Studies in the Economics of Agricultural Development

Development Studies Centre

Thesis Abstracts No.2
Masters Degree in Agricultural
Development Economics

Studies in the Economics of Agricultural Development

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The Australian National University
Canberra 1979

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Introduction

The Masters Degree programme in Agricultural Development
Economics (M.A.D.E.) at the Australian National University
was offered for the first time in 1972 in response to a
suggestion from senior agricultural researchers in Sri Lanka.
The programme is focused on young administrators, research
workers, academics and extension officers concerned with
agricultural development in Asia, the Pacific and certain
other areas.   It aims to provide individuals who already
have suitable basic degrees with postgraduate education
useful to them in tackling the economic problems of
agricultural development.

    The programme involves one academic year of coursework
on the role of agriculture in the process of structural
transformation, the economics of agricultural production,
marketing, trade and policy-making, and in econometric
analysis, planning and budgeting techniques and computer
programming.   Work on a thesis starts in parallel with the
coursework but, following successful completion of the first
two semesters, students work fulltime on their thesis over a
period of about six months.

    In anticipation of the considerable weight given to the
thesis many of the students bring original data from their
home countries.   Much of this data is not readily available
elsewhere.   Thus their thesis represent an important body
of completed research work.

    The purpose of the publication of these abstracts is to
inform scholars as to the basic coverage of the studies
since, with few exceptions, the studies themselves are
limited to a few library copies.   The exceptions are the
theses of relatively wide appeal which have been published.
Information on these can be obtained from the Development
Studies Centre and are listed on page 57.

    The range of topics, methods of analysis, and geographical
location is extremely wide: in the thirty-one theses
presented in Volume I it ranged from optimal replacement

policies of perennial crops in Sri Lanka and Indonesia, to
credit requirements of sugar farmers in Fiji, to simulation
studies of farm budgets for land settlement in Sumatra and
water pump irrigation in the Philippines, and rural-urban
irrigation in Kenya.   Other studies cover aspects of
agricultural policy in South Korea, the Philippines and
Thailand; farmers associations and processing cooperatives
in Malaysia and Kenya; land reform in Ethiopia and the
technical efficiency of farmers in Nepal (see page 57).

In this volume the following topics are presented:
analysis of rural development planning strategies in Western
Samoa, Indonesia, Nepal and Ghana; fertilizer response and
distribution studies in Indonesia and Sri Lanka; economics
of high yielding seed varieties in Bangladesh and the
Philippines; project evaluation studies for small farms in
the Philippines, Papua New Guinea and Ghana; production
function analysis in peasant farming in Sri Lanka and Kenya;
demand and supply studies for agricultural products in Sri
Lanka and Thailand; institutional aspects of marketing and
credit in Malaysia and Thailand; applications of linear
programming and simulation techniques to annual and perennial
crop farming systems in Western Samoa and India; trade and
welfare aspects in Nepal and Indonesia; and socio-economic
factors affecting productivity in farming in several
countries.

The preparation of the forty-four theses represented in
this volume has involved long hours of work not only by the
students themselves, but also by their supervisors who were
drawn from the large body of scholars in Canberra within and
without the University.   The supervisors from the C.S.I.R.O.,
the Bureau of Agricultural Economics, the Industries Assist-
ance Commission and various Research Schools within the
University go unsung by name here but their efforts and
friendship are well appreciated by all the students con-
cerned.   In a similar manner the burden of typing and
administrating the actual production of the final thesis has
fallen to a small but dedicated staff.

Dan M. Etherington   and   Bridget Boucher (Editors)

Index of Students

This index contains the names of students who have received their Masters degree in this programme, the year they completed their studies, together with their prior qualifications and their present work addresses.

Index of Countries
Studied

Leung Wai, Sam

*Problems of Transition in a Dual Economy: The Case
of Western Samoa*

251pp. 32 tab. 16 fig.

This study attempts to explain, with the help of some models,
the structural transformation taking place within the
economic system of Western Samoa, the interaction of the
relevant sectors, and the implications for development at
the macro-economic level.   It is also concerned with an
analysis of subsistence and commercial activities of farm
families and the context within which they operate in
Western Samoa.

    An analysis of the economic system of Western Samoa
reveals that economic dualism exists, on two levels.   At
the macro-economic level a distinction is made between the
modern monetary sector and the traditional village
agricultural sector based on the differences in the con-
ditions of production and distribution within each sector.
At the macro-economic level the demarcation of economic
dualism is based on the existence, concurrently, of monetary
and non-monetary (or subsistence) activities undertaken by
subsistence-commercial family farms within the traditional
economy.

    The Samoan traditional society and the Samoan
traditional economy which operates within the context of the
traditional society are then described.   The productive
resources, subsistence and market production, and the
development and encouragement of production for the market
by the Government and the response by the farmers to such
efforts are discussed.   The effects of social organizational
institutions on production are then considered along with
the subsistence and monetary components of rural household
incomes.   The development of the various sub-sectors
within the monetary economy, and the government's policies
for their advancement are reviewed.

The Lewis model is presented and then used, with modifications of certain of its assumptions, to explain the structural transformation of Western Samoa's economic system and the interactions of the traditional and the monetary economies at the macro-economic level. Models by Fisk and Nakajima are used to analyse the process of transition from subsistence to commercial activities by subsistence-commercial farm families, after suitably defining what constitutes a farm family and a family farm in Western Samoa. Implications for development policy are considered.

The connection between structural transformation of the economic system and food shortages is established. The primary cause of food shortages is traced to the accelerated shift of labour out of the traditional into the monetary economies, a process which is exacerbated by rising emigration abroad. The need for Western Samoa to produce its own food requirements is justified. The production and marketing structure of staple foods is analysed, specific problems identified and suggestions towards a solution of staple food shortages discussed.

It is concluded that the present commodity-specific and country-wide indiscriminate extension and development approach by the Department of Agriculture should be replaced with a whole-farm approach which aims at maximizing the utility of family farms, given their resources and the amount of assistance forthcoming from the Government. Such an approach will lead to a better assessment of the resource-endowment of a farm (a village or a district) which presages the development of specialization as one of the ways by which productivity of both land and labour can be raised.

Thesis Abstracts 1976

Almeda, Juanita P.

Economies of Size in Rice Production in Two Selected Provinces, Philippines, Crop Year 1974-1975

86pp. 22 tab. 7 fig.

Agricultural development programmes in the Philippines give priority to increased rice production because of the contribution of this crop to the nation's food requirements and the economy in general. For this study, data obtained from a survey of rice farms in Bulacan and Laguna provinces, for the crop year 1974-75, are used to test for the existence of economies of size in rice production, and to test the efficiency of using improved rice varieties. Average cost curves are estimated using ordinary least squares regression, with both output and area as measures of farm size.

   The results show that substantial economies of size exist at least for farms producing up to 150-180 cavans, or with a cultivated area of about 30 hectares. The farm size goal for the current Land Reform Program, at 3.0 hectares for irrigated farms, is consistent with these results.

   Differences in the average cost of obtaining a given level of output between different provinces, semesters and varieties, are attributed largely to variations in yield and can be summarized as follows:

   (i)   unit costs for Laguna are below those for Bulacan;

   (ii)   the average costs for Bulacan rice farms are
          lower in the wet season but for Laguna are
          lower in the dry season;

   (iii) improved varieties produce at lower cost for
          output levels up to 120 cavans.   Thereafter
          local varieties produce at lower cost.

   Many of the sample farms produce below 60 to 100 cavans and hence there appears to be potential for economies of

size to be realized.   Farmers should therefore be encouraged
to increase their output and/or area to take advantage of
this potential.   If the use of improved varieties is to be
promoted however, the risk and uncertainty associated with
their use must be reduced through the improvement of
irrigation facilities and the provision of extension
services to assist farmers in their management.   Although
the current efforts by the government to increase rice
production recognize these needs, the results of this study
indicate that such efforts may have to be intensified.

Asnawi, Sjofjan

*Rural Development Planning Strategies For The Province of
West Sumatra of Indonesia*

212pp. 16 tab. 20 fig.

This study attempts to find relevant strategies of rural
development planning for the province of West Sumatra,
Indonesia, by using the theory, international experience,
and present conditions of the province as tools of analysis.

   A discussion of the basic concept of rural development
includes the definition of the rural development planning
strategy; the distinctions between agricultural and rural
development; and goals, elements, stages and phases of
rural development.   This shows clearly that the process of
rural development is an extremely complex and complicated
matter.   The main function of planning is to help rather
than to hinder the development process.   Without planning,
the process might be slow or misdirected.

   Some types of rural development strategies include: the
Minimum Package Strategy, Comprehensive Approaches, and the
Sector and Special Schemes.   The experience of many
developing countries in using these strategies is discussed.
It includes the experiences of China and Taiwan and the
comprehensive approaches, Malaysia with the 'Redbook'
planning procedure, Ethiopia with the Minimum Package
Program and the Chilalo Agricultural Development Unit
project, Kenya with the Kenya Tea Development Authority
programme, Bangladesh with the Comilla Projects, and
Indonesia with the programme of Rice Intensification,
Project Management Unit, of rubber, Village and District
Subsidy, and a number of Special and Sectoral programmes.

To complete the tools of analysis the conditions and potential of the province are then outlined. Major attention is given to the economic and social problems with respect to rural development.

The analysis includes a general model for achieving rural development goals; planning approaches; planning systems; and relative priorities in planning. A number of recommendations are also made.

The general model for achieving a self-sustaining rural development, as described by Waterson (1975), is likely to be relevant to the province. Although the comprehensive strategy is very important and quite reasonable for success, for the present conditions of the province it can only be seen as a long term planning objective. Various preparations are suggested for using the strategy.

Suggestions are made for improving the present strategies to make them more effective and to increase the participation of the local community. It is recommended that a two-way traffic planning procedure should be launched, in which proposals come from rural people, while guidance, consideration and decisions are made at the top by the government. The establishment of a rural development training institution to provide various aspects of rural development training for public servants and rural people should be considered by the Government. Upgrading courses for village heads and informal leaders should be continued in a regular manner to speed up the social process in the province.

de Silva, Nanayakkara Talpe Merenchige Hemasiri

Fertilizer Response in Coconut: Analysis Incorporating Temporal Effects

85pp. 20 tab. 22 fig.

The coconut industry occupies a position of great importance in the economy of Sri Lanka. The production of coconut can be increased by both long term and short term methods. These are (i) replacement of existing low yielding palms by high yielding varieties and (ii) improvement of existing palms by adequate fertilization and better maintenance.

Complex problems arise in proper economic evaluation of

the optimal fertilizer policies to be pursued in the industry
due to the variety of socio-economic as well as agronomic
factors that are encountered.   Such policies are however
extremely necessary in view of the costs associated with fer-
tilizer usage on the one hand and the need to expand coconut
production on the other hand in the present economic circum-
stances of Sri Lanka.

