

Union internationale pour la conservation
de la nature et de ses ressources

International Union for Conservation
of Nature and Natural Resources



Le Président
The President

July 13, 1988.

My dear

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I shall be happy to help in any way you like in getting this proposal implemented speedily and effectively.

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Yours sincerely,

(M.S. Swaminathan)

Hon. Shri K. Natwar Singh,
Minister of State,
Ministry of External Affairs,
New Delhi.

Réponse à:/Reply to:

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PROPOSAL FOR THE ESTABLISHMENT OF A RICE RESEARCH
INSTITUTE IN KAMPUGHEA WITH FINANCIAL AND TECHNICAL
ASSISTANCE FROM THE GOVERNMENT OF INDIA

INTRODUCTION

Prior to 1969 Kampuchea was a net exporter of rice; annual exports of rice peaked at around half a million tons in the mid 1960s. Kampuchea today is a net importer of rice. In 1986, which by all accounts was a good year weather wise, rice imports amounted to half a million tons. Rice production in Kampuchea is currently at 60% of its 1969 levels in terms of area cultivated and output.

Advances in rice output have to be made in the face of binding constraints to the import of adequate quantities of chemical inputs (fertilizers, pesticides) and mechanical inputs (tractors, power tillers and pumps). Output growth is also constrained by the shortage of labour and draft animals. This is both a challenge and an opportunity for the development of the rice sector of Kampuchea - the challenge is in overcoming these constraints and the opportunity is in promoting technologies for sustainable agriculture from the start without having to face the period of unlearning that is inevitable in countries which have become accustomed to using high levels of chemical inputs.

Kampuchea has a population of approximately 7.5 million people. Currently, the cultivated rice area is approximately 1.8 million hectares. Prior to 1969 the wet season rice area was around 2.4 million hectares, this implies that the current unutilized capacity of rice land is around 600,000 hectares (this figure does not include areas that can be reclaimed). The major share of rice production comes from the Mekong Delta Provinces in the Southeast of the country (Kompong Cham, Kandal, Kompong Speu, Prey Veng, Takeo and Svay Rieng) and from the North Western province of Battambang. Between them these provinces account for 66% of the total production. To a large extent the share of rice production among the provinces matches the distribution of population, with the Mekong Delta Provinces being the most densely populated parts of the country.

The primary rice growing environments of Kampuchea are as follows :

- (a) rainfed
- (b) irrigated lowlands,
- (c) deepwater areas and
- (d) receding flood plain areas.

There is also a small upland rice area. Shallow and intermediate rainfed areas are by far the most important rice growing areas of the country.

Rice varieties grown currently fall into the following groups :

- (a) semi-seasonal or medium duration varieties which take between 4-6 months to mature, grown mainly on the shallow and intermediate rainfed areas;
- (b) seasonal varieties which take about six months to mature and are grown in the intermediate rainfed areas with capacity for supplementary irrigation;
- (c) long duration varieties which can take anywhere from 6 to 10 months to mature and are also grown in intermediate rainfed areas with assurance of supplementary irrigation;
- (d) Deepwater varieties are grown in areas which are covered with depths of 2 meters or more for long periods of time, these varieties can have durations of 6-10 months;
- (e) IR varieties, mainly IR 36, IR 42 are grown on shallow rainfed areas with good water control during the wet season, receding flood plain areas once the flood water recedes starting in November, and in irrigated areas during the dry season.

In 1986 the total area planted to rice was around 1.6 million hectares. Of this area 44% was planted to long duration varieties, 38% was planted to semi-seasonal and seasonal varieties, 8% was planted to deepwater varieties and 10% was planted to IR varieties. In 1966,

of the 2.5 million hectares under rice cultivation, 20% was planted to long duration varieties, 64% was planted to semi-seasonal and seasonal varieties and 16% was planted to deep water varieties. Why has there been such a dramatic fall in the area cultivated under semi-seasonal and seasonal varieties and in the area under deep water varieties, in each case current levels are half of what they were in 1966? In the case of deep water areas we know that several varieties were lost during the Pol Pot years since it was forbidden to grow deep water rice. In the case of semi-seasonal and seasonal varieties we can only hypothesize that over the centuries Kampuchean farmers developed several hundred varieties of semi-seasonal and seasonal rices which were adapted to and grown on particular locations for which they were well suited. During the forced population movement during the Pol Pot years many of these varieties were lost.

Priorities in rice research indicated by Hon. Hun Sen, President of the Council of Ministers during his meeting with Dr. M.S. Swaminathan

The Hon. Prime Minister Hun Sen indicated the following priority tasks :

- a. Increase in rice production is not commensurate with the growth in population. The annual growth rate in population may be as much as 3 percent and this will call for a 9 percent growth rate in the agriculture sector. Unfortunately, agricultural growth is practically stagnant due to climatic, economic and political factors.
- b. To increase production, a 3-pronged strategy should be developed.
 - i. Increase the area under cultivation based on scientific land use planning criteria; for this purpose, complete the preparation of the agro-ecological map; divide the land area into :
 - Intensification areas
 - Ecological restoration areasInterpret the satellite imagery into descriptive terms for use in land use planning.

