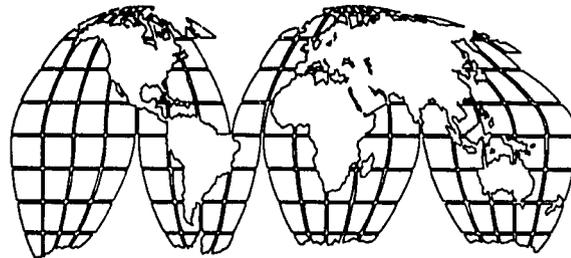


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## **Assessment of Contract Farming at Lam Nam Oon, Thailand**

*A Combined Effort of USAID  
and The Royal Thai Government*

April 1994

**U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT**

**ASSESSMENT OF CONTRACT FARMING  
AT LAM NAM OON, THAILAND:  
A COMBINED EFFORT OF  
USAID AND THE ROYAL THAI GOVERNMENT**

DEVELOPMENT ALTERNATIVES, INC.  
APRIL, 1994

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## GLOSSARY

### Acronyms

CDIE	Center for Development Information and Evaluation
LNO	Lam Nam Oon
RTG	Royal Thai Government
FAO	Food and Agricultural Organization
IRD	Integrated Rural Development (Project)
ATT	Agricultural Technology Transfer (Project)
APM	Agro-Production and Marketing (Program)
WUG	Water User Groups
BAAC	Bank for Agriculture and Agricultural Cooperatives
SAT	Specific Assignment Team
RID	Royal Irrigation Department
CDD	Community Development Department
O&M	Operations and Maintenance

### Foreign Words

amphoe	District
rai	Measurement of area equal to 0.16 ha., or 0.40 acres
baht	Thai monetary unit; approximately 25 baht equal US \$1
Khun	A term of respect, used similarly to 'Mr.' or 'Ms.'
sabai	To rest securely

## EXECUTIVE SUMMARY

In the national plan of many developing country governments, there are specific objectives related to agro-industries. The public sector has an interest in promoting contract farming primarily as part of its objectives for development of agro-industries.

Thailand has established an excellent record promoting a changeover from subsistence farming among its rural population to a commercialized one. Its agribusiness sector is particularly noted for its strong export-orientation and its aggressive efforts to attract foreign investment. As evidence of its success among nations, Thailand has moved up to fifth place among world exporters of value-added, processed foods.

This document relates the development of contract farming at one site in Thailand, explains the strategies employed by USAID and the Royal Thai Government to accelerate the agro-economic advancement of the population, reviews the significant outcomes and impacts of the growth of managed arrangements, and recommends improvements in project design for strengthening the agribusiness sector in developing countries. This assessment is part of a larger review of USAID's agribusiness projects worldwide, undertaken by the Center for Development Information and Evaluation (CDIE).

Most of the growth of managed arrangements--a term which is hereafter used synonymously with contract farming--took place *after* the cessation of funding from the U.S. government, during a period when all moneys were received from the Royal Thai Government. However, the genesis of the activities that were to succeed so spectacularly came *during* the period Lam Nam Oon received overseas aid and technical assistance through USAID project grants. Thus the earlier projects built the foundation for future growth.

The USAID projects focused on the strategies of institution building and enterprise development, in order to transfer to government officials the knowledge and techniques necessary for the extension of production and marketing of export-oriented industrial crops. However, having explored the feasibility of growing certain crops in one particular setting, the setting of Lam Nam Oon, the public sector's mission was to "pass the ball" to the private sector. The agribusiness firms participated in determining which crops to grow in order to meet the requirements of customers, took the lead in teaching outgrowers new technology, and worked with them to optimize returns for both parties. The firms purchased the produce, generally at prices agreed beforehand. These arrangements were coordinated by the Lam Nam Oon staff (and in earlier times, by the marketing specialist or consultant) so as to gain maximum benefit to both companies and outgrowers. The close cooperation among the three parties convinced the private sector firms to confidently invest in agro-industrial crop production to achieve their target goals.

Starting with a handful of farmers in 1982/83, the level of participation in contract arrangements increased to 171 farmers two years later, and reached in excess of 4,000 households by 1990/91. At that point in time, the average net income per unit area for seed farmers had more than tripled, while

the average net income per unit area for farmers planting crops for processing (primarily tomatoes) had almost tripled. Firms were generally enjoying comfortable profit margins, too.

Recent experience shows a continuing increase in options among Lam Nam Oon farmers for market outlets for their produce as well as profitable returns to both parties year after year, thereby justifying an optimistic assessment of the socio-economic sustainability of this project over the medium-term. However, one particular weakness in project design and implementation has also struck a chord with farmers and firms, and that is the lack of foresight with regards to the teaching of, and ensuring, safe spraying practices while performing in-field management. Farmers continue to be afraid of the chemicals they use, most likely because the full range of precautionary measures has not been taken.

In an environment where irrigated agriculture has existed for just a few years, it is extremely difficult to start such a sequence of events. A successful effort requires that government understand that crop identification be demand-driven. Project officials must possess (or gain) the confidence and skill to perform preliminary market surveys and company searches, and to build bridges to those firms. The public sector, and particularly officials that control the water on-site, the companies, and the farmers must form links and must cooperate together in order to structure the production and marketing of high-value crops within fair bounds, so that both sides have incentive to continue to work together. While contract farming is not the only alternative for entwining a farmer-private sector relationship, if it proves feasible, as happened at LNO, then the agribusinesses themselves can serve as the engine of growth for the rural population, and the fortunes of the farmers will be more closely tied to the overall growth of the national economy.

LNO is also important because it presents empirical evidence that contract farming can be beneficial to small farmers, and that it need not negatively impact the efforts of women to have greater control over their lives.

The best way to incorporate the full range of expertise that the private sector has to offer in spearheading an agribusiness project is to follow these lessons learned:

- Proceed with the understanding that the government official's role is crucial in engendering trust between farmers and firms;
- Recognize that contract production is not by its nature biased towards any groups;
- Establish a core working unit on-site. This unit can troubleshoot problems as they arise, rather than relying upon multiple committees;
- First, get familiar with the farmers, and only then proceed to coalesce a specific assignment team;
- Recognize that institutional strengthening and training is crucial in fomenting the understanding of the government's role and their ability to negotiate with the private sector, and further recognize that training can best be accomplished by working side-by-side with specialists possessing relevant firsthand experience;
- Set a realistic time horizon for the accomplishment of goals;
- Perform crop-testing on-site, and with a market orientation, i.e. a view that parallels the concerns which roust the private sector;
- Throughout the project, keep in mind that water control is number one in the minds of the private sector;

- Set up a monitoring unit in the post-project period, in order to flag the time when new crops must be identified to keep tempo with the changes in that locale's comparative advantage;
- Incorporate preventative measures to protect the populace from the hazards of pesticide sprays.