   The present study concentrates on the analysis of a set
of experimental data on response to fertilizer of coconut
obtained from an experiment conducted by the Coconut Research
Institute of Sri Lanka, from 1935-1965.   Some limitations
of earlier analysis of this data by others are discussed,
and an attempt is made to incorporate other relevant factors
including temporal effects into the analysis.

   The manner in which factors such as response lag,
nutrient carry-over in the soil and plant tissues, change in
response with ageing etc.   that are important in nutrient
response of perennial crops should be incorporated into the
analysis is discussed.   The importance of collection of
data on these factors in future experiments is stressed and
some possible methods of incorporating these factors in the
analysis when only weak data are available is discussed.

   Yielding patterns of palms over the period of the ex-
periment under different nutrient combinations are studied.
It is observed that under a majority of treatments, the time
trend of the yields takes a U-shape.   The reason for such
a shape is investigated and it is observed that the change
in potassium level in 1950 cannot completely explain this.
Possible explanations and their implications for policy are
discussed.

Gyawali, Saroj K.

Rural Unemployment in Nepal: The Chitawan Valley Experience

200pp. 58 tab.

The main aim of this study is to investigate the problem of
rural unemployment in developing countries with special
reference to the Chitawan Valley (Nepal) experience.   A
brief review of the existing literature relating to the
theoretical framework on the subject is undertaken first.
This is followed by the required background information on
Nepal.

The general hypothesis posulated is that the valley, initiated as a resettlement area nearly a quarter of a century ago, was rapidly heading towards a labour surplus stage.

Extreme inter and intra farm heterogeneity in the sample with respect to resource availability and input application necessitated the adoption of a synthetic farm approach. Farm size, land type and level of technology were considered to be the main criteria around which the synthetic farms were constructed. Various methodologies of measuring employment were discussed and the 'labour available versus labour required' variant of the 'labour utilization approach' was used. Accordingly, the labour utilization rate was computed for each farm situation by comparing the labour employed (given by Leontief type fixed labour input coefficients) with the annual regular labour available. Given the small size of the sample (55 farming households) the application of the powerful non-parametric test was deemed effective to check the validity of the results.

The analyses undertaken indicate the prevalance of under-employment in all the farm situations considered. Unemployment was generally identified as being only seasonal in nature and was concentrated during the winter months. The observed unemployment was at least, in part, attributed to the monsoonal pattern of agriculture. Hence, promoting employment through irrigation development seems to be advisable.

In terms of average physical product of labour, under-employment was particularly serious among the small farms. Output maximization being the driving force in the small farm situation where household labour was in excess in relation to the available land resources, the unpaid family labour was lavishly utilized. Lack of access to land, therefore, appeared to be a major cause of unemployment in small farms. Work opportunity outside the family farm was also limited due to factors such as underutilization of land in large farms, coincidence of demand for extra labour during peak seasons and socio-cultural barriers to hire out family labour.

Improved biological-chemical technology increased labour intensity in farming due to high cultivation standards of new seeds. Since by definition mechanization means increasing

the capital component, this aspect could hardly be ignored
in the present study.   Use of tractors displaced human (and
animal) labour at land preparation.   A combination of seed-
fertilizer technology and mechanical technology of land
augmenting type, the former by increasing labour requirement
per hectare and the latter by increasing the area under
cultivation,had the effect of promoting employment of both
family and hired labour.

   Possible courses of action suggested were varied and
included measures such as land redistribution, water
management provisions, change in cropping systems and easy
access to farm credit and inputs.

Honu, Bright

*Economic Interactions in Ghana: A Study of Sectoral
Interdependence and Linkages*

87pp. 29 tab.

This thesis examines the background to development planning
in Ghana, and the interactions between sectors of the
economy, with special reference to the primary sectors.
It makes use of the official input-output (I-O) table to
identify the type of interactions that existed within the
Ghanaian economy in 1968.   Input-output analyses have been
in use for development planning and research for a long
time, but very little use has been made of the Ghanaian I-O
table since it was published in October, 1973.

   The findings of this paper are not to be regarded as
final, but as providing a basis for looking at major
problems of the economy (e.g. low incomes, high unemployment
and growth as a whole) on a national basis rather than from
the viewpoint of industrial projects.

   The introduction deals with the measurement of economic
performance and the various approaches to economic
development; this is followed by the historical background
to economic development planning in Ghana.   Aspects of the
Ghanaian economy are briefly compared with those of some
other developing countries.

   Theoretical aspects of input-output analysis are intro-
duced followed by a brief discussion of the official

Ghanaian I-O table, how it was compiled, and some of its deficiencies.

The I-O approach is used to identify various linkage effects in the economy in 1968.

The thesis concludes with a section which incorporates suggestions for improving the current Ghanaian I-O table for use in development planning.

Mahmood, Muhammad

The Diffusion of High Yielding Varieties of Rice in Bangladesh

120pp. 20 tab.

In the face of a chronic food grain shortage, the Government of Bangladesh has, since the late sixties, been trying to increase the domestic production of rice by introducing HYV rice. The First Five Year Plan (1973-78) of Bangladesh spelled out that by the terminal year, the country would be made self-sufficient in food grain production with the help of HYV rice. As it has turned out, the rate of adoption of HYV rice is much slower than anticipated. The rice self-sufficiency program depends on how rapidly HYV rice is being diffused by the farmers.

In this study, an effort has been made to look into the diffusion process of HYV rice in Bangladesh. Both the tabular and graphic surveys of data show diffusion to be at an early stage. Multiple regression has been used to isolate the factors which are important at the early stage of diffusion. Within the model we also tried to test for the relative importance of the various factors in the process.

It has been shown that the dissemination of information, along with improved availability of supplementary inputs like fertilizer, is likely to accelerate the rate of diffusion at the early stage.

On the basis of the results obtained, conclusions were drawn about how the rate of diffusion can be accelerated by government policy changes.

Sjafradji, Saleh

The Economic Aspects of Fertilizer Distribution in East Java (Indonesia)

90pp. 3 tab. 1 fig.

Self-sufficiency in rice production was set as a policy goal in the First Five Year Plan of Indonesia, 1969-1973 (REPELITA I).   Incentives to increase rice production are not provided by increasing the price of rice, since the Indonesian Government believes that this would have a de-stabilising effect on the economy as a whole.   Instead, farmers are encouraged to increase rice production through the subsidisation of input prices, particularly manufactured fertilizer prices, under the Bimas/Inmas scheme.

   However, the subsidised price for fertilizer distributed to Bimas/Inmas farmers creates a dualistic market for fertilizer and results in leakages from the official net-work to private distribution channels.   In turn, this reduces the quantity of fertilizer which rice farmers receive at the subsidised price.   The low distribution margins for the official network also discourage distribution services and hence reduce the flow of fertilizer with respect to both amount and timing of delivery.   Thus it would appear that official distribution faces conflict in objectives: efforts to reduce the costs of fertilizer for Bimas-Inmas farmers and distributors tend to reduce or delay the quantity of fertilizer reaching the participants in the intensification schemes.

   The advantage to Bimas farmers of credit subsidisation may also be offset by various inefficiencies of the official distribution network, particularly with respect to pro-cedural difficulties encountered in obtaining credit.

   This study examines the nature and problems of fertilizer distribution through official and private networks and pro-poses various hypotheses which can be tested to judge and compare the efficiency of these networks.   The information required to test such hypotheses will be collected following the final draft of this dissertation.

Taib, Abu Bakar

*Socio-Economic Factors Affecting Rice Farm Productivities:
The Krian Irrigation Scheme, Malaysia*

162pp. 41 tab. 8 fig.

This study attempts to provide a better understanding of
factors affecting rice farm productivities in the Krian
rice growing area. It also supplies additional material
for the regional study of one of the oldest irrigation
schemes in Malaysia.

   The application of multiple regression analysis to sample
cross-section input-output data resulted in the explanation
of a statistically significant percentage of variation in
gross padi production. Conventional analysis merely makes
statements of management effects. The differences between
average and frontier production function underscores
differences in managerial ability of farmers operating on
the frontier compared to those operating on the outer bound.
This analysis takes cognizance of management effects by way
of management entered as explicit variables. The
theoretical consideration therefore means that average and
frontier functions are the same; any differences that exist
are due to differences in management ability and random
disturbances. The inclusion of management ability
marginally improved the fit of the Cobb-Douglas function.
Significant and substantial resource productivity differences
were found between management groups. As such, extension-
induced technical change to increase farm output is likely
to widen this gap and accelerate the degree of relative
performance, given the existing technique of the extension
programme. Extension strategies and programmes therefore
must take cognizance of this fact. The reluctant adopters
of modern technology must not be neglected in favour of the
much more advanced adopters.

   The recognition should also be given to land, soil and
irrigation quality which contribute the major share of the
explanation in variation. The strategy therefore is to
identify areas where productivity can be increased.
Fertilizer and management ability factors seems the obvious
choice. Research needs to be conducted to further improve
fertilizer productivity. Extension strategies developed
should likewise aim at improving the management ability of
all farmers, with special attention given to the less modern

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farmers.   Religious, social and other economic factors must
also be analysed to provide a general framework of under-
standing of factors apart from those already discussed.

Teo   Choo-Kian

*Production Function Analysis of Small Rubber Farms in Sri
Lanka*

143pp. 22 tab. 30 fig.

The main purpose of this study has been to estimate the Cobb-
Douglas production function from the cross-section input-
output data of small rubber farms in the Agalawatta district
of Sri Lanka.   Twelve factors of production believed to
affect output of rubber were identified, out of which four
factors, namely, planting density, farm size, tapping
frequency, and tapping age of the trees, were considered in
the estimating equation.   The function was estimated for
clone PB86 and clone Tjir 1 separately; and for each clone,
the Cobb-Douglas function was estimated by two different
techniques, namely, the Ordinary Least Squares method which
estimates the average function, and the Linear Programming
method which estimates the best or the frontier function.

   As a first step in the analysis, simple correlation and
simple regression methods were employed with a view to
bringing out relationships between each of the specific
factors and the output per acre.   Next, the relationship
between the four factors of production and the output of
rubber was examined within the framework of multiple re-
gression analysis.

   The estimated coefficients were used to predict output
per acre for each clone.   For both clones, the results
strongly suggested that for every farm or group of farms for
every year or group of years, there is a separate yield
curve.   Instead of a single production function, there
exists a family of functions depicting various efficiency
levels.

   For both clones, the estimated coefficients of the
frontier function indicated that the frontier had shifted
non-neutrally upward from the average function.

   Vectors of technical efficiency relative to the average

and relative to the frontier were generated.   The results showed that there existed a wide range of technical efficiency at farm level.   This big difference in efficiency could be due to soil quality, management, or even be due to errors of measurement in the variables used for the production function analysis.   It is clear that further research is needed to clarify the true meaning of these 'efficiency' indices as applied to the rubber smallholders.

