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Micro-level Studies and Policy Analysis: Experiences from Tonga and South Kalimantan

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Policy-oriented studies at the household and village level are undertaken by researchers from a range of disciplines. In this paper, we focus on two such studies, one conducted in Tonga by agricultural economists, the other in Indonesia by a geographer. While there are differences in disciplinary approach, some fundamental requirements emerge for the successful integration of micro-level research into the policy-making process.

1. Introduction

Studies at the household and village level are undertaken by researchers from a range of disciplines - anthropology, sociology, geography and economics, to name a few. Methods used by a particular researcher or team are largely governed by the theoretical foundations of their discipline. However, many share the common aim of deriving recommendations for government policy-makers.

In this paper, we discuss two research projects: the first, conducted by a team of agricultural economists (including the first author) in Tonga; the second, by a geographer (the second author) in South Kalimantan, Indonesia. Both involved the intensive collection of data from samples of farming households, and the results of both have been used in attempts to influence policy-makers.

Following a discussion of policy-making processes in Tonga and Indonesia in section 2, we briefly describe the two projects in section 3. Some insights, obtained during the course of the research and which are relevant for policy-making in the two countries, are examined in section 4. We conclude in section 5 with a comparison of the two approaches used and some comments on the potential of micro-level research to provide inputs to policy-making.

2. Policy-making in Tonga and Indonesia

2.1 Tonga

In Tonga, elected representatives exist at village, district and national levels. District and village officials serve as a link between government and people, passing on directives, making representations to government on behalf of communities, and handling official duties such as tax collection. Regular village meetings are held to discuss such issues.

However, despite sporadic attempts to involve target groups through regional development workshops, policy formulation and implementation is very much a 'top-down' process. In the agricultural sector, in particular, government policies frequently take the form of directives which are relayed, via the ministries concerned, to District and Town Officers, who are expected to see that they are acted upon. Research priorities in agriculture are set by research scientists, while District Agricultural Committees liaise with Extension Division personnel to set planting targets for particular crops, in accordance with national planning objectives. There is little delegation by the central government for planning or general economic management, with quite routine decisions made by Cabinet. There are no political parties and, in practice, the King has near absolute power. Traditional respect and obeisance are still strong and serve to discourage dissent. Foreign businessmen wishing to undertake major projects are regular visitors to His Majesty, with proposals to be undertaken as joint ventures with members of the royal family.

Officially, at least, policy formulation is closely

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tied to the preparation of formal planning documents. The Central Planning Department (CPD) has overall responsibility for coordinating the preparation of plans, in consultation with the relevant ministries. The CPD also prepares project and program proposals which must be submitted to two 'Development Committees' for review, prior to Cabinet submission. Given this apparently rigorous procedure, it might be expected that only those projects with a high chance of success would be accepted. Nevertheless, project results are often disappointing. In some cases difficulties stem from lack of understanding of the objectives of the intended beneficiaries, or overestimation of their ability to commit resources such as family labour.

The combination of private ventures supported by the King, and foreign aid tied to specific programs and projects, means that priorities at household or village level are neglected. Reliance on external funding sources carries the danger that planning can become hostage to the priorities of external funding agencies. Programs and projects tend to influence policy-making, rather than serving as a means of implementing policies that have been formulated. In agricultural research and extension much effort is devoted to servicing three or four major projects involving relatively few commercially-oriented producers. Overall, research and extension in Tonga appears to have had limited impact on farmers.

2.2 Indonesia

In Indonesia, which has such diversity of ecological and ethnic zones, central policy-making is carried out in Jakarta, largely by Javanese, who have little knowledge of conditions in Kalimantan or other 'outer islands'. An hierarchical administrative system has been devised, from the head offices of the respective ministries, through provincial (level 1), district or *kabupaten* (level 2), regency or *kecamatan* (level 3) to the village. While major policy decisions are taken at the centre, implementation within a province should permit some flexibility. In theory, information should move in both directions, with workers at *kecamatan* level being aware of the needs and capabilities of villages, and able to convey such information to the sectoral agencies for transmission to provincial offices. In

practice, however, level 3 workers are simply instructed in implementing official policies and passing information down. If villages are widely dispersed and difficult to reach, *kecamatan* staff may rely on second-hand reports from village heads (obtained at regular meetings), rather than from personal observation. Similarly, agricultural extension officers (normally young and from outside the region), are not provided with transport, and are more likely to concentrate on villages nearer the *kecamatan* centre. Agricultural officers based in district headquarters or the provincial capital will only occasionally visit outlying regions. If they do, they are likely to spend a few hours talking only to the officially appointed village heads, possibly leading to a distorted picture of the local economy and the potential impact of policies. Fear for their jobs results in officials playing down problems and down-turns in production, especially of the main rice crop.

