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Organisation (FAO) in 1981, with a view to providing help with deliberations on the scientific basis for conservation situation and subsequent information to implementation. In 1981, Subsequently Nigeria became aware of this and called for the feasibility study on the establishment of a National Bureau of Conservation of plant genetic resources and the vegetation. In 1983, the Federal Ministry of Science and Technology, Lagos awarded a contract for the study to HENIMAN Development Company Limited, Enugu, an Agro-Business Services Company which completed the job in 1984.

The actual establishment of a conservation machinery in Nigeria became effective in 1991 when the Federal Government Promulgated a decree establishing the Natural Resources Conservation Council (NRCC) in Abuja under the Presidency. The question now arises, how effective is the council in germplasm conservation?

## THE CONSERVATION COUNCIL AND THE TASK AHEAD

It is expected that the council charged with the conservation of genetic resources diversity will realize the task ahead of them by sourcing and conserving endangered wild plant species. It is therefore necessary to highlight certain essential conservation strategies to be adopted by the council and all other non governmental organizations (NGOs) if a sustainable food production in Nigeria is to be achieved.

## GENETIC CONSERVATION STRATEGIES

### Exporation and Collection.

Frankel (1973) pointed out that, the first step in genetic conservation technique, is to establish through a survey, the baseline of the genetic resources of crops in the ecosystem. This is preceded by the identification of the following facts:

- a) The extent of genetic erosion that is actually taking place
- b) The urgent needs of breeders for particular materials. The needs would arise from the knowledge derived from screening or plant breeding work on the materials already existing in the stock collected
- c) The need for plant scientists to study genetic materials known to exist in a particular region which, because of their relationship to other genes or their occurrence in that same region, might prove to be useful to breeders.

## CONSERVATION.

Proper conservation of collected genetic materials is the major objectives for genetic sourcing. Therefore, this actually involves the establishment of standard gene banks. Frankel (1975) suggested the need for genetic resources centres with one or two kinds of seed collections, such as:

- a) Base collection, and (b) Active Collection

The former consisting of seed materials dried to 5-7% moisture content, sealed and stored at between -10 and -20°C for long-term storage and regeneration, and the latter consisting of seed materials kept under less than ideal storage conditions for medium-term storage, multiplication, evaluation and documentation and already quantized for immediate distribution. The

Seed storage is not the only method of genetic resources conservation. However, it is certainly the best for the storage of maximum genetic diversity in the minimum amount of space, apart from large-seeded materials such as coconuts. Seed materials that may be kept for very long periods (20-50 years) without regeneration at about 5% humidity and -20°C are referred to as "Orthodox seeds" (Roberts 1975). All seeds of field crop species belong to this group and are expected to undergo periodic regeneration test to ascertain their viability from time to time. All other crops that are susceptible to the same storage conditions as the orthodox seeds are known as "Recalcitrant". Few examples are rubber, oil palm, coffee, cocoa and cola nut seeds.

Globally, more than 100 countries have embarked on the conservation programme of germplasm (Hanson, 1984). Morel (1975) and Henshaw (1975) advocated a new genetic conservation strategy which is through meristem culture. In view of the general concern and desire to widen the genetic base of agricultural crops for genetic diversity, the techniques of tissue culture involves germplasm storage through growing tiny fragments of plant tissues in nutrient media from which plants can be regenerated after long periods of storage.

In Nigeria, modest efforts are in progress for germplasm conservation and gene pool establishment, though to a non-significant level. Non-significant in the sense that the administrative bottleneck and lack of sufficient financial resources from the Federal government to research institutes and universities intensify the work on conservation projects. It is for efforts made by the International Institute of Tropical Agriculture (IITA) Ibadan, National Root Crop Research Institute Umudike, Umuahia, National Institute of Horticulture (NIHORT) Ibadan and Institute of Agriculture Research, Ahmadu Bello University, Zaria, breeding works in Nigeria could have been paralysed. However, these Institutions have their lapses towards this goal, that is, they pay little or no attention to the sourcing and conservation of wild relatives of their crop varieties from which improved hybrid varieties could have been established. Most importantly is the protection of natural tropical forests which harbour genetic materials of the wild fruits, timber trees and medicinal plants which are of Nigeria origin.

## TEST RUN EVALUATION OF COLLECTED SEEDS.

There is an absolute need to screen the collected genetic materials before proper storage. This will avail the plant breeders the opportunity to know the nature and type of characters in the genes. Data on highly agronomic characters and on resistance to specific pests and diseases are of great interest to breeders and this will guide them to use collection for breeding purpose.

## COMPUTER DOCUMENTATION OF GENETIC INFORMATION.

The amount of genetic information anticipated from the test run evaluation will be vast and useful, therefore computerization of information storage and retrieval systems will be necessary to assist plant breeders. This enhances a rapid and reliable collection of



genetic information available from genetic stock will be necessary.

## GERMPLASM ENHANCEMENT.

Sequel to the information from the test for evaluation of the wild plant species collected for storage, the selection for the desired character will be cumbersome. This could make the breeders feel reluctant to use them in their crosses, because of the disadvantageous genes that would be transferred along with the one or two useful advantageous characters into their advanced breeding lines. This therefore required many years of backcrosses in order to eliminate the undesired characters from the wild primitive species.

## STAFF DEVELOPEMINT PROGRAMME.

The Federal Government should encourage the staff of Natural Resources Conservation Council to undertake further trainings in areas such as population genetics, exploration, ecology, taxonomy, cell and tissue culture physiology and information science.

Nigeria University also should be encouraged to mount courses on conservation and utilization of plant genetic resources at the post-graduate levels, as obtained in Birmingham University, United Kingdom. Refresher courses on genetic resources exploration and conservation for at least six months for scientist should be recommended for all conservators in agricultural research institutes.

## A SEARCH FOR REMEDIES.

The success story of some developed countries like Japan, Germany, United States, India, Pakistan, Sri Lanka, Denmark, Norway, China and Soviet Union in agricultural production, reflects on their policy support for agricultural education and germplasm conservation. In most of the countries with major break through in food production, the goal of the governments to meet the requirements of a developed agricultural economy facilitated the enactment of appropriate government policies to support the effectiveness of genetic resources conservation. In general most of the governments undertook to

- a) Enacting specific legislation for agricultural education on gene conservation where such did not exist already.
- b) Incorporating genetic resources conservation as a component of National development planning in agriculture.
- c) Setting up appropriate mechanisms to initiate pre-service teacher training, conduct in-service training develop and conduct long-term research on backcrosses of wild and primitive plant forms with related food crops. From the above expenses, the government may consider the following policy options -

1. Inclusion of a dynamic policy on genetic resources conservation in the National Agricultural development plan for training of technically skilled personnel in germplasm collection who will assist in implementation of the government plans for self reliance in food production.

2. To formulate a research policy on effect of intermediate and personnel in genetic modification engineering in research institutes and universities.

3. To formulate policy on environmental impact assessment to be carried out on the available genetic resources of wild and primitive plants in any virgin forest land to be used for industrial purposes. Such endangered gene materials should be retrieved from such forests and fields for preservation and conservation.

4. To mandate all Universities and agricultural institutes to establish and maintain gene banks or pools of both wild, primitive and hybrid varieties in their institutions.

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