When the efficiency ratings from the average and the frontier functions were compared, it was found that the ranking of the farms were similar irrespective of whether the ratings were calculated relative to the average or to the frontier function.

Marginal returns to factors of production for individual farms revealed that there was no significant relationship between farm size and the marginal returns to the land. Under the assumption of perfect markets, and assuming that the price of rubber was Rs. 1.00 per pound and the average wage rate was Rs. 5.00 per day, it was found that for PB86 farms, the majority of the smaller farms had overused the tapping labour, and nearly all the larger farms had under-utilized this input; for Tjir 1 farms, all the smaller farms and about 50 per cent of the larger farms had overused the tapping labour, and underutilization of tapping labour occurred only in the larger farms.   Underutilization of labour in larger farms, which were thought to be held by absentee landlords, could be due to a shortage of labour or an unattractive nature of the share-arrangement or the wage-payment.

Since there were substantial amounts of non-rubber crops such as paddy, coconut and tea in the area, it may have been a mistake to ignore these crops in an economic survey and to obtain information relating only to rubber.   Hence, great caution is needed when using the analysis from such a survey to give any crop-specific advice because the information could be quite irrelevant in a mixed enterprise situation.

Yalong, Elpidio L.

*The Piggery Contract Growing Scheme in the Philippines:
A Study on Cost-Benefit*

148pp. 29 tab. 7 fig.

This study evaluates the profitability of a piggery contract
growing agreement in the Philippines.   The assessments are
made from the owner's, growers', and social viewpoints.

   Following a discussion of the swine industry and a
piggery contract growing agreement in the Philippines, the
analytical framework is set out.   This involves a dis-
cussion of cost-benefit analysis, sensitivity analysis, and
evaluation criteria.   Investment criteria, choices of
discount rate, and the derivation of the cash flow are also
discussed.   The investment criteria used are the internal
rate of return, net present value, benefit to cost ratio,
net present value to investment ratio, and average yearly
present value of net benefits.   The first four criteria
are used in ranking the project from the owner's and social
viewpoints.   All five criteria are used in assessing the
profitability of the project from the growers' viewpoint,
with emphasis given to the last criterion (i.e., average
yearly present value of net benefits).

   The costs relevant to the owner and to the growers are
then dealt with.   For the owner, three situations are
examined: no contracting of pigs to growers (0 per cent
contract growing scheme); contracting 60 per cent of pigs
owned to growers (60 per cent scheme), and contracting 100
per cent of pigs owned to growers (100 per cent scheme).
The cash flows for each of these schemes are presented.
For the growers, the cash flow for raising 100 pigs is
presented.

   Following this, costs are adjusted to reflect the value of
the piggery contract growing schemes to society.   Some of
the cost components are shadow priced to reflect their
relative scarcities and some of them are treated as transfer
costs.   Decomposition and adjustment of capital outlay and
current cost items into unskilled labour, foreign exchange,
and taxes are also discussed.   No adjustment is made to the
benefits.

   Finally an economic appraisal is undertaken.   This in-
volves the presentation and discussion of the results

obtained and the conclusions and recommendations based upon
them.   The cost-benefit analyses reveal:

(1)   that the 60 per cent and 100 per cent contract
        growing schemes are more remunerative to the
        owner than no contracting;

(2)   that all schemes are highly profitable socially
        as proven by internal rates of return of more than
        30 per cent.   The 60 per cent and 100 per cent
        schemes are more remunerative than no contract
        growing;

(3)   that the growers earn an average yearly present
        value of net benefits of about P2,700 (P500
        more than the minimum wage of P2,200) raising
        100 pigs at a time.

On the other hand, the sensitivity analyses show that:

(1)   The 60 per cent and 100 per cent schemes remain
        more remunerative to the owner than no contracting,
        assuming changes in the opportunity cost of
        capital by plus or minus three percentage points.
        The rankings of the schemes, however, are affected
        by reducing the number of pigs per grower.   For
        25 or 50 pigs per grower, the 60 per cent scheme
        was most remunerative, followed by the 0 per cent
        and then by the 100 per cent schemes.
        Assumptions of a 10 per cent reduction on the
        prices of pigs or a 10 per cent increase on the
        prices of feeds prove to be disastrous to the
        owner.   These sets of assumptions fail to pass
        any of the adopted investment criteria.

(2)   From the social viewpoint, the order of results
        achieved is not greatly dependent on the
        assumptions made about the social opportunity
        costs of unskilled labour, exchange rate, and
        capital.   The assumption made about the number
        of pigs per grower does not greatly affect the
        order of results regarding social returns to
        capital, but does greatly affect the order of
        results regarding employment.

(3)   For the growers, assumptions of 1 per cent more
        mortality than allowed, or a change of the

opportunity cost of capital by plus or minus
three percentage points, are still more
remunerative than being labourers.   Assumptions
of 2 per cent more mortality than allowed, or a
penalty for underweight pigs, or raising 25 or 50
pigs at a time, prove to be less remunerative.

Based on the results obtained, several measures may be
suggested in order to encourage piggery contract growing in
the Philippines:

(1)   a stabilization subsidy to counteract the
      disastrous effect of a reduction in the
      prices of pigs or an increase in the prices of
      feeds;

(2)   veterinarians from the Philippine Bureau of
      Animal Industry to provide professional services
      free of charge to the scheme;

(3)   a change in the basis for providing credit;

(4)   creation of an insurance market for the scheme.

These measures would not be costless, but in view of the
high potential social returns to piggery contract growing,
they may be justified.   However, they would require a
cost-benefit study in their own right.

Thesis Abstracts 1977

Adl, Ali Reza

Estimation of Demand for Tea and Coffee in Australia

87pp. 7 tab.

This study attempts to review the basic principles of the consumer demand theory in order to estimate the demand for tea and coffee in Australia.   Generally the study of consumer demand theory is important because it can be used in development and production planning.

Some of the commonly used systems of demand equations for empirical studies are explained.   The study also attempts to explain a habit formation hypothesis and incorporate the hypothesis in the systems of demand equations.   On this basis, three models of demand equations with and without habit formation are used to estimate the demand for tea and coffee in Australia.

It is shown that none of the models satisfy all the general restrictions imposed on demand equations, since each one has some advantages and some disadvantages.   However, through the comparison of these models it is shown that a habit formation model is justified.   Tea in the Australian consumption pattern is an inferior good while coffee is a normal commodity.   On the basis of the alternative functional forms, it seems that the double logarithmic system is a better model for estimating the demand for a single commodity such as tea or coffee.

Amin, Mohiuddin Zahur

Financing Bankable Projects for Small Farmers: The Bangladesh Perspective

157pp. 28 tab. 11 fig.

Since national independence in 1947, when the colonial areas now forming the present Bangladesh were freed to become East Pakistan, a number of approaches for augmenting agricultural

output and income have been attempted.   The present study
examines such an approach, styled 'The Bankable Area
Development Project', which is currently being advocated for
the development of selected areas with agricultural
potential.

   Cross-section data for one year of a proposed pilot
bankable project have been analysed to measure benefits,
costs, and net benefits without the project for each group
of small farmers.   Based on farm level information, one
average annual farm plan with power irrigation and the other
without it have been projected for each farm group to
measure the incremental benefits, incremental costs, and
incremental net benefits with the project.   These data have
been considered with other relevant information in the
financial analysis of the project.

   The study shows that all the farm groups would be
financially viable with power irrigation accompanied with
credit and inputs, as the IRR for each of them would be
impressive, i.e. more than 50 per cent, and the BCR would
range from 1.09:1 to 1.29:1.   Without power irrigation,
on the other hand, financial viability for all the farm
groups would be on a much lower key.   Their IRRs would
range between 16 per cent and more than 50 per cent, but
their BCRs would be between 1.01:1 and 1.15:1 only.

   It is also revealed from the study that the BCR and the
IRR for the project with power irrigation is very impressive,
i.e. 1.58:1, and more than 50 per cent respectively.   Even
with a 10 per cent cost escalation and a simultaneous 10
per cent reduction in benefits the IRR would remain a
significant 44 per cent.   The financing bank's BCR is
1.04:1 and IRR 18 per cent, both of which are financially
encouraging.   However, with the 10 per cent overrun in
costs and decrease in benefits, the IRR would fall sharply
to an alarming 4 per cent only.

   Hence, the broad conclusion from this study is that
bankable area development projects for small farmers in
Bangladesh would demonstrate high financial viability, if
the various enterprise and activity programmes are carried
out as per appropriate and viable farm plans.   To ensure
viability of the financing bank, the credit programme should
be invariably tied with the supervised utilization of inputs
and extension, and the rigorous enforcement of credit
discipline.

Badrun

The Economic Aspect of Cattle Development in West Nusa Tenggara

119pp. 21 tab. 5 fig.

The importance of cattle development in West Nusa Tenggara lies not only in producing cattle for local meat consumption and draught animals but also in catering for the needs of the deficit regions in Indonesia and for exports to overseas markets.

Consequently, the starting point was a review and assessment of production capabilities, particularly in the rate of cattle population growth, the level of meat production and feeding management. A projection of cattle population and meat production to the end of the Second Five Year Development Plan was undertaken.

Secondly, an attempt was made to estimate the meat demand relationship for domestic consumption and the demand for cattle in the Hong Kong market. Thirdly, the existing cattle marketing system was discussed and suitable suggestions have been made to improve its structure and functioning.

Finally, this study utilized a spatial equilibrium model which allows for the interaction between demand and supply forces as well as price levels in the different regions in Indonesia and overseas markets, with the objective of maximizing total revenue from meat trading in domestic and overseas markets.

Brunton, P. Desmond

The Evaluation of Agricultural Loans: A Case Study of Development Bank Financed Cattle Projects in the Markham Valley of Papua New Guinea

157pp. 22 tab. 10 fig.

This study is concerned with developing a system of loan evaluation for use by a development bank, focussing on the extent to which the loan recipients experienced improvement

in their financial position.   It is suggested that such
financial improvement is a necessary condition for the
success of any credit program.

   The evaluation system developed uses the 'owner's' net
present value or work as the decision criterion to judge
whether financial success had, in fact, occurred.   Fourteen
small-scale beef cattle farmers, operating in the Markham
Valley of Papua New Guinea, and financed by the Papua New
Guinea Development Bank, were used as cases to test the
adequacy of the system and the criterion used.

   The major conclusion of this study is that the net present
value criterion is adequate as a definitive measure of
financial improvement.   It incorporates the time value of
money, is relatively simple to apply and is able to take
into consideration particular constraints (e.g., a minimum
income constraint) facing the entity for which the analysis
is being performed.   It is also capable of incorporating
the different time preference rates (and risk return pre-
ferences) of different individuals by reflecting these
differences in the discount rate chosen.   Finally, the net
present value is a valid maximizing objective, thus
improving its usefulness as an evaluation criterion.

Burgess, Richard John

*The Intercropping of Smallholder Coconuts in Western
Samoa: An Analysis Using Multi-Stage Linear Programming*

259pp. 34 tab. 13 fig.