## CHAPTER ONE

### PROJECT DESCRIPTION AND SETTINGS

#### COUNTRY SETTINGS

##### Macroeconomic Settings

A sound economic base developed in the 1970s and 1980s allowed Thailand, home to 55 million people, to enjoy one of the world's fastest growth rates during the late 1980s. Thailand developed from a country with national income well below \$100 a year in the 1950s, to an industrializing economy<sup>1</sup>, an economy that generated roughly \$1,420 GNP per capita in 1990. In the 1960s, Thailand's growth exceeded 8 percent per annum. During the 1970s, the Thai economy showed average GDP growth of over 7 percent a year, which was quite impressive given the first oil price rise in 1973. After 1979, however, when the second oil crisis occurred, Thailand did not fare as well. External debt rose fivefold from 1978 to 1984. Economic expansion slowed considerably as the economy stagnated during 1983-1985. In the later 1980s -- the period which most interests us because it coincides with the flourishing of the Lam Nam Oon (LNO) project, Thailand experienced the strongest economic rebound in its history. The country topped 9 percent growth in 1987, and expanded by 12 percent, on average, from 1988 to 1990.

The economy diversified significantly over this period. The share of GDP composed of agricultural activities receded from approximately 32 percent of GDP in 1965, to 23 percent in 1980 and 12 percent in 1991. Meanwhile, manufacturing value added rose from 14 percent in 1965 to 21 and 27 percent, respectively, in 1980 and 1991. The importance of primary commodity exports, which were principally rice, rubber, teak and tin, became less as light manufacturing (including processed food) took center stage. To illustrate, rice, Thailand's leading export commodity for years, was overtaken by textile products in 1985; by 1987, textile exports were double the level of rice shipments. Thailand sought to develop and exploit domestic energy sources in the 1980s, and tourism took off as a major source of foreign exchange. Financial services also expanded as industries required short-term capital to finance imports of raw materials and other working-capital expenses.

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<sup>1</sup>As defined in the design proposal for the CDIE Assessment of AID Agribusiness Projects, an Industrializing Economy exhibits a certain set of agribusiness-related characteristics, including but not limited to (1) increased competition, specialization and economies of scale in agribusiness production, (2) vertically integrated operations, (3) processing advances, (4) openly attractive investment packages encouraging trade, and (5) foreign investment for seed, fertilizer and agro-chemicals. An increasing share of agricultural output in an industrializing economy takes the form of semi-processed foods that become inputs to other industrial processes. Thus the country exhibits a healthy sector producing consumer-oriented, highly processed goods such as grocery items, packaged foods, meats, vegetables and fruits.

At the same time as the country progressed economically, there was significant investment in human capital and skill resources, both of which yielded impressive returns judging from the rising literacy rates and ever-widening pool of skilled labor.

In the 1980s, the Royal Thai Government (RTG) pursued a policy which was pro-business and export-oriented. This policy included cutbacks in public sector spending, stronger tax collection, competitive exchange rate management, vigorous export promotion, and (eventually) a reduction in external borrowing. From 1985 on, the cumulative effect of sound fiscal and monetary management, including a devaluation of the *baht* by 14 percent, positioned the country for growth. Of course, a more favorable international environment, including the depreciation of the dollar against the yen, rising cost pressures elsewhere in Asia, and lower oil prices, was also a factor. These conditions together allowed the economy to transform, which brought rising employment and declining poverty. Thus Thailand offers an excellent example of the benefits to be obtained through outward orientation, receptivity to foreign investment, and a market-friendly philosophy grounded in conservative macroeconomic management and cautious external borrowing policies.

### **Agricultural Sector**

In addition to rice, Thailand produces the following major agricultural commodities (as distinct from finished products): rubber, sugarcane, cotton, sorghum, palm oil, and coffee. Thailand's largest agricultural exports in 1992, according to the FAO, were rice, fresh or processed vegetables (including cassava), sugar and sugarcane, fresh or processed fruits (including pineapple), fresh or frozen poultry, feeds and fodders, unmanufactured tobacco, and fruit and vegetable juices.

Thailand surpassed Brazil for the first time in 1991 for fifth place in the rankings of the world's top consumer-oriented, highly processed food export nations<sup>2</sup>. Thailand is also a fisheries powerhouse, selling over \$3 billion worth of seafood products to foreign countries in 1992. Thailand's agricultural and fisheries exports in 1992 totaled \$12.7 billion, which is roughly 39 percent of Thailand's total merchandise trade. Both indicators have moved in a favorable direction--the absolute value of such exports are up from \$3.7 billion in 1980, and the percentage of total merchandise exports which this represents is down from 57 percent in the earlier period. Thailand continues to have a sizeable trade surplus in agricultural products<sup>3</sup>.

Thai agricultural policy officially supports a philosophy of free trade as symbolized by Thailand's membership in the Cairns Group and the general support of trade liberalization voiced in the Uruguay Round of the GATT. Thailand has also been a key force in the 1990s in formulating the proposed ASEAN free trade area known as AFTA, which is expected to include agricultural products.

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<sup>2</sup>This refers to a categorization scheme used by the US Department of Agriculture/Foreign Agricultural Service. In this scheme, agricultural products moving into the world market are classified into three major product groups: bulk, intermediate and consumer-oriented. The top consumer-oriented food exporter is the United States, followed by the 12-member European Union, Australia, and New Zealand.

<sup>3</sup>Note that although rubber exports are not included in these figures, in 1991, ideal weather helped Thailand to become the world leader in rubber production.