- ii. Increase productivity per crop, using techniques which can help to achieve on a sustainable basis yield increase at as low cost as possible; substitute to the extent possible farm grown biological inputs for imported chemical inputs; identify localtion-specific varieties.
- iii. Increase the intensity of cropping through suitable multiple cropping sequences; only 10 percent of arable land is now under double cropping; identify suitable crops and varieties based on ecological and marketing considerations.
- c. Germplasm conservation is important. Seeds of floating and deep water varieties, particularly those collected from Kampong Chhnang provinceneed to be introduced again.
- d. Training both in India and in Kampuchea is vital.
- e. Kampuchea Rice Research Institute (KARRDI): This institute needs to be established as soon as possible. Rice holds the key to food security in Kampuchea.

The Prime Minister also expressed his gratitude to Prime Minister Rajiv Gandhi, Foreign Minister P.V. Narasimha Rao and Dr. G.V.K. Rao. He hoped that the Government of India will extend help in the establishment and development of the Kampuchea Rice Research and Development Institute.

Structure of the Institute

The proposed Rice Research Institute of Kampuchea should give high priority to the following areas of research :

1. Soil nutrient management - Within the next few years two million hectares of rice land will be under cultivation in Kampuchea. Given the stagnation of chemical fertiliser imports at 25,000 tons of urea and given the shortage of farmyard manure, research into alternative

system of maintaining soil fertility, such as green manures and legume-rice systems ought to be the top priority of the India-Kampuchea research programme.

2. Water management - A country wide assessment of existing and potential irrigation systems needs to be made to evaluate the current utilization of existing capacity and the returns to further irrigation investments. An assessment also needs to be made of the existing reservoirs and delivery systems in the flood plain areas in terms of their adequacy and possibilities for simple modifications in order to increase cropping intensities.
3. Varietal testing and improvement - The immediate priority is to help Kampuchean farmers re-match existing traditional varieties to the micro-environments for which they were adapted. This can be achieved through observation and screening trials of traditional varieties in several micro-environments. In addition, a dynamic rice breeding programme will have to be initiated.
4. Pest Management - Pesticide use is on the increase in Kampuchea especially in association with modern variety use. The India - Kampuchea programme has a unique opportunity to popularise Integrated Pest Management from the start. This can be done by providing training and awareness programmes at three levels : (i) at the senior government level; (ii) at the district official and extension agent level ; and (iii) at the farmer level. We should also examine the pest-predator complex in environments where traditional varieties are predominant and pesticides are not used. This would help in identifying the pest-predator relationships that could be emphasized in the IPM training materials and programmes.
5. Agricultural Engineering - Given the current and anticipated shortage of draft power we ought to examine the ways in which current draft power resources can be used more efficiently. This can be achieved by : (i) examining the yield-tillage trade-off in the different rice growing environments and on different soil types, with the objective of identifying

areas for the power saving minimum or zero tillage systems; (ii) examine current and alternative tillage tools in order to increase the efficiency of power use, for instance the switch from the scratch plow to the moldboard plow ought to be examined.

6. Agricultural Statistics: Improved procedures for the collection and management of National rice and other agricultural data ought to be examined. Improvements will involve: the use of satellite imagery and appropriate ground truth research; systematic sampling procedures for obtaining farm level information and the verification of sample survey information with data from crop cuts in appropriate locations. Improvements in the statistical data base would help in policy planning and research priority assessment.

7. Farming Systems Research: Kampuchea farmers practise mixed farming in many instances. It is necessary to design and launch a farming systems research and development programme in farmers' fields. The major components of such a programme will be :

- (a) Rice - Soybean or other crops
- (b) Rice - Livestock
- (c) Rice - Fish
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The combinations will have to be chosen according to the needs of the farming families and opportunities for marketing.

Implementation

Kampuchea has lost practically all its infrastructure for rice research. We should help in designing and constructing suitable laboratories for undertaking research in the areas mentioned earlier. We will also have to provide the necessary equipment. Also training programmes will have to be undertaken both in India and in Kampuchea. A few scientists will have to be deputed to work in Kampuchea for 2 to 3 years.

If the above proposal meets with the approval of the Government of India in principle I would suggest that a small team may be constituted to work out the proposal in greater detail and then visit Kampuchea for finalising the design of the Institute and technical programme of work for the next five years. Assistance in increasing and stabilising rice production in Kampuchea will be the most valuable form of collaboration in the field of Agriculture. This was also the major recommendation of the Government of India Team headed by Dr. G.V.K. Rao, which visited Kampuchea in January, 1982.

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