The village agricultural sector of Western Samoa holds a key
position in the country's economy, commanding the majority
of the productive resources and providing a large proportion
of export earnings.   Present trends however show declining
export earnings and an exodus of younger males from village
agriculture into wage employment in Apia and through
migration to New Zealand.   Trends are seen to reflect
declining returns per manday in traditional production
systems.   A modern systematic intercropping system is
investigated as to its technical and economic feasibility as
a means of providing rural family cash income requirements
in competition with alternative sources.

   The technical basis of intercropping is established

prior to detailing individual crop yield, price and input
parameters.   Cash flows obtained were compared on returns
to labour.   To obtain an optimal combination of coconuts
and intercrops from an economic standpoint, alternative
programming techniques were considered and multi-stage linear
programming adopted.   This permitted adequate modelling of
the intercropping system's inter-relationships and optimis-
ation of the system over the life-cycle of the coconut
stand.

   The model maximised the present value of cash surpluses,
which represented the return to labour.   It allowed a
portion of family labour to be allocated competitively
between wage and on-farm employment.   Financing of the
cash deficits during perennial crop establishment was
through loans or cash transfers.

   Medium to high planting densities for coconut were
optimal for the intercropping system adopted.   Pineapple
and cocoa were the dominant intercrops.   An increasing
portion of family labour in wage employment was drawn on for
land resource increments above four hectares up to full
utilisation at approximately eight hectares.   Higher rates
of time preference reduced the total area established.
Cash surpluses above a basic family living requirement
barely met the level obtainable in alternative employment
in the first half of the coconut life cycle but were sub-
stantially higher thereafter.   Attention needs to be
directed to the present non-intercropping phase to improve
the economic attractiveness of the system.   Further
analysis is required of shorter segments of the system to
establish within-period cash flow financing requirements.

   The intercropping system is regarded as capable of
making a valuable contribution to rural family livelihood
and of having a substantial impact on the overall economy.

Gunawardena, Pemasiri Jayasekara

*Towards the Estimation of Demand and Supply Functions for
Vegetables in Sri Lanka*

103pp. 21 tab. 2 fig.

Vegetables occupy an important place in domestic food
production and consumption in Sri Lanka.   However, the

performance of the vegetable production sector has not been satisfactory, especially during recent years. The available estimates suggest that the current per capita consumption levels are far below the levels recommended by nutritionists and that the quantity available for consumption has decreased during recent years.

Increased production of vegetables has desirable effects on the economic growth and welfare of the people in the country. Thus, the government of Sri Lanka places considerable emphasis on the production of vegetables in its annual crop production programmes.

Policy makers are concerned with the formulation of effective policies to increase the consumption and production of vegetables. Knowledge of the factors determining consumers' demand and producers' supply response is of vital importance in the formulation of such policies. At present the knowledge on the above subjects is very limited due to lack of studies - perhaps caused by paucity of data.

This study attempts to provide a basic methodological framework for such studies and make an empirical estimation of demand and supply functions, within the limitations of available data. Aggregate consumer demand at national level is analysed by employing both single equation and simultaneous equation techniques. Aggregate supply response at the national level is analysed in terms of both output and acreage. The analyses concentrate on five selected vegetables. Two of them are exotic while the other three are indigenous vegetables.

It is shown that income has a more significant impact on consumers' demand for vegetables than price. Indigenous vegetables are found to be less preferred by the consumers over exotic vegetables, with increasing real income. Thus, the need for popularizing the indigenous vegetables, while increasing the production of exotic vegetables, is stressed. Moreover, it is shown that there is a necessity for the initiation of research to find out the feasibility or otherwise of using indigenous vegetables in the food processing industries.

The major hypothesis postulated for supply is that the producers positively respond to relative price changes. The analyses generally support this hypothesis. However,

the acreage response analysis reveals a somewhat slow adjustment by the producers to changes in economic circumstances.

It is shown that, in the short-run, the impact of the changes in productivity (technological change in vegetable cultivation) on the output is relatively more important compared with that of price.   Thus, there is scope for increasing the output of vegetables by encouraging the producers to adopt improved technology.   In turn, this would rely mainly on the provision of research and extension facilities and the development of an efficient input supply system, along with the implementation of price support policies.

Hamim, Alhusniduki

The Maize Industry in the Province of Lampung, Indonesia

144pp. 23 tab. 5 fig.

The maize industry plays a significant role within the economy of the province of Lampung, Indonesia.   In addition to its use for domestic human consumption, maize is also exported to countries such as Japan, Singapore and Malaysia.

This study attempts to formulate analytical techniques for examining and/or estimating production activities, demand, supply and the marketing of maize grown in Lampung.

A Cobb-Douglas (C-D) production function was fitted to cross-sectional data of 106 units of samples of smallholders from north, central and south Lampung.   A multi-equational model was employed in the case of north Lampung where rice production information was available.   It was felt that the latter model was more realistic and less restrictive, since it incorporated the concept of factor sharing under a multiple cropping system.

Sample farms were classified as small or large depending on the area being cultivated to maize.   The study indicates that the potential to expand production is greater for the relatively large farms than for the small farms.   Misallocation of resources (input factors) seems to be a general problem in farm practices.

Econometric models were formulated to estimate the supply response and both domestic and export elasticity of demand in the short and long-run, using time series data for the period 1967 to 1974. To assess the market prospects for maize, a market clearing equation was also used. The results show that the supply response of maize is dependent not only on the price of maize, but also the prices of other food crops and the cost of factors of production. With respect to domestic demand, it was found that per capita consumption was responsive to the price of rice relative to other foods such as cassava, and the level of income. The demand for maize exported to Japan and Singapore was found to be responsive to the prices of substitutes used in livestock and poultry feeds, the size of the livestock population, and changes in the economic activity (i.e. income level) in the importing countries. The market clearing equation indicated that there is a possibility of demand exceeding supply in the future. Unless serious efforts are undertaken to increase local production, the price of maize in the domestic market would therefore be expected to rise.

Examination of the traditional marketing system reveals several imperfections which could be overcome by improving transport, storage and quality control throughout the marketing chain. Changes in the structure of the marketing chain and in government policy on maize marketing are also considered necessary.

Such improvements would reduce the cost of maize marketing thereby enabling Indonesian maize to compete more effectively on the world market. The study also undertakes an analysis of the share of Indonesian maize within the world market.

Islam, Md. Nazrul

Economics of Small Scale Irrigation and Resource Use Plans in the Bogra District of Bangladesh

96pp. 27 tab. 2 fig.

Food production in Bangladesh has always been less than what is needed for domestic consumption. To meet the food deficit every year it has to import food grain from outside. Irrigation can play a major role in the production of food

grain in Bangladesh and can help to alleviate the situation. The pressure of population and the need for additional food supplies are necessitating the spread of irrigation through- out the country. Most of the surface water now available for exploitation is already being used. There is great scope for increasing the irrigated area in winter (dry months) by exploiting underground water using deep or shallow tubewells.

   In this study financial analysis and linear programming techniques are applied to investigate the impact of shallow tubewell irrigation at micro level on cropping pattern, farm income, economics of enterprise combination and resource allocation. The results of the criteria used for financial analysis have been found to be encouraging. The analysis gives positive net present values and high financial rate of return as a result of shifts in the cropping pattern towards the high yielding varieties of rice and as a result of the low cost of investment for each tubewell. Sensitivity analysis even at a 10 per cent increase in all costs, other things remaining the same, also indicates the soundness of the project.

   A linear programming technique is employed to determine for resource allocation purposes the optimum farm plan (i.e. that plan yielding the highest total gross margin) with and without irrigation. The analysis suggests that although the total gross margin with optimal allocation of resources without irrigation increases considerably compared to the original plan, with shallow tubewell irrigation in the optimum plan the total gross margin is increased further. Farm income, with irrigation, increases mainly as a result of increased cropping intensity and introduction of high yielding rice crops which are found to be more profitable under the existing resources and constraints compared to the local varieties. With irrigation, optimal allocation of the resources increases the labour absorption capacity of the farm considerably. This indicates that underemployment and unemployment prevailing in the study area can be reduced with tubewell irrigation. Parametric programming relaxing the production credit with irrigation implies that if more credit is made available to the tubewell farmers, it would further increase the total gross margin. With maximum absorption of production credit, total labour requirement will also increase which will further alleviate the under- employment problem.

The major policy implication of the results of the study is that potential exists to increase the total gross margin in the tubewell farms with optimal resource allocation. Considerable increase in food grain production is also feasible with irrigation. To enable the farmers to implement the optimum farm plans and to achieve the full benefits of irrigation, agricultural extension and research activities should be carried out in this respect with a co-ordinated effort.

Mateo-Bayani, Elsa P.

A Study of the Masagana 99 Rice Production Program in the Philippines

164pp. 32 tab. 5 fig.

The multiple objectives of boosting food production, generating employment, raising incomes and improving welfare could naturally be achieved by small farmers in the Philippines if all the resources required - including man-power, material and capital - were made available to them. In practice, unlimited support for the agricultural sector is not available from the government, so effective agricultural production programmes need to be devised.

This thesis reviews some agricultural credit schemes in developing countries - including the Philippines - that have been introduced to promote agricultural development, particularly increased production and improved welfare. This study then attempts to evaluate the Masagana 99 Rice Production Program in the Philippines and examines some of the problems that have affected programme implementation.

The results indicate that the Masagana 99 Rice Production Program did have some positive effects on production and has been moderately successful. It is still rather early to draw firm conclusions at this stage, but it appears that the M-99 programme not only contributed to increased production but also generated employment thus improving small farmers' income in general.

Mathema, Sudarshan B.

Development of Hill Farming in Nepal With Special Reference to the Tanahu District
95 pp. 37 tab. 5 fig.

There is an economic imbalance and socio-economic disparity
between the Hills and the Tarai (the plains).   The majority
of the Hill farmers of the country are operating at a
minimum subsistence level due to increasing population,
decreasing size of land holdings, soil erosion and deforest-
ation.   Under such conditions it was considered worthwhile
to undertake a study aimed at exploring the possibility of
increasing Hill farmers' income by the reallocation of
available resources.

This study attempts to explore the possibilities for
maximizing incomes of Hill farmers within the limits of the
available resources.   Feasible profit maximizing farm plans
are presented in the hope that this will indicate the extent
to which there is economic and technical 'slack' on the Hill
farms and potential for raising the standard of living.
The analytical technique employed is linear programming.

The optimal farm plans show that the selected farmers in
the study are allocating their resources close to the
optimal in the existing situation.   However, it is possible
to increase the incomes of these farmers by provision of
additional resources.   Inadequacy of cash to adopt optimal
farm plans suggests the key role of production credit.
Credit availability had a bigger impact on increasing farm
incomes than resource reallocation *per se*.   This was
examined via parametric programming.