## Origin and Background of the Project

The development of contract farming at LNO was made possible by the construction of a large scale irrigation project at LNO. The LNO Irrigation Project in Sakon Nakhon province, Northeast Thailand, is in the poorest region of Thailand, both presently and historically. The targeted area is served by a complex irrigation delivery system which overlaps three *amphoes* (districts) in this region--Phang Khon, Panna Nikom and Sakon Nakhon. The water delivery system is perhaps slightly above average in irrigated area, measured against other irrigation projects in Thailand. The project can support wet season rice production on 185,000 *rai* (approximately 30,000 ha.), and dry season production ranging from a low of 63,000 *rai* of paddy to a high of 120,000 *rai* of other crops exclusively<sup>4</sup>. The irrigated land supports 14,500 families nowadays, although roughly 15 percent fewer lived there when the project began.

The origins of the project were dual. The Thai political scene in the 1960s and 1970s was characterized by a security-conscious outlook, and Northeast Thailand was an area of prime concern in this respect. The U.S. government at the time was similarly interested in "containing communism," and the Kingdom's increased developmental attention on the Northeast fit this objective. At that time, the LNO area was also identified as one which presented some potential for development as an irrigated agricultural system despite its relatively poor and fragile soils.

Thus the LNO Project was a result of a collaborative effort between a donor country, in this case the United States, and the host country, Thailand.

## PROJECT DESCRIPTION

### Overview of the Project

The development of contract farming at LNO has taken place from 1982/83 until the present, which is a period that actually overlaps with three projects--the Integrated Rural Development (IRD) Project, the Agricultural Technology Transfer (ATT) Project and the Integrated Agro-Production and Marketing (APM) Program, as well as two years of post-project continuation. The final goal of each project was to increase agricultural production, to raise the economic status of the population, and to increase the long-term competitiveness of the irrigated resources management and use in the LNO irrigation perimeter of Thailand. For the sake of simplicity, one may say that the objectives of each project were roughly the same, except for the IRD project's additional objectives and activities related to the physical construction of infrastructure, the formation of Water User Groups (WUGs) and the partial recovery of costs. The purpose was to be achieved through an integrated program of technology transfer, research and demonstration, institutional strengthening, and increased private sector linkages designed to achieve improved agricultural production practices. While contract farming was neither conceived of, nor mentioned, in the initial project papers, over time as government personnel gained from their experience and experiments in market identification and

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<sup>4</sup>Since both paddy and other crops are grown, dry season cropping capacity is currently estimated at 30 percent of capacity.

support, they came to focus more narrowly on the constellation of activities which appeared most promising, which was contract farming.

Construction of the infrastructure began in 1967 and proceeded over an 18-year period, during which the RTG paid the bulk of the costs, and USAID contributed approximately \$4.5 million. Laborers broke ground for the dam, a 30-meter earthen structure across the Nam Oon river at Nong Bua village, in 1967. They started building the irrigation system in 1973, and by 1978 they began consolidating the farmers' lands, constructing the on-farm system of ditches and dykes, and building a drainage system. These tasks were completed in 1985.

### **The Integrated Rural Development Project**

Beginning in 1972, USAID looked for projects that would deal with Basic Human Needs, particularly in the remote, disadvantaged rural areas, which dovetailed nicely with the Ministry of Agriculture and Cooperatives' wishes to rapidly upgrade the productivity of the Northeastern region irrigation systems. This led to the LNO IRD--actually a succession of projects bearing the same title--which was carried out from 1977 to 1985. Its primary goal was to manage the on-farm distribution system and to increase crop production, providing a better income to the populace. The project relied upon numerous Thai officials and foreign technical advisors to develop both the attitude and ability of the farmers to use irrigation water. An abbreviated schematic of the top hierarchy of IRD project's goals and intervention strategies is given below. Secondary goals and activities not shown included community development, road building, and health and family planning sub-components. USAID gave \$4.1 million towards the IRD Project Project.

TABLE 1

### IRD PROJECT GOALS AND INTERVENTION STRATEGIES (an abbreviated version)

<u>Goal/Objectives</u>	<u>Activities</u>
<p><u>Final Goal:</u>            (1) To increase agricultural production. (2) To establish the capacity to pay-back on a cost recovery program. (3) To improve the economic income of farmers. (4) To increase the long-term competitiveness of the irrigated resources management and use.</p>	<p><u>Strategies Relating to Final Goal (1):</u>            (a) Establish a reliable water supply in order to attract a market for dry season production; (b) Develop new technology relevant to irrigated agriculture; (c) Transfer that technology to farmers; (d) Continue to manage the on-farm distribution system, etc.</p> <p><u>Strategies Relating to Final Goal (2):</u>            (a) Develop a policy for recouping construction costs; (b) Establish the Land Consolidation Office to assess and collect fees in line with the policy; etc.</p> <p><u>Strategies Relating to Final Goal (3):</u>            (a) Set up a market system with limited or no risk; (b) Through demonstration and advocacy, convince farmers to participate, etc.</p>

In the early 1980s, once 10 percent of the ditches were completed and WUGS began to function, project officers turned to the goal of agribusiness promotion. Planners tried to set up a market system and identify crops with limited or no risk. Priority was placed on areas and locations, because developing data on yields in the dry season was hard to obtain and to standardize with short staff. Government experimented with crop promotion schemes on traditional low-margin, low-value crops such as groundnuts. In 1981, farmers planted 8,000 *rai* based upon a guaranteed base price of 8 *baht* per kilo of groundnuts. The Bank for Agriculture and Agricultural Cooperatives (BAAC) provided credit for the inputs, and farmers cultivated small areas with extensive (low labor) crops. The next year, when the purchase price was lowered to 7 *baht*, farmers planted only 2,500 *rai*. Ultimately, the government-purchase scheme failed as the "downward push" of such a price policy set off a downward spiral of events<sup>5</sup>.

After the groundnut failure, the emphasis of the project changed somewhat and a new concept began to take hold. This concept had the government taking the initiative to support the private sector, and the private sector taking responsibility for the success of the business. Of course, the concept was not really new, but it began to be paid more than lip-service. This private sector-led strategy specifically incorporated the elements of high-value, labor-intensive, export-oriented production. Consequently, there were initial efforts at market research and marketing extension geared towards the private sector. Foreign and Thai nationals jointly started to invite companies to set up operations in the LNO basin. The Master Plan for 1983-1992 articulated in September of 1983 intended to have a basic package of dry season crops available by the projected date of completion of on-farm ditches in 1985. Anthony Zola, an economist, envisioned 16 possible industrial crops and researched the market for each. In 1982/83, LNO received Louis Berger International's recommendation to begin "pre-production" of baby corn. The following year the crop of tomatoes for processing was added. In 1985, the size of operations for these two crops was enlarged, and information on their feasibility was given to the private sector. By the end of that year, three companies had joined LNO -- Adams Enterprises, Hortthai and East West Seed. There were 171 farmers participating in trials with these firms.