Planning institutes (BAPPEDA) exist at both district and provincial level to enable co-ordination between sectoral policies and prevent overlaps and inconsistencies. However, the planning institutes are weak and may easily be overruled by stronger sectoral agencies. In Kalimantan, the latter are the Departments of Forestry and Transmigration, and to a lesser extent, Public Works. Where conflicts occur, and they are frequent, national priorities such as transmigration and non-oil exports (here meaning timber products) may be invoked to override other considerations.

The highest-ranking provincial official is the Governor. Usually an army officer from Java, his aim is to push through central government policies. South Kalimantan is in a better position than many provinces, in that the governor is a local Banjarese, and he has appointed a task-force of young academics to assist him in lobbying the central government to secure more funds for local development. Nevertheless, the information gap remains, with academics having insufficient funds or time to engage in primary research in rural areas. As the local university does not offer post-graduate programs, the final-year fieldwork of Sarjana students is regarded as just an exercise, not taken seriously by planners or policy-makers.

2.3 Information for Policy-Making

In both Tonga and Indonesia, planning involves little input from the village level. First-hand knowledge of particular rural areas among policy-makers may be quite inadequate, and in both countries they rely heavily on official statistics.

In Tonga, population censuses are conducted every 10 years and an Agricultural Census was carried out in 1985. The Statistics Department is also involved in other surveys from time-to-time. Data on landuse, agricultural production and market throughput are collected by the Ministry of Agriculture, Forests and Fisheries (MAFF). Most area and production figures (including those in the Agricultural Census) are based on farmers' own estimates. The Agricultural Census Report (Statistics Department 1988) is qualified at several points by warnings regarding the dubious quality of the data (e.g. pp. 27, 29, 38, 43).

The market survey data collected by MAFF have also been criticised for inconsistency and unreliability. Hardaker (pers. comm. 1990) computed indexes of total volume for 1976-88 and total value and prices for 1982-88, from published market reports. He noted that increases in value of market throughput appear to be almost entirely due to price inflation. Volumes appear to have fluctuated greatly, with the 1988 figure almost half that of 1976 and 1987. While 1988 may have been a poor year, the results are counter to observable expansion in the size of the marketplace. Moreover, the price data seem to be suspect. The Statistics Department also records market prices, and there are substantial discrepancies (up to 400 per cent for tomatoes in 1982) between the two sets of prices.

In Indonesia, village level data such as crop areas and production figures are collected on a routine basis, and passed from level-to-level with modifications along the way. There are always several conflicting sets of statistics, finally worked on by the Central Bureau of Statistics in Jakarta. Some check is made by less frequent large-scale data gathering, such as decadal Agricultural and Population Censuses, cost-of-living surveys and general economic surveys. These may also be unreliable where enumerators have little incentive to ensure

accuracy, are simply corrupt, or where sample sizes are too small to ensure representativeness. Moreover, when nationwide surveys are carried out infrequently, important changes may be noticed late or not at all (for instance, the rise and fall of the important rattan carpet industry in the north Hulu Sungai (South Kalimantan) took place between censuses and will be largely unrecorded, though mentioned in local statistics).

Census data and other official statistics also tend to mask the important and multifaceted roles of rural women. 'Decision-makers have been hampered by inadequate information systems that have misrepresented rural women's productivity. Resultant rural programs have barely touched on these areas of women's work...' (Fleming with Tukuafu 1986, p. 62). Village heads, together with most officials who have contact with villagers (from extension officers upwards) are almost without exception, male. Consequently, women's issues receive little airing.¹

Little personal contact with villages and inadequate data tend to mean that government officials consider semi-subsistence producers to be rather backward. This is particularly the case when farmers are reluctant to adopt improved technologies. In the central Hulu Sungai of South Kalimantan, government efforts to encourage double-cropping of rice (which would be possible with the available irrigation) have been largely ignored, giving rise to comments about laziness and ignorance. In fact, the farmers' behaviour is very rational. Most are share-croppers, which considerably reduces their return. An alternative enterprise, rubber-tapping, brings a daily income in the dry season and the work is usually finished by mid-morning, while rice workers put in many more hours. Few farmers double-crop and, accordingly, rats are a greater problem for dry-season crops, resulting in further discouragement.