On the basis of the findings, specific recommendations
are made.   Major objectives of national planning in Nepal
are to achieve national self-sufficiency in agricultural
production and to improve the standard of living of small
farmers.   To meet these objectives, the financial
institutions must give some priority to small farmers.

The main object of the thesis is to demonstrate the use
of LP as a farm planning technique under peasant farming
situations.   The direction in which efforts to extend the
applicability of similar studies on a wider sample of Hill
farms would provide policy guidelines that would be of great
practical value.   Simple budgeting and gross margin analysis

will still be important in the majority of farm situations
but given the availability of computer facilities, reliable
and adequate data, the linear programming technique is a
more useful and efficient technique.

Monkoltananont, Nopmanee

The Pig Cycle and Stabilization Schemes for the Thai Pork Sector

74pp. 12 tab. 13 fig.

The pig cycle, which can be described in terms of price and
production or demand and supply, arises from the interaction
of prices, the level of pig production and the volume of pig
slaughtering.   The basic theory underlying pig cycle
analysis is the cobweb theorem.   The modified models of it
used in this analysis follow those of Hartman (1974), who
applied the cobweb theorem to the egg cycle.   Standard
econometric techniques were used to analyse the demand and
supply responses.   The A.N.U. statistical package computer
programs were used throughout.

   Results from the analysis show that the pig cycle does
exist in the Thai pork sector though its length is somewhat
longer than the 4 years predicted by theory (Harlow's
studies).   This is due to the slow reaction of farmers to
price changes and to traditional practices in the Thai pig
industry.

   The demand analysis, on the one hand, shows that the
relationship between quantity and price is significant in an
economic sense.   It also shows that beef is a complementary
commodity for pork.   The problem of autocorrelation is
solved by either using appropriate statistical computer
programs (AUTREGAL) or by including the lagged dependent
variable in the demand equation.

   On the other hand, the supply analysis indicates that the
time lags in the price of pork and the feed price are
significant up to 21 months or 7 quarters.   Seasonal dummy
variables were also included in this analysis in order to
test whether or not the seasonality in the dependent
variable has been accounted for by the independent variables.
They were generally found to be significant.   An Almon lag
procedure, which shows how the quantity responds to

distributed prices for successive time lags was adopted. It
revealed a time lag of up to 8 quarters.   The stability test
(Chow's test) shows that there have been no structural
changes in the pig industry during the period studied (1961-
1975).

Various stabilization schemes are proposed and discussed
in order to overcome the problem of the instabilities which
exist in the pig industry.   Some instabilities are inherent
and some are due to intervention by the government which, for
example, maintained low prices of pork for the benefit of a
small group of consumers but to the detriment of the majority
of producers.   A fixed minimum price for pork and price
controls on feed are the proposed price stabilization
policies, while a breeding programme and the regulation of
supply are the suggested output stabilization schemes.   In
the Thai situation, supplementary policies, e.g. more free
market environment, formation of co-operative or semi co-
operative organizations are also discussed.   Effective
implementation of suggested stabilization schemes will give
a welfare gain to both producers and consumers and to the
Thai economy as a whole in the long run.

Pinyopusarerk, Maneerat

Supply Response of Sugarcane Farmers in Thailand

137pp. 27 tab. 3 fig.

Sugar is one of the major exports of Thailand and sugarcane
is the most important raw material used in producing sugar.
Time series data for 8 years from 1967/68 to 1974/75 were
analysed to estimate a supply response function for sugar-
cane farmers in 4 regions of Thailand, viz. Central,
Eastern, Northern and North-eastern regions.   *A priori*,
farmers' decisions on the sugarcane planted area were
expected to be influenced by relative expected profitability
per rai of sugarcane, the level of rainfall at the sowing
period, the influence of the Sugarcane Farmers' Association,
the activity of quotamen, the cost of inputs, and Government
intervention.

Relative expected profitability per rai is defined as
expected price per tonne of sugarcane times its expected
yield per rai (i.e. gross return) divided by the product of
expected price per tonne of the competing crop and its

expected yield per rai.   Expected yield was found by re-
gressing yield over time.   Farmers' price expectation
formations were specified using the Nerlovian Expectation
and the Naive models.

   Due to unavailability and unreliability of data, many
variables were inevitably dropped.   The general model was
simplified and adjusted.   Good fits, therefore, were not
obtained.   However, it was found from the study that
farmers in two regions, viz. Eastern, and North-eastern
regions, have an inelastic supply response function.   It is
only farmers in the Northern region who have an elastic
supply response function ranging from 2.00 to 5.52 depending
on differing expectation models and the use of differing
techniques.

   Policy recommendations, consequently, were not made
because of the inadequacy of the results obtained.

Rañola, Roberto de la Fuente, Jr.

*Variations in the Adoption of the High Yielding Rice Variety
Package Among Cavite Farmers, Philippines*

124pp. 27 tab. 4 fig.

The overall purpose of this study was to contribute to
understanding of the differences in the extent and intensity
of individual farm use of the HYV package in Cavite Province
in the Philippines.

   Multi-stage random sampling was used to select the
farmers from two municipalities in the lowland rice growing
area of Cavite Province.   The data used was part of data
collected to study the 1973-74 wet season inter-farm
variation in rice yields.   The 1972 wet season crop data
was taken from six of the series of personal interviews and
field observations collected in connection with the rice
yields study.

   For the test of simple relationships using the contingency
analysis, only one hypothesis among the seven relationships
tested was found significant.   The simple analysis showed
that farmers who used straight-row planting did so to make
use of rotary tillers.

In the discriminant analysis, three variables were used
to define the 'level' of adoption of the HYV package: (1)
the percentage of rice land cultivated during the wet season;
(2) the number of cultural practices used along with HYV; and
(3) the amount of chemical and fertilizer inputs used on
cultivated rice land devoted to HYV. Based on these criter-
ion variables, three groups were developed: 'full adopter',
'partial adopter' and 'non-adopter'.

The best discriminant model describing adoption was the
three-group, one discriminant function model. The endogen-
ous explanatory variables directly related to the defined
'level' of HYV adoption in descending order of importance
were: (1) proportion of neighbours planting HYV; (2) farm
location variable controlling for water availability in
district 5; (3) percentage of farmer's share of harvest which
was sold; (4) talking to an agriculturist; and (5) percentage
shareholding. The variables inversely related in descending
order of importance were: (1) farm location variable con-
trolling for water availability and soils; (2) farm location
variable controlled by municipality possibly related to
differences in water availability and soils; (3) known
difference between the highest and lowest yield of HYV; and
(4) size of rice farm cultivated. Overall, 75.2 per cent
was explained by the endogenous and exogenous variables.

In the canonical correlation analysis, the 'level' of HYV
package adoption was defined by five criterion variables:
(1) the percentage of rice land cultivated during the wet
season; (2) the amount of chemical and fertilizer inputs used
on cultivated rice land devoted to HYV; (3) the number of
labour saving cultural practices; (4) the number of labour
using cultural practices used; and (5) the number of modern
inputs used.

Three sets of canonical variates were developed. The
first set indicated the degree of HYV package usage that was
labour-using not labour-saving.

The second set indicated the degree of HYV package usage
that was labour saving.

The last canonical set indicated the trade-off between
labour using techniques and the amount spent on purchased
inputs.

Raquib, Abdur

Increasing Small Farm Income and Resource Use Through Agricultural Credit in Bangladesh: A Case Study

107pp. 23 tab. 4 fig.

Rural development with distributive justice is the major goal of the economic development strategy of Bangladesh. To achieve this goal, efforts are being made to raise agricultural output and to create more employment opportunities for the rural unemployed. The adequate flow of agricultural credit to quicken the diffusion of capital and labour intensive HYV crops with increasing use of modern inputs is the major component in the rural development programme of the Government of Bangladesh.

This study is an attempt to assess the credit requirement of the small farmers and to analyse the impact of credit on cropping intensity, farm income and labour use in the 'Barind' area of Rajshahi district of Bangladesh. A linear programming approach has been adopted.

The study has revealed that working capital is the most binding constraint and adequate availability of institutional credit substantially raises cropping intensity and farm income. But the credit for crop farming alone has a limited role in creating additional job opportunities.

Further, the study has shown that the relatively smaller farmers utilise credit more efficiently and as such their optimal credit need per acre is also much higher than that of the existing per acre credit ceiling of the institutional agencies.

Therefore to exploit fully the potentialities of the rural areas and to ameliorate the impoverished conditions of the small farmers an increased flow of rural credit for farming activities is essential.

Sabariyah, Din

Price Support and Stabilization Measures for Padi/Rice in Peninsular Malaysia

170pp. 30 tab. 12 fig.

Institutional and price measures are the two components of

government policy applicable to the Malaysian rice economy.

This study analyses the operation of price support measures employed to uphold producer prices (the Guaranteed Minimum Price) and the price stabilization devices.

The effectiveness of producer price supports as a production incentive is first measured. The study utilises an acreage response analysis for both main season and off season wet padi in selected commercially oriented states. The analysis points out that the present price incentive is weak in stimulating rice supply. What appears to be more important to the Malaysian rice farmers is real income. Differences between the buying price of rice at the retail level and the selling price of padi at the farm gate seem to be more significant in generating producer responses than the Guaranteed Minimum Price (GMP) as such.

The elasticity of supply with respect to price difference is fairly inelastic in the main season and varies from 0.8 to 2.5 in the off season.

The study next deals with the second element of the rice policy - the price stabilization apparatus.

A theoretical framework for price stabilization in a supply shift market is summarized and then applied to a specific model of Malaysian Rice Price stabilization. A numerical analysis follows to quantify the effectiveness of this policy in stabilizing the domestic rice price. The results reveal that the policy has varying degrees of success.

A specific partial equilibrium analysis of buffer stock and import quotas over two periods shows that, in general, these operations stabilized producer revenues, consumer expenditures and foreign exchange expenditures. Producers in particular are seen to be better off as their total revenues increased at the expense of consumer expenditures. As long as rice is still the dominant staple food in the household budget in Malaysia, such a policy would act as a mechanism of income transfer from all sectors to the rice economy.

Sanguanwongwan, Kanchana

An Economic Study of Foreign Demand for Thai Cassava Products

102pp. 17 tab. 11 fig.

Cassava products have become one of the most important exports of Thailand since 1960. About 95 per cent of total production of cassava is exported. Most of the cassava products are exported in the form of chips, meal and pellets as a raw material for animal food production. Thai cassava products for animal feed are mostly exported to the European Economic Community (EEC) countries, especially the Federal Republic of Germany, the Netherlands and Belgium.

Since 1962, the quantity of Thai cassava products exported to these three countries has been increasing considerably. This was due to the introduction of the Common Agricultural Policy in the EEC which raised the prices of grains. In turn, this increased the feed compounder demand for grain substitutes such as cassava in order to lower the cost of feed production. At the same time, these three countries also have been expanding their livestock industries which induced the increasing use of cassava in feeding livestock.