The major innovation pursued during this time to help establish linkages between the private sector and the farmers was the conception and creation of a Specific Assignment Team, or SAT. This activity was never envisioned in the original Project Paper--it was the brainchild of the Project Director, Vichai Snguanpaiboon. He observed that personnel at the project site reported to one of eight national agencies which had direct responsibility for the project. Their primary duties related to the construction of the dam, canals and on-farm system, and the training of technical staff and WUGs. There was insufficient manpower at the project to undertake daily dialogue with each side and to pursue crop identification in the field. Consequently, *Khun* Vichai proposed to hire a group of young, energetic people, both men and women who were recent graduates of a two-year agricultural college, to be specifically assigned to such tasks. More than 100 such people were hired over the next decade. They were called by the acronym 'SATs.'

Beginning in 1981, the SATs helped identify suitable farmers with a propensity to cultivate new crops, steered the private sector to those sites, labored in the trial plots, and assisted in teaching

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<sup>5</sup>The farmer fell into debt with the BAAC, the Ministry of Finance faced a loss, the fund that provided the purchasing money went bankrupt, and the government's image became tarnished as charges of corruption surfaced in the media.

farmers the proper cultivation techniques for the introduced crops. They worked with foreign and Thai nationals to woo companies to LNO, or to turn their interest into a commitment of time and money. By performing background checks and preliminary investigations along with more senior personnel, the SATs built up a store of knowledge and confidence. As cultivation proceeded along a set course in successive seasons (which is described in Chapter Two), the SATs monitored the crops' acceptability by both parties. They served, in the words of one Project Officer, as a "catalyst" for changing the farmers' attitudes and use of technology.

The SATS had other ancillary duties--they surveyed local markets and conveyed information on prices to farmers. The SATs also collected planting and yield information among traditional farmers and those involved in private sector-oriented cropping. As contract farming grew, the Chief SAT and the Project Director together collected target planting data from companies, in order to assist the irrigation operations staff in adjusting water flows accordingly.

### **Impact or Potential Impact on End-Users**

The impact of the IRD project is briefly mentioned here because the development of contract farming at LNO is best seen as a continuum, and it was just getting off the ground by the termination of the project in 1985. Leaving aside the achievements related to the physical construction of waterways, the formation and training of WUGs, and the implementation of cost-recovery procedures, the major impact of the IRD project on the vast majority of end-users was the opportunity to experiment with dry season cultivation for the first time in their lives, and the adoption of dry season cultivation in limited quantities. Data indicating the area under cultivation and the increase of farmers' income at project-end is not available. However, the great majority of farmers who used irrigation water in the dry season planted traditional crops (rice, chili pepper, squash, groundnuts, and so forth). These crops provided some income, but their upside potential was highly constrained.

### **Relative Contribution to the Agribusiness Promotion Goal of IRD**

While the experience of 1983-1985 at the LNO Irrigation Project revealed good progress in terms of learning how to attract the private sector and how to cultivate market-oriented commercial crops, there was much yet to be done. While government officials for the most part lacked even basic experience in commercial crop production in the early 1980's, it was far too soon to label them "veterans" without risk of forfeiting the gains so far attained. Although cooperation between the private sector and farmers had begun to develop, overall momentum was lacking and a further infusion of effort was necessary to propel contract farming to reach a larger beneficiary group, as its scale was trivial. It was nevertheless encouraging that project personnel proved able and willing to facilitate and support managed arrangements during the last three growing seasons.

### **The Agricultural Technology Transfer Project**

When the IRD finished in 1985, the ATT project, which was funded entirely by USAID, started. The ATT Project was actually a bundling of 16 different developmental sub-projects in the Kingdom of Thailand, all of which possessed an agricultural focus. One sub-project was proposed and conducted at LNO. It built upon the agribusiness-related advances made during the prior project, and ultimately served as a bridge to a subsequent project.

The sub-project of ATT located at LNO lasted 3 years, from 1986 to 1988, and had a budget amounting to \$100,698. The total cost of the sub-project was about \$94,000, which was used to employ a project coordinating specialist and a marketing economist for 18 months.

The purpose of the ATT project was stated in terms of institution-building, that is, to increase the capacity of the RTG and private sector to identify and utilize technology. Naturally, this goal became more specific when referring to an individual project. The LNO sub-project possessed roughly similar strategies to what *evolved* in the project that preceded it. It sought to (1) transfer to government officials the knowledge and techniques necessary for the extension of production and marketing of export-oriented industrial crops, led by the private sector. It also aimed at (2) using appropriate linkages and cooperation among investors, farmers and government agencies to structure the production and marketing of high-value crops in a complete-cycle, or contract farming, system that entwined the farmer-private sector relationship.

Project personnel worked to create a three-way dialogue between the parties, as good communication channels are recognized as a prerequisite to risk taking. Crop testing continued to be done on-site, to convince both the farmers and the companies that LNO's environment was suited to particular commodities, and a managed arrangement would be mutually beneficial.

#### **Impact or Potential Impact on End-Users**

The sub-project located at LNO possessed "clear, measurable benefits partially attributable to ATT."<sup>6</sup> The caveat "partially" was explained in this way: "In most instances, it is difficult to attribute the impact wholly to ATT. Seven of the sub-projects studied were built on foundations laid by previous projects [such as the IRD project]. However, the sub-projects accelerated the use and increased the economic impact of new technologies. The sub-project [located at LNO] established the conditions to enable private companies to promote contract farming of specialty vegetable crops worth 50 million *baht* (\$2 million) by 1988/89 and still increasing."

Sub-project activities were judged mutually beneficial to firms and farmers. Farmers learned to use their judgement to assess which crops were in demand by the local market, and the private sector brought its acumen to bear in ascertaining where profit margins would be greatest in the production of specialty vegetable crops. Favorable environmental conditions to produce hybrid vegetable seeds for export and fresh fruit and vegetables for the local market and canning led to greater net income among farmers.

