integrated Plant Nutrition Management) is by no means a new concept. It rather tries to re-integrate organic forms of plant nutrition into what have become "modern" farming practices. After 30 years of the green revolution this is not a simple task. Techniques for soil fertility maintenance, used by earlier generations, have been forgotten, are considered cumbersome, or have become technically impossible. For instance, in many places farm animals have given way to machinery, and consequently the manure they produced is unavailable. Therefore, the role of the nation-wide farming surveys, as the first phase of the IPNS program, is to detect what is still feasible and practical on farms in terms of organic fertilization.

FADINAP's interest, however, is not primarily technical and the program is not meant to preserve or re-introduce organic practices for their own good. Organic methods are aimed at supplementing inorganic fertilizers, not replacing them, and they should not be promoted only because of their effects on the environment and sustainability of agricultural production. Supplementary organic methods, apart from long-term gains in environmental balances and the sustainability of production, should also offer demonstrable income advantages. For instance, in Nepal, farmers involved in a series of IPNS trials during Phase 2, applying scientifically improved methods of compost preparation and application, succeeded in doubling their production of cabbage. Although final data have not been submitted yet, this should have had a marked income effect, especially for female farmers, who are involved mainly in vegetable cultivation. Similar situations are emerging in Sri Lanka.

Although, FADINAP's program is small and limited to only a few countries, it is hoped that it will promote a review of plant nutrition and rural income generation concepts. FADINAP's resources to support the program have been depleted this year, but it is hoped that the principles of IPNS will be adopted by other agencies, national and international, farmers' groups and put into practice on an increasing scale.

In order to keep the momentum and encourage regional cooperation in IPNS, the current participants and other interested countries will be invited to exchange their experiences with IPNS at a regional meeting in Bangkok, later this year.