Estimation of foreign demand for Thai cassava has been attempted. The results indicated that changes in substitute prices had different effects on cassava imports in each country and so did the change in livestock numbers. However, on the aggregate demand equation, livestock numbers were the most important factor explaining the changes in demand for Thai cassava.

The projection of foreign demand for Thai cassava has indicated that in 1980 the projected level of cassava imported by these three countries together will be 1,945 thousand tons on the assumption of constant price and 2,552 thousand tons on the assumption of continuation of price trend.

Nevertheless, it can be concluded that Thai cassava trade is not quite as successful as it should be. Recommendations are given for improving the existing standard (quality) of the products.

Sarhangi, Rahmatollah Fard

The Measurement of Gains and Losses From Agricultural Research

121pp. 5 tab. 18 fig.

This thesis is a survey of research over the last two decades stemming from the now classical study by Griliches on evaluating the gains from Agricultural research. The thesis points to a number of areas in which there are problems which need to be resolved, and hopefully, in a few instances, provides the basis on which future research may proceed.

The most important point of concern is the under-estimation of social gains (losses) provided by the supply-shift approach developed by Griliches. Wisecarver has shown that estimates based on shifts in input-demand curves are an appropriate method of estimating such gains.

Several studies which have attempted to estimate the distribution of productivity gains between consumers and producers were shown by Scobie to have used formulations of consumers' and producers' surplus which give different, and even contradictory, results for the same question. This problem was shown to be mainly attributable to the different mathematical approaches adopted. However, the important point which arises from this issue is that there needs to be questioning about the appropriateness of the supply and demand, or input-demand specifications adopted. Further, it is desirable that the formulae derived adopt standard specifications for the shifts in the supply or input-demand curves and elasticity estimates.

Shamsuddin, Norasmah

An Analysis of Labour Supply and Productivity in the Oil Palm Industry: A Case Study of the Cape Hoskins Settlement Scheme, Papua New Guinea

205pp. 41 tab. 14 fig.

Since World War Two, efforts to promote the growth of commercial agriculture in the economy of Papua New Guinea have included a strategy for encouraging both estate and smallholder production of agricultural export crops. One recent facet of this has been the establishment of 'nucleus

estate' schemes that involve an interdependent relationship between large scale estates and processing facilities and land settlement schemes for smallholders.   One such scheme was the Cape Hoskins Oil Palm Land Settlement Scheme. Commencing in 1968 this was the first large scale 'nucleus estate' in the country and had as its objectives the introduction of oil palm on a commercial basis, the integration of people of different ethnic backgrounds into a single settlement scheme and the utilisation of some of the unexploited land resources of the country.

In this study, analysis is made of data from a comprehensive labour availability and utilisation study of a sample of twenty-three settlers[1] from Kapore, the first subdivision established in Hoskins.   The objectives of the study are:

   (i)   to examine the settlers actual labour utilisation
          patterns;

   (ii)   to test the explicit and implicit assumptions
          made by the Project Planning Team regarding the
          availability and utilisation of labour of an
          average household;

   (iii) to relate labour inputs in oil palm to the
          performance of settlers in terms of their output
          levels via the estimation of a production
          function and a technical efficiency index of
          settlers.

The most notable findings of the labour input analysis are that an average settler household utilised more labour than was originally assumed by the Project and was able to overcome its family labour shortages during times of peak labour demand, e.g. harvesting, by utilising outside assistance obtained through a system of mutual labour exchange amongst households.   Examination of differences in labour inputs of settlers reveals that significant variations exist in labour inputs in oil palm activities among the three ethnic groups and three household categories studied.

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1   Collected by Dr R.T. Shand and W.F.M. Straatmans,
     Department of Economics, Research School of Pacific
     Studies, The Australian National University.

Multiple Regression Analysis on a cross-sectional time
series data matrix indicates that a statistically
significant percentage of inter-settler variations in output
of fresh fruit bunches of oil palm is explained by the
number of trees, the age of these trees and the managerial
ability of the settler.   Regression analysis of an index of
technical efficiency, derived from the farm effect coeffic-
ients of the production function, reveals that a significant
portion of the variations in technical efficiency of
settlers could be attributed to the level of labour inputs
in maintenance of oil palm holdings in the Development Phase
and to the ethnic grouping of the settlers.   Hence,
differences in labour input in maintenance of holdings during
the Development Phase explains a significant percentage of the
inter-settler variations in output of oil palm.   Labour
input in harvesting was shown to be a function of fresh
fruit output while labour input in hand pollination is
postulated to determine output levels.   A comparison of
actual with predicted yields in Kapore and with actual
yields in Nigeria and Malaysia seemed to suggest the
inappropriateness of interior 'Bliss Point' theoretical
models in a situation such as the Hoskins Land Settlement
Scheme where farmers are plunged into a fully commercial
venture.

In conclusion this study stresses the need for further
investigation of the differences in labour inputs in oil
palm and hence in management levels.   It is suggested that
they be studied in the light of two possibilities:

(i)   that labour input is varied according to
       settlers' own choice;

(ii)   that variations in labour inputs are due to
       settlers' lack of knowledge of appropriate
       management practices for oil palm.

If differences in management levels are attributed to (ii)
above, this thesis suggests the intensification of the
extension services while taking cognizance of inter-settler
differences in management ability.   But if it is due to (i),
inter-settler output variation would no longer be a problem
of extension but of work-leisure preference and future
studies should be directed at the determination of work-
leisure preferences and the ultimate estimation of the
subjective equilibrium point of settlers.

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Sharma, Shashi Kumar

Planning Agricultural Development in a Hill Region of Uttar Pradesh - India: A Programming Approach

157pp. 35 tab. 7 fig.

In India's planning history no proper attention was given to
the hill areas up to the year 1969 except to the extent that
they were covered only under the general framework of the
Community Development Programme.   During the 4th FYP period
these areas were identified and classified as 'Backward
Areas' and were given some consideration, though still
inadequate, to enhance the economic development.   It was
only in the 5th FYP (1974-1979) that specific programmes
were formulated with the aim of improving the economic
situation of the farmers.   The primary thesis of this study
is the contention that a successful planning programme in
the agricultural sector must start with the individual farm
units as the basic planning unit.   The planning objective
is to enable the farmer to secure higher income levels and
greater employment opportunities in the context of general
economic development.   Farmers need assistance in planning,
evaluating, and developing more productive and profitable
systems of operation and in this study an attempt is made to
assist this decision-making process employing both linear
programming (LP) and Monte Carlo Simulation in a complemen-
tary fashion.

   In this analysis two average farm sizes, small and large,
are considered in order to represent most of the farms in
the area.   To make the plans more relevant, attention is
given to the farmers' resources, family goals, needs and
the problems which impede their progress under the existing
technology.   The analysis proceeds further, introducing
improved technology in the form of new, improved, and high
yielding crops into the existing situation whilst maintaining
other specified constraints.   In all, 'eight alternative
farming systems' are examined to provide farmers with a wide
range of choice.

   A major objective of this study was to test whether
resource allocation between existing and new enterprises
would enhance farm income both under existing and improved
technologies.   Application of LP suggested a marked
increase could be obtained in farm income and surplus

supplies of human labour and cash could be utilized on both
the farm sizes under existing technologies.   With improved
technology, the available cash and human labour supplies
(particularly in the month of May) are found to be in-
sufficient to meet growing requirements owing to the intro-
duction of cash and labour intensive food and cash crops.
The initial credit supplies made available to the farmers
also failed to meet the enlarged demand for cash.
Alternatives, presented with unlimited credit availability,
exploited the resources and generated higher levels of
incomes.   Thus, this clearly indicates the increased
employment potential in the farming sector if improved
technology is made available together with credit facilities.

An important piece of information gathered from the dual
solutions indicated that cash and credit supplies (only in
plans with limited credit availability) and irrigable land
are the main binding constraints.   Human labour is also
found to be a binding constraint but the supplies can be
increased in critical periods as the area is in labour
surplus.   Parametric variations of these constraints are
examined to investigate the effects of farm income, etc.
An exercise with parameterization of credit availability
showed the limits of profitable credit use.   This was shown
to be higher than that of the original availability.   The
restriction on irrigable land was relaxed (which is possible
only in the long term) and showed that small farms are more
efficient users of irrigable land than larger farms.   This
was reflected in the relative increase in income of both
farm groups under study.

Calculations were made employing Monte Carlo simulation
to complement the LP results using the same input-output
coefficients.   These generated a range of variable plans,
unlike LP, for each of the alternatives.   Thus, simulation
offered a number of choices to the decision maker, the
farmer, depending upon his subjective criteria and resource
supplies.   The risk management problem was also tackled
applying a multi-objective approach which showed that these
sub-optimal solutions are of great importance if more than
one objective were to be considered.   The results suggested
that it is the future development of the labour market in
the area, not the risk and uncertainties associated with
yields and prices of farm inputs and products, which would
affect the farmers' strategy in the selection of enterprise
combinations or farm plans.

It is evident from this study that a combination of these two programming techniques employed in the farm planning process would provide a much more realistic basis for decision making by offering a range of solutions with wide variability.

A further objective of this study was to test the applicability and reliability of LP and Monte Carlo simulation techniques for the purpose of farm planning in the hill areas of Uttar Pradesh - considering the individual family farm as a planning unit.   Though results obtained show great promise, the limitations of data require that they should be treated cautiously for planning purposes.

To make plans more effective and practicable, data, particularly input-output coefficients, should be updated and horticultural crops - fruit crops - should also be included in the plans.   Finally it is suggested that a dynamic model should be explored to take account of the developing agricultural systems.

Thesis Abstracts 1978

Addo, Seth Kenneth Lartey

Some Neglected Issues in the Economic Analysis of Project Management in Ghana

189pp. 10 tab. 7 fig.

The Agricultural Development Bank (ADB) is an important financial organisation and is the main source of credit for agricultural projects in Ghana. The purpose of this study is to examine the procedures and method of analysis in project planning and management adopted by the ADB with the main object of identifying some of the neglected issues and to suggest some methods for improvement.

   Agricultural project planning and management by the ADB have been found to be plagued by a number of problems and inefficiencies in the areas of identification and selection, formulation, approval, implementation, supervision, monitoring and control. These areas are systematically examined and the main problems and bottlenecks are identified.

   An examination of the current state of project appraisal methodology is undertaken. The main project appraisal procedures are also reviewed, bringing out the difficulties of economic cost-benefit analysis and offering a critique of the appraisal procedures.

   Suggestions for improving project identification and selection, formulation, implementation and supervision in the ADB are made based on the writer's insights into and experiences of the various problems identified with the production process. Cues are also taken from recommendations made for developing countries by such organisations as the FAO, IBRD and USAID.

   The major contribution of the study is the use of probability appraisal to analyse risk in a maize and pineapple project financed by the ADB.   The Monte Carlo

simulation technique is adapted for use in this analysis. Results from this technique are compared with original results of the same projects obtained by the use of conventional cost-benefit analysis where single value estimations of costs and prices are made.