Both Tongan and Indonesian development plan-

¹ This is particularly the case in Indonesia. In Tonga, there is a women's section in the extension service, but they tend to concentrate on different issues from their male counterparts - although many village women have full responsibility for their household's crop production (especially as increasing numbers of men seek work overseas).

ners recognise the need to gain a better understanding of conditions at the household and village level. Several rural development workshops have taken place in Tonga, and MAFF has given at least formal recognition to the farming systems research and extension (FSR&E) approach. A limited program of on-farm trials has been conducted, involving collaboration between research scientists, extension officers and farmers (Gyles, Hardaker, Kami and Speijer 1989). In Indonesia, the agroecosystem approach to rural research (Conway 1985) has been used to develop a better comprehension of ecological and agronomic possibilities in the tidal swamp areas of South Kalimantan (KEPAS 1985). However, much more remains to be done.

3. Description of the Studies

3.1 Tonga

The first author was involved in the detailed study of four villages over a 12-month period, as part of the South Pacific Smallholder Project funded by the Australian Centre for International Agricultural Research (ACIAR). Data were collected on a regular basis concerning farm-household resources and productive activities, income and expenditure, food consumption and individual time allocation. Additional studies were undertaken in some or all of the surveyed households, including collection of attitudinal information, investigation of nutritional status, a study of women in the village-based economy (Fleming with Tukuafu 1986), and analysis of the relationship between soil fertility and cropping practices (Potter 1986). The Project involved the most thorough and intensive data collection ever undertaken among village households in Tonga.

Analysis of the data took several forms. Tabular and graphical summaries and results of some simple statistical techniques (production functions, inequality measures) were presented in the Project Report (Hardaker, Delforce, Fleming and Sefanaia 1988) and related publications (e.g. Delforce 1988). More complex analyses of subsets of data were undertaken by honours and graduate students at the University of New England. Kingston (1985) and Drilon (1987) estimated household expenditure systems, and Wilson (1987) examined factors affecting credit usage in the survey villages. Delforce

(1990) then used both econometric and mathematical programming in an empirical application of farm-household economic theory, aimed at identifying policy options for improving the performance of the smallholder sector. Options in the areas of land, labour, capital and credit, technology and terms of trade were assessed with the aid of the economic models.

The farm-household modelling was an interesting academic exercise, but its value in terms of policy analysis is less clearcut. While the formal analyses could be dismissed as having merely confirmed the findings published two or three years earlier in the Project Report, it seems likely that the modelling has given these findings additional credibility. Considerable care was taken to develop a plausible model, rigorously derived from the micro-level data, so that policy makers could follow the logic and see how a hypothetical policy change might affect the 'representative' farm-household.

The Project was not just an exercise in data collection and reports. Those involved from its inception have since maintained close contact with Tongan agricultural planners and policy-makers. A follow-up component of the project ran from 1986-89, focusing on promotion of the FSR&E approach and preparation of a Handbook (Gyles, Hardaker, Felemi and Verspay 1989). Both the Handbook and FSR&E have been formally adopted by MAFF. Furthermore, four Tongans who had assisted with the project were brought to the University of New England, either for short study periods or graduate training.

Research findings were communicated at a workshop in Tonga during May 1988, attended by senior agricultural officials from both government and private sectors. Despite considerable interest, the consensus which emerged was that to influence policy we should be talking to politicians, not public servants and commercial farmers. A follow-up 'policy workshop' was mooted, but never organised. However, the project leaders (Hardaker and Fleming) later participated in the World Bank Agricultural Sector Review, using project data in support of their recommendations. That they had conducted intensive household-level research gave them high credibility in discussions with policy-makers (J.B. Hardaker, pers. comm. 1991).

3.2 South Kalimantan

In South Kalimantan, Potter has conducted village level research since 1982. Three villages were selected for detailed study, representing three distinct, ethnic-based systems of management in the upper Riam Kiwa valley. Banjarese, Javanese and Madurese groups were represented. Several visits were made to each village at different times of the year, and a sample of 20 per cent of farmers was followed through three cropping seasons. Data were collected formally at household level on production, expenditure and time/labour allocation, and informally on attitudes to particular vegetation types and perceptions of soil deterioration. Soil samples were taken in a range of micro-environments in each village, to compare effects of management practices and the likely impact of different government policy options.

