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DEVELOPMENT OF COASTAL POORLY DRAINED LANDS
FOR RICE CULTIVATION IN THE WET ZONE OF SRI LANKA

A Thesis

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by

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ABSTRACT

In the Wet Zone coastal lowlying lands, located within the most densely populated part of Sri Lanka, hitherto neither rice cultivation nor its diverse resource base has been systematically developed. The main constraints to rice production are sudden floodings, poor drainage, coastal salinity at elevations below +2.0' MSL (Mean Sea Level) and injurious soil conditions in localized areas within rice tracts.

The present paddy yields of 15-25 bushels/acre could be doubled or even trebled with currently available rice varieties and technology, provided improvements are made to the physical environment, through water control, and to the chemical environment.

Low available phosphorus appears to be the main nutrient problem limiting rice yields, particularly on organic soils. However, the three major nutrients (NPK) need to be applied together, even in sub-optimal quantities. Silica application might be beneficial. Sources of nitrogen other than urea, such as ammonium chloride and ammonium nitrate, the latter on soils where "Bronzing" occurs, need to be investigated. Iron and hydrogen sulphide toxicity occur in scattered pockets, the former mainly on mineral soils and the latter predominantly on highly reduced organic soils.

Erratic rainfall distribution requires the use of supplementary irrigation for stabilizing yields. Moreover, the optimum utilization of organic soils, both non-pyritic and pyritic, requires a good water supply and control to prevent soil drying and consequent subsidence, salinization and acidification, the latter in pyritic soils.

Five major cropping systems, using photoperiod-sensitive and photoperiod-nonsensitive rice varieties of short, medium and long duration have been identified. Production increases pivot on higher productivity from these cropping systems rather than changes in the cropping pattern, as the latter is an adaptation to the macro-environment which cannot be changed. This requires improved rice varieties of varying duration - photoperiod-sensitive and nonsensitive, with adaptability to adverse environmental conditions, pest and disease resistance and moderate yield potential (i.e. 50-80 bushels/acre, nett yield) with low levels of chemical inputs.

The small size of holdings and a high risk factor make it imperative to develop alternate sources of on- or off-farm income support for rice farmers. A central hypothesis in this thesis is that the improvement of the socio-economic conditions of coastal small rice farmers, on a sustained basis, would depend on alternate sources of income rather than rice cultivation alone. The diverse resource base in the area, particularly the potential for developing fisheries, aquaculture, horticulture and small animal livestock husbandry, provide ample opportunity for generating supplementary income. Therefore, the development strategy should be an integrated development and management of the entire resource base with the main focus on rice cultivation, the latter particularly on lands above +1' MSL. The rice development programme is best implemented as a three stage programme, with priority given to lands above +1' MSL where rice is already extensively cultivated.

The development model should be individual drainage and

reclamation schemes catering to location specific environments, resource bases and farmer needs. This requires an organization model with establishment of District Lowlying Lands Development Committees for monitoring and coordinating the multiple resource development programmes at the district level and a National Lowlying Lands Development Authority for overall responsibility and coordination. Moreover, the multidisciplinary team strategy is most appropriate for dealing with the diverse and complex problems of developing the Wet Zone coastal Lowlying Lands.

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