Results from the probability analysis indicate that the methodology enables us to provide management with more appropriate information for making the right decisions by recognising the variability of outcomes of projects in the face of risk and uncertainty. Mean values of three indicators of worthiness obtained under this technique are also thought to be more reliable and acceptable, especially since we do not have to fear any large variations around these values.

Limitations of the analysis and directions for future research are indicated.

Best, Patricia

An Economic Analysis of the Wauna-Yarakita Oil Palm Project Using the Little and Mirrlees Approach to Project Appraisal

204pp. 28 tab. 6 fig.

This study investigates the relative merits of the two most frequently used methods of agricultural project appraisal – the Conventional Efficiency Analysis as described by Gittinger and the Little and Mirrlees methods – in relation to the development of an oil palm project in Guyana and in the context of Guyana's relatively open economy. An evaluation of the two alternative techniques are given in light of results.

Using the existing literature on project evaluation techniques, available methods are reviewed in an effort to justify the choice of the two methods. The Conventional Efficiency Analysis and the Little and Mirrlees methods are discussed in detail, the latter particularly, because of its relative complexity.

The nature and history of oil palm production in Guyana is also discussed to indicate the possible contribution of the oil palm to the development of Guyana. The crop's world production, trade and its position in the world fats

and oils economy are also considered in an appendix.

In the investigation of the social profitability of the
Wauna-Yarakita oil palm project using both methods the
criterion used is the internal rate of return supplemented
by the net present value and benefit – cost ratio in some
cases.   The rates of discount utilised in the calculation
of the net present values are 8 and 10 percent.   The study
mainly utilised data contained in the report on Oil Palm
Development in Guyana, South America 1976-1980 by Ndaeyo
and Isang.

The main conclusion of the study is that, in the context
of Guyana, there was no difference in the decisions taken,
as the rates of return obtained in both cases were quite
high.   The use of the Little and Mirrlees methods for marginal
projects could, however, make the difference between
acceptance and rejection.   It could also be deduced that
the contribution of the Little and Mirrlees method may only
be substantial in a situation where border prices are thought
to differ substantially from domestic price levels.   Where
such a situation does not occur, one need not go all the way
to Little and Mirrlees but rather modify the Conventional
Efficiency Analysis procedures (e.g. SER, SWR) and yet obtain
similar results.

The project when the extraction of timber was included
yielded an investment which although profitable had no real
rate of return.   Finally, the effects on the rates of return
of cost over-run, increased oil palm yields, different
levels of consumption in the unorganized sector and a higher
shadow wage rate were also discussed.

Gautam, Lakshman Kumar

*Trade and Welfare Consequences of Land Lockedness: Theory and
Empirical Evidence From Developing Countries*

149pp. 25 tab. 5 fig.

The purpose of this study is to analyse, both theoretically
and empirically, the international trade and economic welfare
consequences for land-locked developing countries of having
no direct access to the sea.   More specifically, the study
aims firstly to show that the natural barrier to overseas
trade due to land-lockedness is substantial, compared with

both the value of goods they trade internationally, the
natural barrier due to ocean shipping costs and the
governmental barriers due to restrictive international trade
policies.   Secondly, it draws on international trade theory
to derive a number of testable hypotheses concerning the
trade and welfare consequences of land-lockedness.   Where
available secondary data permit, these hypotheses are then
tested using non-parametric statistical techniques.   By and
large, the evidence is not inconsistent with the hypotheses,
suggesting that land-locked developing countries do indeed
have an additional significant trade barrier over and above
that of their non-land-locked neighbours.   The study con-
cludes by suggesting some policy implications which follow
from the analysis.   In particular, if land-locked
developing countries are to take as much advantage of the
gains from international specialization of production as non-
land-locked countries, they need to ensure that they have less
government-imposed barriers to both commodity and factor
trade than their neighbours, and that any government planning
of industrial development promotes industries that not only
make the best use of the country's resource endowments (that
is, labour-intensive, low-skill industries) but also involve
low transport costs.

Ginting, Meneth

*A Study of Poverty and Allocative Efficiency in Sriharjo,
Rural Java, Indonesia*

161pp. 50 tab. 7 fig.

This study is about the phenomena of poverty and allocative
efficiency in the village of Sriharjo in rural Java in 1972.
An attempt has been made to describe and to explain these
phenomena.

The main characteristics of the village and the household
sample can be stated as (i) too many people and (ii) not
enough land.   However, the village of Sriharjo is not the
most densely populated village in the *Kabupaten* (District)
Bantul in the Special Region of Yogyakarta.   It was ranked
44 out of 73 villages in terms of population density in the
Kabupaten.

In the analysis of poverty, an attempt was made to compare
the data from Sriharjo and the data from SUSENAS (National

Social Economic Survey) for rural Java analysed in other studies.   It was found that the situation in Sriharjo was worse than the average calculated for rural Java from SUSENAS, in the sense that the percentage of people below the poverty line (the so-called *cukupan* level of living) in Sriharjo is more than that calculated for rural Java. However, the Gini coefficient of income concentration for Sriharjo is still less than the Gini coefficient calculated for some countries in Asia.   Also the share of the poorest 40% is more than 17% of the total income, suggesting that the inequality of income distribution in Sriharjo is low.

   The techniques of the Lorenz curve, the Gini coefficient and the share of the poorest 40% of total income are suitable for the measurement of dispersion, but they do not explain the existence of the 'ceiling' and the 'floor' that seems to fix the range of the net income of the households in Sriharjo.

   In relation to the net income per annum of the households (income is one of the measurements of poverty), it was found that the *pekarangan* (house compound, or house garden) is the main source of net income (49%) followed by *sawah* (wet rice field) which contributes 35% while the other earning activities outside agriculture only contribute 16%.

   One of the hypotheses that was tested quantitatively was that the net income of the household sample was substantially affected by certain socio-economic factors.   The socio-economic factors that were taken into consideration were land controlled, number of earners, the age of the head of the household, occupational patterns of the head of the household as dummy variables and also the poverty line of *cukupan* as a dummy variable.   This hypothesis was tested by OLS with the semi-log linear function, and the hypothesis was accepted for the whole household sample, both the non-*cukupan* and *cukupan* groups.

   In the comparison of the non-*cukupan* group with the *cukupan* group the relation between net income and the socio-economic factors were explained better in the *cukupan* group (the R^2 for the *cukupan* group was larger than the R^2 for the non-*cukupan* group).   However, with the Chow test, the test of equality between the coefficients obtained from the non-*cukupan* and *cukupan* groups shows that the two relationships

do not differ significantly at the 95% level of significance. So the hypothesis proposed is accepted in the same manner in both groups.

The term 'efficiency' taken into consideration in this study is allocative efficiency which refers to the optimum way in which a farm combines inputs when faced with a given set of input prices.   The approach used to examine allocative efficiency has been to estimate a Cobb-Douglas production function with elasticities ∞_i and to make some statistical tests of equality between the estimated marginal value product of a factor (MVP_i) and its marginal factor cost (MFC_i).   It was hypothesised that the farmers in Sriharjo are 'efficient', which conforms with the hypothesis posed by Schultz (1965) that there are few significant in-efficiencies in the allocation of the factors of production in traditional agriculture.   The Schultz hypothesis was rejected, which implies that there is still scope for in-creasing agricultural product through the reallocation of existing resources, as discussed in the present study. However, the scope for increasing agricultural product is limited because of the characteristics of the village and the household sample already mentioned: too many people and not enough land.

Hada, Kumar Prasad

A Study of Farm Household Income and Resource Allocation in the Eastern Hills of Nepal

168pp. 29 tab. 6 fig.

The success of any development project aimed at improving the economic conditions of the people in an area depends to a large extent on the degree of understanding about the socio-economic conditions of the people in the area.   The present study is an attempt to shed some light on the existing economic conditions of the farm households in the eastern hills of Nepal.   This is attempted through the investigation of the major socio-economic determinants; the pattern of distribution of income of the household; and the assessment of the efficiency of farm resource use given the traditional technology and production function.

The major determinants of income of the farm households are investigated by using correlation analysis and

regression analysis.   The results of these analyses in-
dicate that land is the most important determinant of
income followed by ratio of lowland to total land and age of
the household head.   The variable 'adult members of the
household' failed to be an important determinant of income
of the household.

   The analysis of income distribution reveals that farm
income is more unevenly distributed than farm household
income, while income on a per capita basis appeared to be
having a relatively more even distribution than on a per
household basis.   The inequitable distribution of incomes
appears to be closely associated with the distribution of
size of land holdings.

   The assessment of the allocative efficiency of farm
resources exposed a situation of under-utilization of labour
in rice production.   The under-utilization of labour,
especially in a country where a substantial portion of labour
is believed to be idle, is considered as a matter of great
wastage.   An attempt is made to explore the probable
reasons for the under-utilization of labour, but to ascertain
the possible ways of increasing the labour utilization in
crop production needs further investigation.

Hossain, Md Moazzem

*The Influence of Rural Transportation Systems on Regional
Economic Development and Commercialization of Agriculture
in Some Selected Areas of Comilla District, Bangladesh*

173pp. 17 tab. 13 fig.

The economic progress of a country like Bangladesh cannot
be considered without giving top priority to the improvement
of rural life.   Among the economic and social factors
contributing towards development, the role of rural
transportation systems is a significant one.   This study
investigates the contributions that appropriate rural
transportation systems have on the developmental process in
the Comilla district.   A case study of two selected
regions was undertaken.   These are the regions of Kotwali
with a relatively better transport system and the Burichong
region regarded as control.   A contrasting picture of the
two regions' agricultural development was revealed by the
analysis.

To investigate the possible causes of such a picture, the efficiency and cost structure of the different modern and traditional modes of transport such as truck, tractor, cycle rickshaw, bullock cart, country boat and human modes (shoulder or head load) were discussed using statistical and econometric techniques. Utilizing the available information on the rice trade of transportation pattern, cost of production and prices in the two regions, the economic benefits of rural roads were assessed by estimating the producer surplus. Examples of social benefits were enumerated.

The effects of distance covered and volume hauled on transport cost for the different modes was examined using a quadratic transport cost function. Finally, the most economic rice transport task, i.e., the least-cost combination of modes and routes subject to given assumptions relating to production and consumption centres, was attempted. This was based on the results arrived at using a network analysis approach.

Mangabat, Minda C.

An Exploratory Study of Factors Affecting Farm Capital Formation: Central Luzon, Philippines

110pp. 10 tab. 6 fig.

Private capital formation or investment in agriculture is to a large extent influenced by economic, social and institut-ional factors. An attempt has been made in this study to investigate and quantify the effects of some economic and other factors which may have influenced the capital formed on rice farms in the Central Luzon Region, Philippines. The study is based on cross-sectional data of a sample of 324 farms. The data pertain to the crop year July 1, 1973 to June 30, 1974. Since data were available for only one time period, a short-term farm investment model was formulated instead of a dynamic investment model. The identification and measurement of the variables in the conceptual model were also determined by the constraints imposed by these data.