Meanwhile, the lowland rice-growing district of the Hulu Sungai has been the focus of a related, long-term study. Here the main aim has been to ascertain the reasons for 'out-migration', which has characterised the area for the past 130 years. It was hypothesised that difficulties of water control in some areas might be important, as well as continuing economic problems for those owning too little land. While an in-depth survey of Dutch literature sources has been undertaken to place the present situation in context, studies in four contrasting villages have aimed to examine both major variants of the present economy and its constraints, and the kind of migration behaviour which has ensued. Current migrations include seasonal movement to a large rice harvest (Gambut), as well as permanent relocation to other rural districts and urban areas of Banjarmasin. Follow-up surveys in these areas were also undertaken. People were questioned in detail about their village economic situation, reasons for moving and, in the Banjarmasin survey, their present economic position. (An interesting subset from those interviewed during the Gambut harvest was a group of 94 female-headed households.) It was possible to look at out-migration on several scales: longitudinally, in terms of flows over time to specific locations; at household level, from the viewpoint of people still living in villages, but with family members away; and in terms of the wider region and its labour networks.

The information derived from the detailed village-level studies has been analysed using simple statistical procedures. For example, consumption figures from the upland villages were categorised according to Sayogyo's Poverty Line, universally understood by Indonesian policy-makers (Sayogyo 1975). Using that benchmark, not only did the fortunes of all three villages improve over the period, but the Banjarese shifting cultivators did not perform very differently from those using the more intensive Javanese and Madurese systems. In lowland areas, detailed village studies provided information to complete a broad general picture of occupations, mobility and labour markets.

Communicating results to policy-makers has been carried out in a less formal manner than in the Tonga case. The main avenues have been contacts with influential academics in the governor's 'think tank', seminars given in Indonesian at the local university and at the Indonesian Institute of Sciences in Jakarta, and discussions with local officials at all levels. Part of the work on the Hulu Sungai has recently been published in English (Potter 1993) and publication in Indonesian is planned. An early version of the upland work has already been published in Indonesian. However, discussion of findings at the local level is not the same as reaching policy-makers in Jakarta: that is one of the problems with Indonesian research.

4. The Household and Village Economies: Lessons for Policy Makers

Within the space limitations, it is not practical to attempt a detailed description of the household and village economy of Tonga or South Kalimantan.² Instead, selected areas of particular relevance for government policy will be highlighted.

4.1 Tonga

4.1.1 Land

Tongan lands are divided into estates controlled by either the King, other royal family, nobility or the government. The greater part of each estate is

² For Tonga, see Hardaker *et al.* (1988) and Delforce (1990). Potter's major work in this area is still in preparation, but for aspects see Potter (1987a, 1987b, 1993) and Potter and Hasyimi (1989).

subdivided into town allotments for housing, and tax (or bush) allotments for farming. By law, every male over 16 years is eligible to apply for both. However, population growth and an apparent reluctance to allow additional land registration have resulted in less than 35 per cent of eligible males being allocated tax allotments (Central Planning Department 1981, p. 21).

Official statistics give little indication of the true complexity of land access rights in rural Tonga. Enquiries at household level reveal that many registered owners do not cultivate land because they are temporarily or permanently away. In spite of legislative changes, informal arrangements remain the most common means of ensuring that most 'landless' rural households have at least temporary access to some land, and that few allotments remain completely idle. However, informal arrangements mean that the majority of growers do not have security of tenure on such land and this restricts the range of crops they are willing to grow. Long-term cash crops (e.g. vanilla) are unlikely to be planted, and many growers are reluctant to plant even short-term cash crops. There is little incentive to maintain coconut palms unless a specific agreement has been reached. Fuelwood supplies are also becoming increasingly scarce (King 1986). Land registration and leasing procedures would improve tenure security and help alleviate some problems.

4.1.2 Labour

Time allocation studies carried out in the four survey villages showed that both men and women were relatively fully occupied, but women generally had the least free time. Adults worked an average of more than 50 hours per week (including housework), while women aged 25-44 years averaged nearly 65 hours per week. Women were heavily involved in productive activities, including agriculture, fishing and handicraft production. Recommendations arising from the household-level studies include the introduction of measures to reduce inflationary pressure on wages. Increases in rural labour productivity are also necessary if agricultural performance is not to be adversely affected by households' access to alternative employment opportunities in Tonga and overseas.