#### **Relative Contribution to the Goal of ATT**

LNO sub-project leaders increased their understanding of how to import and utilize needed technology, in conjunction with the private sector, and in many cases how to transfer the understanding and cultivation skills on to end-users.

Contributing both to increased exports and the increase of farm income, the sub-project fulfilled quite directly the goals of ATT. Farmers adopted technology to produce new crops for which there was

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<sup>6</sup>Final Report, "Agricultural Technology Transfer Project Evaluation", PacMar, Inc., September 1989, page iv.

strong demand. Experience gained during the implementation of the sub-project gave farmers the skills and confidence to deal with private firms.

### **The Integrated Agro-Production and Marketing Program**

The need to identify markets for agricultural output in order to convince farmers to adopt progressive dry season cultivation reached its logical conclusion with a third project, the LNO APM Program. This project was originally proposed by the Royal Irrigation Department (RID) and approved by the Thai Cabinet in July 1986. The project life was five years, from 1987 to 1991.

The APM program staff continued the roles they had originated under the previous two projects, namely identifying the suitable area, crops and farmers that would attract the interest of the private sector, and supporting the firms' activities once they decided to undertake production.

It was originally conceived that four kinds of crops would be grown here. To date, three kinds--seed crops, vegetables for processing, and fresh fruit and vegetables--have succeeded, while one kind--fruit trees--was abandoned.

Bangkok authorities were so impressed with the initiative of the integrated approach, an approach whereby the marketing unit at LNO and the water management unit worked together to induce the cooperation of the private sector and to meet the water delivery requirements of these firms, that the Ministry of Agriculture decided to use the approach of LNO as a model for three replication sites elsewhere in Thailand--Lopburi, Lampang and Songkhla. After a few years, it became apparent that contract farming arrangements did not succeed to any degree in these locales. For a synopsis of the empirical experience of these projects, and lessons learned thereby, see Appendix A.

### **Impact or Potential Impact on Farmers and Firms**

This section presents a sketch of the gains attained by farmers and firms during the APM program. A more comprehensive discussion of outputs and impacts is given in Chapters Four and Five.

The APM Program successfully increased the income of farmers from dry season cropping and helped to diffuse the knowledge of export-oriented crop production. As the private sector enjoyed healthy profits along with outgrowers, it recruited additional farmers so that by 1990/91, participating farmers numbered about 30 percent of the population, and roughly 60 percent of the population labored in either their own or their neighbors' fields (under contract production) at some point during the growing season. The value of all contract farming crops produced in LNO jumped to 96 million *baht* (\$20 million) in 1990/91. The area cultivated under contract farming, there was more than 8,000 rai (approximately 1,300 ha.).

The accelerating popularity of contract farming was due to its mutual profitability. Net income per farmer increased in successive years. In 1991, the high-end and median seed farmers earned roughly \$2,350 and \$1,100 in net profits, respectively. The novice, it goes without saying, earned a lot less than this. The high-end tomato processing farmers earned \$560, while the median and poorest ones gained approximately \$440 and \$170 apiece. Such levels of income were unprecedented in that locale. Most Northeastern Thai households could not save more than 5,000 *baht* (or \$200) on an annual basis, as cited in an article in The Far East Economic Review in 1991.

While the profitability of the arrangements to the private sector can only be guesstimated, contracting was lucrative enough that in 1990/91, five of the seven original companies continued to operate at LNO. Two new entrants brought the total number of firms to nine that year.

### **Relative Contribution to the Goal of APM**

The investment in human resource training for permanent and temporary government staff paid off handsomely. For the government, contract farming proved superior to traditional farming in terms of irrigation efficiency. Additionally, the ratio of the annual expenditure for the APM Program relative to the revenues earned in the area dropped over the course of the program, indicating a more efficient use of public sector resources. The annual fixed unit costs of the private sector fell over time, which points to higher returns on investment. Entrepreneurial activity also arose.

Besides farmers' understanding of the technology and their capability for providing quality assurance, they have also become quite savvy judges of risks and rewards. Their ingenuity and ability to evaluate and respond to varying operational strategies of firms showed that cultivators were reacting more shrewdly than ever before to market cues. They used switching between companies not only to explore other options, but also to learn the constraints of the system. Furthermore, the pervasive adoption of higher aspirations among the populace, including the coalescing of a strong consumer mentality among LNO residents, quite directly fulfilled a longer-term (but unstated) purpose of the U.S.'s bilateral aid program.

### **The Post-Project Period: 1992-Present**

The foundation for agribusiness activities that was established in the prior decade has proved sustainable beyond the life of the projects. The APM Program was disbanded in September, 1991, when the RTG laid off all the SATs. A skeleton of staff from the RID continues to operate and maintain the physical infrastructure. By virtue of their daily contact with farmers and villagers, LNO staff possess a general awareness of the progress of contract farming. Certain key individuals continue to undertake limited survey efforts to discern trends in the type of production or the commercial fortunes of firms that would significantly impact the populace.

Three important conclusions about contract farming were confirmed during the author's field assessment in the autumn of 1993. First, managed arrangements are at this point self-perpetuating, which speaks directly to the question of economic or institutional sustainability. Second, the environmental record of the project is mixed. Third, some farmers have opted out of managed arrangements in favor of cropping strategies that have arisen only recently, strategies that offer even greater rewards along with higher risks.

### **Project Intervention Strategies**

The underlying strategies of these projects are **institution building** and **enterprise development**. Institution building in this context means getting the government to understand the private sector role in development. The strategy of institution building reaches back to the IRD project, and was clearly incorporated into that project beginning around 1982, as indicated by project notes and project interim reports. The strategy of institution building was also the driving force behind the LNO sub-project of the ATT Project. During both of these USAID-funded projects, institution building

was accomplished primarily by having government staff work alongside private sector specialists, in this case both Thai and foreign nationals. This environment was conducive to a free exchange of skills and views. In addition, four senior staff of LNO, persons who managed marketing or water delivery at the project site, toured abroad for one-and-a-half months, in order to observe the situation in advanced countries. The SATs also benefited from on-the-job and classroom training, both of which were vital given the SATs' role and the teamwork required by the project. Institution building continued to be a focus of the APM Program, although expatriate specialists were no longer involved.