Based on investment theory and results of empirical studies, it was the *a priori* belief in this study that the private investment on the farms would be a function of internal finance (e.g. income and savings) and of external

finance (e.g. credit). It was also the belief that other factors characteristic of the farms/farm families may have an influence on the investments undertaken by farmers. These other factors are, namely, size of holding, household size, adoption of new farm practices and farm tenure. It was hypothesised that size of holding, income, savings, credit, and adoption of new farm practices would have a positive influence on farm investment. On the other hand, household size and farm tenure were expected to have either a positive or negative influence on farm investment.

It was also assumed that net investment and each of the abovementioned factors associated with it have a linear relationship and that the farm investment function used was a single independent relationship. The technique of ordinary least squares was utilised in the estimation of the investment function.

Results of the regression analysis were largely theoretically consistent and statistically dependable even though the data used were only cross-sectional. As hypothesised earlier, the estimated marginal investment coefficients for the size of holding, income, savings, credit, and adoption of new farm practices variables were positive and significantly different from zero except for savings. On the other hand, household size and tenurial status other than owner operator had negative coefficients. The general possible implications of these findings were also stated.

Oluoch, Kosura Willis Aggrey

The Analysis of Labour Utilization in Smallholder Tea Farms in Kenya

147pp. 21 tab. 15 fig.

Rapid growth has taken place in the smallholder tea sector in Kenya and the dynamic response to incentives, by which this has been accomplished, is remarkable. This study undertakes to examine the role of one of the major inputs in tea production, labour, which in addition to working on tea must also work on subsistence production, household activities and off-farm jobs.

The introductory chapter traces the historical development and success of the smallholders in Kenya growing tea, a crop

originally thought to be unsuited for smallholdings. The developmental aspects of tea in providing rural employment, income and foreign exchange are highlighted.

The role tea plays in absorbing labour in the rural areas is considered in the context of some of the existing development models. It is argued that since the labour absorption capacity of the urban sector is limited, models of the Lewis-Fei-Ranis type may not be suitable to the Kenyan situation while models emphasising rural labour absorption such as that of Fisk (1962) and Myint's 'Vent for Surplus' model (1964) may be useful.

Survey data originally collected in 1965-66 is used to examine the allocation of labour to various activities and the inter-relationship between them. It is found that while other agricultural activities have a seasonal pattern, tea after establishment has some evenness and flexibility of labour demand. Tea is found to be closely associated with increasing hiring of labour (a positive correlation existing between tea acreage and hired labour). The hired labour either supplements family labour or is used where the family has off-farm work. There was no evidence of a labour constraint for tea production.

The production function of tea is revisited in an attempt to include harvest labour in the function under the hypo-thesis that, at the margin, there may be some substitution between the labour and the tea bushes. This relaxes the earlier assumption of fixed factor proportions hypothesised by Etherington (1973). However, the study concludes by not rejecting the earlier hypothesis and asserts that in a situation where there is no labour constraint, provided that capital and other inputs like management have been correctly specified, there may be no need to include harvest labour because output will determine it and this will be available in the family or through hiring.

The study concludes with some suggestions for further investigations into the current situation on the smallholder tea farms of Kenya following the continued rapid expansion of the tea area and increased maturity of the tea bushes over the last fifteen years.

Rachman, Bochari H.A.

Strategy For Smallholder Rubber Development in South Sumatra

209pp. 64 tab. 8 fig.

Rubber production is a major source of income for smallholder
farmers in South Sumatra. In addition rubber produced by
smallholder farmers is the major raw material for the
region's rubber processing industry and an important foreign
exchange earner. The general neglect of the industry over
the last 30 years has been an important factor in deteriorat-
ion of the industry in the province.

   Current government strategy towards the improvement of
rubber smallholdings is concentrated on the 'integrated'
schemes which are styled after those of Malaysia. Economic
and financial analysis indicates that the schemes are feas-
ible and, given the availability of the planned amounts of
finance, the author of this study does not doubt that the
schemes would be successfully implemented.

   The cost to government for the implementation of the
schemes, however, will be so high that the replanting target
of 3 percent per annum would be hard to achieve. In this
study, therefore, the use of a 'low-cost' planting model
which is similar to that in Pelita I and Thailand's
approaches is emphasized. This model will spread the
improvement over more smallholders, although the individual
benefit secured by them would be less than it is in 'inte-
grated' schemes. It is also likely to give a better return
on capital investment. Even using this model, however, the
government still has to increase the flow of investment,
strengthen the Dinas Perkebunan staff for the implementation,
and strengthen the research on smallholding problems.

   Other factors which would appear to be crucial in
bettering the position of the South Sumatra Rubber Small-
holdings are: improving the quality of rubber produced by
smallholders in conjunction with improving marketing and
transportation systems. No attempt has been made to
analyse these factors in detail owing to data and time
constraints. Nevertheless, from broad discussions, this
study also raises several suggestions on these matters.

Rahman, Md Habibur

*A Study of Foodgrain Production and Requirements in Bangladesh:
With Particular Emphasis on the Potentiality of Wheat
Production in the Northwest Region*
133pp. 54 tab. 12 fig.

Bangladesh is one of the few countries of the world where the
vast majority of people live at a very low level of absolute
poverty.   The situation is aggravated by a shortage of food-
grains resulting from the growing population.   In view of
this chronic foodgrain shortage, the Government of Bangladesh
has, since the late sixties, been trying to increase the
domestic production of foodgrains by introducing High Yield-
ing Varieties (HYV) of rice.   The First Five Year Plan
(1973-78) of Bangladesh spelled out that by the terminal
year, 1978, the country would be made self-sufficient in
foodgrain production with the help of HYV rice.   However,
the rate of adoption of HYV rice has been much slower than
anticipated due to resource and socio-economic constraints.

   A review of the planned targets from the First Five-Year
Plan reveals that by 1976-77 the actual production reached
84 percent of the target of that year.   Furthermore rice
production had not increased beyond that of the three years
earlier.   Consequently there were huge shortfalls varying
from 1.5 to 2.9 million tons of foodgrains.   These short-
falls were met by imports, about 90 percent of which were
wheat.   Thus although wheat comprises 1-2 percent of the
total domestic production of grain, it comprises 15-20
percent of the total foodgrain consumption in Bangladesh.
From the point of view of the balance of payments situation,
therefore, it appears that although a minor crop, in many
ways wheat may be a crop of crucial importance in the
Bangladesh economy.

   This study therefore begins an investigation of the
production potential of HYVs of wheat.   HYVs of rice are
not equally suitable in all areas and seasons in Bangladesh.
In the northwest of Bangladesh the scarcity of water, low
rainfall and the availability of fertile land in winter may
make the cultivation of HYV wheat a more worthwhile
development strategy.

   The main part of this study investigates the economics of
growing Local Varieties (LV) and HYVs of wheat in an area of
Rajshahi in the north-west of Bangladesh.   A resource
productivity analysis was accomplished.

A Cobb-Douglas production function was fitted under a Multiple Regression Model to find out the productivity of individual resource inputs. It was assumed that the same production function is applicable for all the different sets of farms growing wheat.

The production function analysis of the LV and the HYV wheat farms revealed that the use of modern inputs, e.g. fertilizer, increases the yield of wheat both in the local variety (LV) and in the high yielding variety (HYV) of wheat. Even in the case of LV wheat, the use of fertilizer sub-stantially increases yield.

In the absence of rice data, the study could not make generalizations on the relative potentiality of HYVs of rice and wheat. Nevertheless the most recent data on wheat production in Bangladesh and the findings of the present study suggest that there is considerable scope for easing the food situation in the country by introducing HYVs of wheat in northwest Bangladesh.

This single crop study was done on the basis of 1974-75 data. To effectively place the findings in a planning context, a similar study is required which would compare the results of wheat of the present study against a similar set of results from farms growing other crops.

Somrongwatana, Suwannee

An Economic Analysis of the Performance of the Agricultural Cooperative System in Thailand

170pp. 60 tab. 6 fig.

The multi-purpose agricultural cooperatives of Thailand play an increasingly important part in the economic life of the country. They are an instrument of Thai government policy, intended both to help modernize farming and to perform welfare functions, especially in relieving farmers from debt. They are expected to carry out a number of purposes, i.e., credit, selling farm supplies, purchasing crops etc.

The data available were mainly aggregates, so that the study is essentially a macro study. But it is combined with attempts to probe the situation also at the micro level. Thus, the study was primarily concerned with analysing data

from the agricultural cooperatives in the aggregate but also
presents a case study of 3 individual societies.   The whole
study was based on time series analysis and cross sectional
analysis.

   The study stresses the inadequacy of management of the
cooperatives in decision-making, financial skills, attract-
ing business to the societies and in maintaining the
loyalty of their members.   It also shows that the aims of
the government are not being effectively realized.   Some
assistance is being given through the cooperative system to
the modernization of agriculture, but this seems to be only
limited.   The movements' welfare aims, however, are hardly
being carried out.   The farmers that benefit from subsidised
state assistance channelled through the cooperative system
are the middle income class.   The poorer farmers so far
seem to be missing out on the benefits.   Overall, less than
10 percent of all farmers are members of societies.

   On the financial aspects of the societies, the account-
ancy system was found to be inadequate.   The accounts are
not presented in a conventional way and fail to make adequate
provision for doubtful debts, depreciation and stock changes.
They also lack a flow of funds statement which would help
make the financial position clearer now that the societies
are undertaking multi-purpose activities.

   The concluding chapter of the thesis gives some recommend-
ations for remedial action.   More specifically, it makes
three main recommendations.   First, that the efficiency of
primary level cooperative management should be improved
through incentive payments and greater training, especially
in financial skills.   Second, that the societies should be
granted greater flexibility to respond to market conditions,
in offering higher prices or in paying higher interest rates,
so as to attract more membership and greater loyalty from
their members.   Lastly, that much more extensive research
should be carried out on agricultural cooperatives in
Thailand.

Widjaja, Kartika
Demand for Meat in Jakarta: An Econometric Analysis
93pp. 9 tab. 3 fig.
This study aims to quantify the relationships between

consumption, prices and incomes in the demand for individual meats in Jakarta.

Using consumer demand theory and previous studies of meat demand, important factors in model specification are considered.

A system of meat demand functions is set up in which per capita consumption is hypothesised to be:

(1)   negatively related to own price;

(2)   positively related to price of substitutes; and

(3)   positively related to income.

Using quarterly data of 48 observations (1966-67) and a GLS estimator, double log functions are estimated.   Data limitations prevented estimation of chicken demand equations and meaningful goat meat equations.

The models generally support the stated hypotheses. Interpretation of the results is cautious, because of data limitations.

The results suggest that beef and pork demand are own price inelastic and pork is price elastic while both income elasticities are less than unity.   Some evidence of partial adjustment in beef consumption was observed.

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