4.1.3 Farming practice

Traditional farming is based on intercropping and a flexible pattern of fallow and crop cycles. These practices make the collection of reliable landuse data particularly difficult. In the Agricultural Census, for instance, farmers were asked to estimate areas under particular crops. Similar questions put to Project sample farmers were later found to be quite inaccurate, compared to the data obtained through detailed mapping of individual farms. Moreover, prior to the Project, estimates of crop budgets tended to be based either on Research Farm data, or on farming experiences and recollections of individual MAFF staff. There may be considerable variation between alternative sources of information on yields and labour input (Delforce 1988). There may also be a marked contrast between the figures used by planners and what farmers actually do.

While it would be unrealistic to suggest a major expansion of agricultural research, some improvement could be made in ensuring that it is relevant to the needs of smallholder farmers (e.g. adaptive research on higher-yielding varieties of staple crops). Data analysis indicated that one of the most useful advances would be a cheap, easy to implement system of maintaining soil fertility which significantly reduced the duration of fallow. Increases in crop yields would also have obvious benefits. For export and other cash crops, most benefits would accrue to the more commercially-oriented (and usually better-off) farmers.

4.1.4 Differentiation within and between villages

Contrary to popular belief, Tongan villages are by no means egalitarian. Considerable inequalities were found, both between villages and between households within villages, in terms of resource distribution and participation in agricultural activities. This points to a need for flexibility in the use of policy instruments. Substantial variations in factor productivity were also evident, suggesting that potential exists for expanding agricultural production through the dissemination of successful techniques and work practices.

4.2 South Kalimantan

4.2.1 Land

There are substantial regional differences in land availability: average cropped areas are three to four times higher in the upland Riam Kiwa than in the lowland wet-rice area of the Hulu Sungai. More significantly, while all upland land is 'owned', levels of land ownership in the lowland villages ranged from 24 to 77 per cent. Hulu Sungai land tends to be sharecropped or 'borrowed' and this can have an effect on rice intensification possibilities. Land shortages exist also in the uplands: in one Madurese village (established in 1946) there is no longer land for the next generation, who must seek to create a satellite settlement elsewhere. As all land is under ownership of particular villages, newcomers must obtain permission to settle.

Recent government encouragement of plantation forestry projects in the uplands has restricted opportunities for spontaneous migration. Although recognising 'permanent cultivation', officials do not recognise ownership of fallow land, and perceive shifting cultivation as both temporary and backward. Plantation forestry has put pressure on Banjarese shifting cultivators, who grow dry rice, peanuts and bananas, and whose burning practices are feared by the plantations. They are being forced to move further from traditional sites to find land. It is not understood by the Forestry Department that such villages have been practising land rotation in secondary forest and scrub, over well-defined territories, for generations. Failure to recognise village concerns may jeopardise the plantations: a large area was burned during the drought of 1991, perhaps accidentally.

4.2.2 Labour, livelihoods and farming practices

There has been discussion among government officials (many of whom are Javanese), about the kinds of farming practices common among Banjarese in both upland and lowland areas. Javanese practices, developed in quite different historical and ecological circumstances, are always assumed to be superior, while Banjarese are seen as lazy, with little attachment to the soil.

In the swampy lowlands of the Hulu Sungai, where the layer of fertile soil is thin and newly deposited

in seasonal floods, the hoe is the universal implement. Ploughing has never been adopted, although tried by the Dutch in 1906 with disastrous results. In the uplands, soils on slopes are little disturbed by the digging stick, following burning of the scrub. Javanese and Madurese in the district plough with cattle, an activity likely to produce serious erosion. This is especially true of ploughing three times to remove rhizomes of *Imperata cylindrica* or *alang-alang* grass, and leaving the steep slopes bare at the beginning of the rains. Fertility has now declined so severely in the Madurese village that dry rice is no longer grown: some villagers have access to terraced wet rice in narrow valleys, but others must sell bananas to buy rice.

Another feature of the Banjarese systems has been their variability. Unlike the intensified Javanese agriculture, Banjarese upland dwellers in the dry season will be part-time miners and collectors of forest products where possible. In the lowlands they cut rubber, raise ducks, or produce handicrafts. There will always be various income sources, some of which require family members to travel long distances (e.g. Gambut). These long-established traditions of diversification and mobility, offering opportunity but also risks, are likely to slow farmers' acceptance of government agricultural policies involving intensification.