Enterprise development in this context was the effort to develop a marketing network and especially to promote commercial outgrower schemes. This strategy arose through monitoring progress and revising activities accordingly. Project papers stated the IRD project aimed to develop new markets for LNO's agricultural production and to develop new technology relevant to irrigated agriculture. However, project officials did *not* have in mind that the private sector would lead in agricultural development, although they possessed an idea that the private sector would play some sort of role. They also did *not* have in mind the cultivation of high-value, labor-intensive crops, which became the cornerstone of contract farming. Instead, the earliest intervention strategy--to set up a market system with limited or no risk, which became the groundnut purchase scheme--was pursued by putting the government in the seat of the private sector. Through trial and error, the LNO staff came to refine the project strategies, internalize them, and better envision corrective measures which could be more effective in reaching the goal. Efforts to establish and promote contract farming were, in retrospect, corrective in how they came about.

In the IRD project notes of 1983, several vehicles for developing a market were mentioned, including contract production and cooperatives development. At that early point, it was not clear that one path would stand out and prove superior to other courses of action. In hindsight, pinpointing alternative courses of action is not necessarily inefficient. It is more important that once contract farming proved superior in remuneration and reliability, it was promoted with zeal and creativity.

Project officials wisely matched the targeted crops with the landholding pattern and the labor profile of LNO. The LNO sub-project of the ATT Project and the APM program focused on high-value, labor-intensive crops, rather than lower value ones, which demand less from the farmer in terms of technical sophistication and discipline, but offer lower potential returns. Since in the LNO area, smallholder farmers are the majority, these two conditions together have meant that different companies were attracted to this area than would operate elsewhere. Many vegetable processing and most seed companies prefer to work with small scale farmers because their output must meet high quality standards, and numerous individual farmers carefully supervising one or two *rai* can provide better assurance of meeting the standards than can large, extensively-oriented cultivation units.

Project personnel were creative in setting policies in order to get contract farming off the ground, and in strengthening the appeal of unfamiliar private sector firms in the eyes of cultivators. To cite three examples, in the beginning, *they delineated zones* which served as the exclusive province of particular firms. In the first year, *they guaranteed to farmers that the companies were reliable and growers would be paid*, or the money would come from the staff member's own pocket. Additionally, *they convinced firms to set up permanent offices* in the LNO area, at least in the dry season, as a

prerequisite for commencing operations there<sup>7</sup>.

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<sup>7</sup>Of course, LNO staff continued to provide market information to all growers regardless of their agricultural commitments or preferences for independent activities, but traditional farmers or independent farmers cropping for sale to passing traders needed less assistance.

## CHAPTER TWO

### MANAGEMENT AND TECHNICAL ASSISTANCE ISSUES

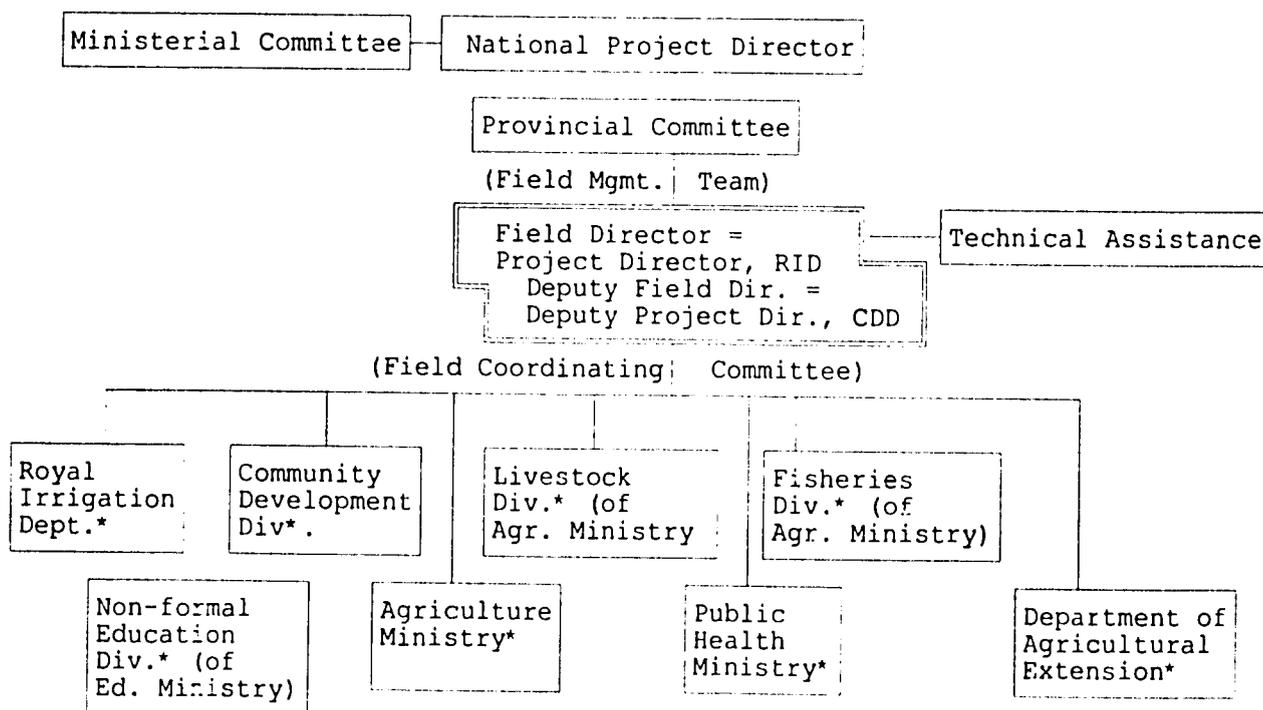
#### MANAGEMENT ISSUES

##### Management and Organizational Structure

The RID was selected as the implementing agency at LNO because they knew how to build, maintain and use the water, and the IRD project was basically a water project. However, the rationale would be the same if it were an agribusiness project. Since control of the water is a crucial element in private sector operations, it is necessary that the people who control the water directly communicate with firms. The water engineers and technicians must view their goal of water delivery as serving the requirements of the private sector.

FIGURE 1

#### IRD Project Organizational Structure



\* Assistant Field Director

Note: the arrangement of eight boxes is NOT intended to indicate any hierarchy

The USAID Project Paper made the initial recommendation to designate the RID as lead agency. The RID has continued to serve as lead agency in all agribusiness-related activities until the present.

