Manpower requirements for the fertilizer sector in sub-Saharan Africa

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Accepted 6 October 1987

Key words: manpower requirements, public policy, training, fertilizer sector, sub-Saharan Africa

Abstract. The manpower requirements are estimated for the fertilizer sector (production, marketing, and use) in sub-Saharan Africa from 1982/83 to 2002/3. The additional technical manpower requirements in sub-Saharan Africa over a 20-year period are about 15,917 persons for fertilizer production, 7959 for fertilizer marketing and 7958 for fertilizer use. It is estimated that, on the average, an additional 1592 persons will be required annually for the fertilizer sector. There is thus a need to establish —through both national and international organizations— appropriate fertilizer training facilities. This will relax serious manpower constraints in fertilizer sector development and thus will accelerate the contribution of fertilizer to economic growth in sub-Saharan Africa.

Introduction

At the Second General conference of the United States Industrial Development Organizatin (UNIDO) held at Lima (Peru) in March 1975, the Lima Declaration and Plan of Action on Industrial Development and Cooperation, commonly referred to as the Lima Declration, was adopted. In the Lima Declaration the role of industry was emphasized as a dynamic instrument of growth and essential for economic and social development in low-income countries. The Lima Declaration called for an increase in the developing countries' share of total world industrial production from 7% in 1975 to at least 25% by the year 2000 (UNIDO 1976).

The fertilizer industry was identified as playing an essential role in achieving the goal stated in the Lima Declaration. Development of the fertilizer industry was to be given priority for two reasons: (1) fertilizer is essential for increasing agricultural production and achieving food security in developing countries, especially those with serious food problems and (2) the fertilizer
industry provides an important link between the petrochemical industry and the agro-industrial sector.

The lack of well-trained manpower was identified as one of the serious constraints for the establishment and operation of a modern fertilizer industry in developing countries. The manpower (technical and nontechnical) requirements to manage and operate additional nitrogen and phosphate fertilizer plants between 1982 and 2000 were estimated to be 17,420 persons for Africa, 154,600 for developing countries, and 232,130 for the world as a whole (UNIDO 1978). On a yearly basis the manpower requirements for additional fertilizer plants between 1982 and 2000 were estimated to be about 1000 persons for Africa, 8600 for developing countries, and 12,900 for the world as a whole. The purpose of this paper is to estimate additional manpower requirements in the fertilizer sector—production, marketing, and use—in sub-Saharan Africa over a period of 20 years from 1982/83 to 2002/03.

Fertilizer consumption estimates

In order to estimate additional manpower requirements in the fertilizer sector, it is essential to first estimate fertilizer consumption in sub-Saharan Africa. The data for actual historical fertilizer consumption are derived (by summing up fertilizer consumption in individual countries in sub-Saharan Africa) from the Food and Agriculture Organization of the United Nations (FAO 1985). The projected fertilizer consumption has been estimated by extrapolating historical fertilizer consumption as follows:

\[ g_F = \left[ \left( \frac{F_n}{F_t} \right)^{1/n} - 1 \right] \]  
\[ F(n) = (1 + g_F)^n F(0), \]

where \( F \) refers to fertilizer consumption in terms of nutrients (N, P\(_2\)O\(_5\), or K\(_2\)O), \( n = T - t \) is the number of years between the initial (t) and terminal (T) years, and \( g_F \) is average annual compound growth rate in fertilizer consumption.

The growth rate in historical fertilizer consumption from 1972/73 to 1982/83 has been estimated to be

\[ g_N = 6.50\%, \quad g_{P_2O_5} = 7.65\%, \quad \text{and} \quad g_{K_2O} = 5.07\%. \]