4.2.3 Differentiation within and between villages

Ethnic differences have already been mentioned as producing differentiation and different responses to policy initiatives. However, among the majority Banjarese in the Hulu Sungai, there is also a major geographical divide, between the slightly more elevated alluvial villages at the base of the mountains, and more swampy settlements along the river. The former produce rain-fed lowland rice in the main rainy season, using some irrigation. In the latter, flood waters only allow farming in the 'dry'. Fishing and handicrafts are major occupations, and these villages have supplied a high proportion of recent urban migration to Banjarmasin. Alluvial villages are more likely to send wives, widows and teenagers to the August harvest at Gambut, having reaped their main rice crop in April; the riverine villages harvest their rice in October, and keep busy with other activities.

Within all villages there is clear differentiation by class and income. Banjarese tradition, evident in permanent wet rice or *sawah* fields, has always identified a hereditary class of farmer/landowners and a poorer landless group. In the more egalitarian upland society, 'stage of life' cycle is more important, with new young households and the aged most likely to be poor. Female-headed households everywhere have a hard struggle, especially those with only daughters. This latter group identified in the Gambut survey possessed less land, had lower rice yields, and generally a lower income than the rest of the migrants surveyed.

4.2.4 Conflicting government policies

Government policy, particularly in the uplands, is implemented by several competing departments, which convey conflicting messages. A general tenet is that shifting cultivation is backward, environmentally degrading and economically marginal. While departments are agreed on the need for eradication of the system, there is disagreement as to the means.

The agriculture department seeks to intensify production by promoting cow and plough preparation of the land for cash crops (mostly peanuts) with inputs of fertiliser and, if necessary, pesticide. Rice is also favoured: wet rice, wherever possible in small valleys, or upland rice with fertiliser inputs. Permanent tree-crops are encouraged to some extent. There is no program for agroforestry and little acknowledgment of the potential for erosion using cow-plough technology. The livestock department has supplied cattle to some villages, especially those with transmigrants.

The land all comes under the jurisdiction of the forestry department. The *alang-alang* grass is the result of large scale clearing and cash cropping, followed by burning to ensure young palatable cattle feed. Early reforestation programs, mainly with eucalypts, largely failed because of dry-season fires. Forestry officials regard shifting cultivators as destroyers of forest and would prefer the area to be uninhabited. Under the recently-established industrial forest plantations (HTI) program, the aim is to reforest 50 000 hectares of grassland and scrub country with fast-growing exotics. The belief is that shifting cultivators are transitory and

that people will benefit from the new work provided. But these villages are permanent and centuries old, and most Banjarese have rejected plantation work, citing very low wages and long hours. Instead, Javanese transmigrants provide the labour force.

The public works department has long had a plan to construct a dam in the Riam Kiwa valley to augment the supply from the Riam Kanan reservoir to the south. That reservoir was constructed during the 1970s and has only partially filled. Meanwhile, a large irrigation canal is under construction from the Riam Kanan dam to irrigate the Gambut wet-rice area, where current practice is to grow one crop per year of local rice varieties. With irrigation, intensification of production can occur, in line with national policy. The irrigation system, long planned, puts more strain on the limited capacity of the reservoir, hence the revival of the plan to build another dam.

When Potter began working in the area, around 1983, there was much fear among villagers about the likely effects of the dam. A survey recommended that it not go ahead because of possible social disruption. In addition, the mining department was interested in coal supplies still existing in the basin, which it wanted to mine. That has not happened, the population has meanwhile increased, and the forestry department has just established thousands of hectares of trees. The story now is that the dam will go ahead, but the timing is uncertain.

Careful study of the local economy at household level over a five-year period led to the conclusion that the Banjarese system of agriculture could be sustained in the long-term, if it were allowed to persist. Yields of upland rice, although annually variable, were generally sufficient for subsistence. Farmers did not make swiddens in primary forest, using instead scrub which, after one year's crop, would be fallowed for at least five years. They knew that too-frequent working of the land would lead to further incursion of *alang-alang*. Some off-farm activities, such as diamond mining, caused erosion and might be unsustainable, but there was scope for improving the agricultural system, incorporating a bigger variety of tree crops and introduc-

ing wet-rice in the valley floors. The percentage of the village sample whose incomes were below the poverty line declined sharply during 1983-86, with improvement in rice yields and increased prices for peanuts. Coffee is now being planted on several farms, maybe in recognition that permanent tree crops might receive compensation if overtaken by new land uses.