The IRD Project had a complex organizational structure, as fits a large rural development project with varying components from dam construction and crop production to road building and family planning. The Project Director was the Field Director of the RID at that location; his deputy was from the Community Development Division (CDD). Eight different agencies of the RTG nominated an on-site Assistant Field Director, each of whom reported to the Deputy Field Director. Each Assistant Field Director was the Team Leader for that administrative unit, and every team leader had their own staff.

Technical assistance reported to the Project Director.

The LNO Project got off to a slow start in the 1970s and early 1980s. A mid-point (1981) USAID evaluation stressed that this project suffered from many of the weaknesses of other Northeastern projects. The most critical problems were economic and physical, with both categories influenced by managerial difficulties. Too many committees--at the ministerial, provincial and field level--stymied decisionmaking and wasted time. Key informants suggest only a field committee was needed--the Project Director could coordinate at the provincial and ministerial levels.

Most managerial problems were between Team Leaders and their respective bosses in Bangkok, and not at the field level<sup>8</sup>.

The integrated approach was most successful on-site, partly because at the field level, all parties knew each other before the project began, and cooperation was the norm. The Project Field Director held monthly meetings with the IRD Field Coordinating Committee, composed of representatives of participating agencies, and maintained good communication with district and provincial officials. The joint efforts of this active committee, which at times required the leaders to cross bureaucratic lines, were instrumental in the success of crop promotion schemes. To cite a specific example of cooperation, the training of WUGs had always been done by the Ministry of Agriculture and Agricultural Cooperatives, but at LNO, management decided that the CDD would train the WUGs.

To the credit of the Field Director and the USAID supervisor, the SATs were another improvised tool of LNO. The first group of seven SATs joined LNO around 1981, and when cultivation of baby corn began in 1982/83, more were added. As mentioned previously, the SATs were not part of the project design; their hiring was never approved in Bangkok. As the former Project Director recalled, "In the early years, regular staff only took care of their regular jobs. The Department of Agricultural Extension was not concerned with marketing and never heard of tomato for processing or baby corn." But *Khun* Vichai, the Project Director, had full authority to supervise the LNO budget without involving Bangkok, and the outlay for SATs was small compared to the cost of construction. Vichai initially hired SATs under the pretense of "construction workers," but instead they were sent to villages to get farmers to agree to give up land for construction of ditches and dykes, and to perform

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<sup>8</sup>Managerial problems included an on-farm irrigation design team located in faraway Bangkok rather than at the site, difficulties in effectively organizing WUGs, and sluggishness on the part of the RTG personnel in taking corrective actions on economic and physical problems already identified.

other WUG-related tasks. Once farmers knew the SATs well, it made sense to involve the SATs in marketing activities. This involvement caught the eye of a supervisory USAID worker, Sarah Schwartz, who obtained financial support for them from USAID/Bangkok.

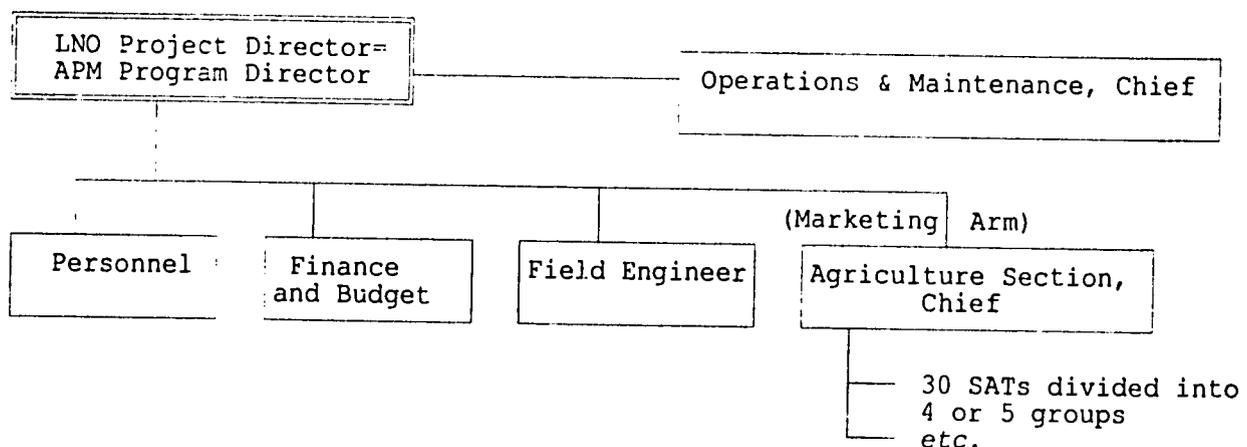
USAID recommended that the Field Director have authority for any decision regarding the project.

For the ATT Project, the LNO sub-project was not fully supported by all agencies. This may have been due the innovative nature of the sub-project; the RID was directly in charge of agricultural management, which some may have considered a proper role for the RID, but others demurred on this point.

The organizational structure of the APM Program shows how the SATS served as a marketing arm (see Figure 2). At any one time, about 30 SATs were divided into 4 or 5 groups, each with a specific mandate. One group would labor in trial plots with new crops, another group would work exclusively with company A, a third group would work exclusively with company B, and so forth. There were no significant problems with this structure.

FIGURE 2

**APM Program Organizational Structure**



**Project Implementation and the Relationship Among Parties**

Over the duration of the three projects, consultants and senior LNO staff directed SATs, who in turn coordinated activities between the private sector and farmers. Implementation occurred in four stages--Trial Production, Pre-Production, Pilot Production and Commercial Production. The objectives of the Trial Production stage were: (1) to gather marketing information; (2) to learn the production techniques for a specific crop; and (3) to obtain a preliminary cost/benefit analysis of that crop. Available literature was reviewed, and promising crops were tested in the farmers' fields. The risk of crop production at that point remained with the LNO Project. In the Pre-Production stage, both the LNO Project and the farmers took responsibility for crop results. The two parties worked together, LNO advancing credit and inputs to farmers, and the farmers supplying labor. Its objectives

were: (1) to find a model for marketing; (2) to determine acceptance by the farmer; (3) to evaluate the possibility of commercial scale crop production; and (4) to release this information to the private sector. In the subsequent phase, Pilot Production, the area cultivated was enlarged to commercial scale. LNO assisted by bringing in private sector companies to provide inputs directly to the farmer. During the growing and harvest season, quality and productivity were carefully monitored to determine acceptability by both parties. When everything appeared promising, Commercial Production was undertaken. By that stage, LNO was no longer directly involved, as the company and the farmer took full responsibility for production.