5. Discussion and Conclusions

Policy recommendations which can be derived from micro-level analysis were discussed in section 4. In the case of Tonga, an important conclusion was that smallholders have the capacity to generate increases in production, marketed surplus and agricultural incomes required for achievement of sustainable economic development. Analyses, conducted both with and without farm-household models, showed clearly that feasible policy options exist, which should help to improve the performance of the agricultural sector, and smallholders in particular.

In South Kalimantan, recommendations relate to the sustainability of existing systems and the likely social impact of various changes taking place. Indonesia is not unique in that planners envisage 'development' in terms of large projects and greater centralisation of activity, so that small farmers and handicraft producers are squeezed out or forced into urban areas. In upland development, whatever land-use decisions finally prevail in Banjarmasin or Jakarta, it is unlikely that the farmers of the Riam Kiwa will be consulted. Resettlement is inevitable if the dam is constructed, and while reforestation would have environmental advantages, its social impact is unlikely to be harmonious.

The studies described here represent two distinct approaches to the collection and use of data from households and villages. For convenience, the approach used in the Tongan project will be labelled as the 'economist's approach', in contrast to the 'geographer's approach' of the South Kalimantan study.³ The former involved a concentration on the farm-household as the unit of analysis, although for particular surveys the focus narrowed to the individual household member. The organising framework was the basic farm-house-

hold model of Figure 1. 'One-off' surveys were designed to provide information on the long-term characteristics of the farm-household unit. Flows between farm, household and the labour and product markets were measured on a regular (daily or weekly) basis, via crop and other activity diaries, and time allocation, income and expenditure and food consumption surveys. All data were gathered by structured questionnaires. Given the volume of information, and the need for comparable 'observations' for statistical purposes, less formal approaches are unlikely to have been satisfactory. Similarly, data analysis was mostly via formal techniques such as statistical summaries and economic models. While the data were split into quarterly observations for some purposes, in general all observations were pooled, to provide a single 'snapshot' view of smallholder agriculture.

The economist's tendency to build formal models is often regarded with suspicion. Certainly, the approach can be suspect if it becomes a substitute for informed reasoning. On the other hand, those who eschew model building may make flawed judgments, based on implicit assumptions about constraints and opportunities. Model building exerts a strong discipline and forces explicit assumptions.

In South Kalimantan, the scale of enquiry shifted between farm-household and regional levels. The possibility of conducting related studies in several locations and returning often to survey areas gave the study a dynamic orientation. Movements of population within (and outside) the region were chronicled, while changes over time - both seasonally and annually - were also emphasised. Formal survey techniques were used, but were supplemented by informal discussion. Similarly, results of statistical analyses were supplemented by descriptive material based on informal enquiries. No model-building was undertaken.

It would be unproductive to judge the relative merits of the 'economist's' versus the 'geographer's' approach. The two studies described were

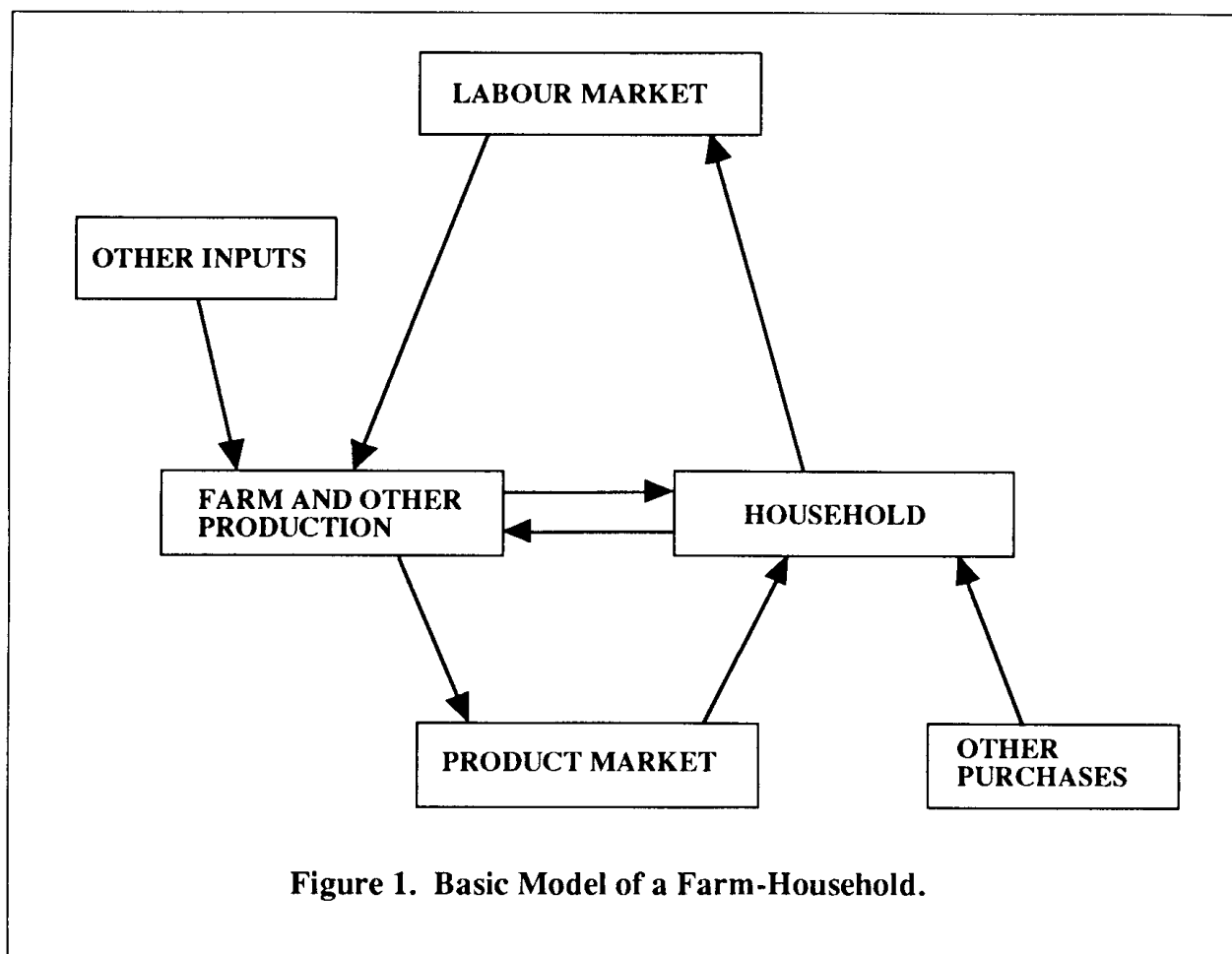
³ Other researchers working within these two disciplines may adopt somewhat different methods. The labels are not to be seen as generalisations, but rather, shorthand descriptions specific to the two cases outlined.

quite different in character. Moreover, a multidisciplinary perspective is to be preferred for both individual and team efforts. The Rapid Rural Appraisal (RRA) technique, for instance, ideally involves specialists (local as well as foreign) from many disciplines, and can provide an excellent overview of a region and its problems. However, this must be followed by longer-term, intensive analysis of key issues. The studies described in this paper illustrate that those involved in academic research must spend adequate time in an area if household economies are to be understood. If possible, it is advisable to return often to gauge the impact of changes. Farm-household economics is a useful framework within which to order the enquiry, but policy recommendations can be derived without complex formal models. Moreover, researchers should also move beyond the household to the village and the wider region in searching for explanations.

Making use of survey results to influence policy-makers is probably the most difficult part of re-

search, especially in highly centralised and hierarchical systems. Sending a few copies of a report is not likely to have much effect. This is especially true in non-English-speaking countries, unless the work is translated. Other avenues need to be explored.

To be effective in policy terms, the intensive study of household and village economies needs to be adopted by government agencies and integrated into policy-making. This may require major adjustments, particularly where government officials have fixed ideas about what rural communities should be doing. While it may be unrealistic to suggest that policy makers should participate directly in intensive data collection spanning several months or years, even a short-term involvement, for instance in RRA, is likely to have considerable impact (the South East Asia Universities Agricultural Network has organised several studies along these lines). An unambitious program of micro-level study in a few key locations could then follow, generating a wealth of relevant information within



the limitations of local research resources. In short, the practice of spending time in villages, learning about the household and village economy and listening to local people, must become standard practice among all involved in the formulation of policies affecting those areas.

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