The private sector participated in determining which crops to produce to meet market demand and transferred the technology to grow these crops. The firms purchased the produce, generally at prices agreed beforehand. The managed arrangements were quite intricate and varied by the type of crop produced<sup>9</sup>. These arrangements were coordinated by the LNO staff (and in earlier times, the marketing specialist or the ATT consultant) so as to gain maximum benefit to both parties. The close cooperation among the three parties convinced the private sector to confidently invest in agro-industrial crop production to achieve the target goal.

### **Effectiveness of Management in Implementing the Project**

Management of the project was extremely effective. By the end of the IRD portion, the staff of LNO had found a new principle regarding the involvement of the private sector. By the end of the ATT portion, they had identified several new crops and market outlets. By the end of the APM portion, the relationships between the private sector and farmers were self-sustaining.

Management's effectiveness was due not only to close working relationships, but also because project personnel gained skills and knowledge which were valuable to the growers and the firms. Government officials were strong in project identification and marketing extension because they came to understand the principles of private sector-led development. Outside specialists possessed a high degree of confidence which allowed them to take the initiative in identifying potential firms and wooing them, and government staff, through experience and training which bolstered their own self-reliance, fulfilled the same role over time. Management was effective in engaging the private sector in dialoguc, but discussions were not simply perfunctory. Each side valued the other's voice, and

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<sup>9</sup>For example, seed crops are managed either through the company, or the BAAC. The seed is free; the chemicals and fertilizer are made available directly. The buying system can be either quota--the farmer has to make sure the production is within the limits of his quota, or non-quota--the number of seedlings is strictly controlled. In the quota system, a firm will either refuse to buy the surplus output, or will purchase it only at a restricted price. In the non-quota system, the company will buy all the farmer's production from a restricted stock. The buying price is generally determined by the complexity of operations. Laboratory testing of seed output is necessary to verify that production meets complex requirements of moisture, impurity, hybridity and germination. Therefore, terms of payment allow for a time lag in receiving lab confirmations.

For processing crops, inputs can also be managed through the company or the BAAC. Transplants are sold to the farmer in the case of tomato and potato processors, tobacco seed is free. The tomato processing crop is bought with or without quota, depending upon the company. The buying prices can be standardized or graded. With tomato, the company usually pays the BAAC, the bank balances the farmer's account by subtracting the value of his loans, and credits him the remainder. Payment is generally made on-the-spot for other processing crops.

Fresh fruits and vegetables are handled similarly to processing crops except there is no quota system. Grading is done by the farmers at harvest time, since this is the crucial factor in fresh market production.

trusted its judgement. For example, the manager of Knoun You, one of the most active firms, asked the Director of the LNO Project to accompany him to Chang Mai in order to evaluate the company training center and suggest improvements. When someone is useful, when advantage can be gained by consulting that authority, one will make use of such a person. Similarly, management was effective in eliciting the trust of farmers. Farmers continued to consult project officers, especially Sansonthi Boonyothayan, when new companies set up shop. The key to communication therefore goes beyond talking; it is understanding each party's interests in the context of site-specific constraints, and having something valuable to say.

LNO officers also recognized the limits of their power and knowledge. For example, when a large firm refused to buy the bulk of the tomato crop which had been grown under contract arrangements, LNO officials brought this to the attention of the provincial governor, who worked out a solution that was amenable to all parties. Likewise, when it became clear that the lack of labor at pollination time was a constraint to increased production, LNO officials stepped aside and allowed the private sector to tackle this constraint. How would civil servants know how to locate workers, how to transport them, what to charge for their lodging and food requirements, and even how to instill their loyalty? As it turns out, companies have been extremely active in addressing this.

There was little effort expended building linkages with other bilateral and multilateral donor agencies because ultimately, the project was fully funded by the RTG, so there was no need to call on outsiders<sup>10</sup>. However, the project was well known within agricultural circles, and LNO received a large number of visitors and foreigners engaged in research, for short or extended stays. Numerous groups from the Asian Institute of Technology viewed LNO's progress. These groups included officials from Nepal, Vietnam, Sri Lanka, Japan and other countries. Project consultants based in Bangkok, veterans of LNO during the 1980s, brought groups of Laotian civil servants to LNO for training in the early 1990s, as part of other projects in their firms' practice. Officials of European development agencies as well as UNDP consultants made study trips to LNO. The Dutch have since embarked on efforts to take the elements which were successful at LNO and to incorporate marketing extension and contract farming into a larger irrigation project at Lam Pao, Northeast Thailand.

## TECHNICAL ASSISTANCE

The objectives for technical assistance were clear, since technical advisors pursued the same objectives as those defined in the project. Louis Berger International served as the primary technical assistance contractor on the IRD project. PacMar Resources performed the same functions for the ATT project.

Technical assistance, which was highly effective, was targeted towards Thai government officials, including senior personnel, water resource managers, and marketing persons (the SATs), and secondarily towards the farmers through actions of the public sector. Technical assistance consisted primarily of pairing experts with government staff, who in turn managed the SATs. In the early

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<sup>10</sup>LNO Project officials knew that USAID did not have an interest in, or funding for, agribusiness projects in Thailand in the mid-1980s, when the Project was looking for money.

1980s, Anthony Zola, a marketing economist drew up a list of potential industrial crops and made initial probes of agribusinesses which proved instrumental. In the mid-1980s, the private sector was just starting to move in, and the marketing assistance of Cherdchai Ongsiriwittaya was essential in getting government personnel to understand how to approach the private sector. Over time, technical assistance became superfluous as government officials themselves developed the capacity to explore, monitor and adjudicate, if necessary, managed arrangements.

Interestingly, training eventually came full circle. By the late 1980s, senior LNO officials themselves conducted several training sessions, ranging from one week to six months, for personnel from other government sites, in order to replicate the LNO experience in other locales.

## CHAPTER THREE

### PRIMARY SOURCES: FOUR INTERVIEWS

#### AN INTERVIEW WITH A CONTRACT FARMER

Nukun Butapeng, a farmer in Ban Fang Daeng, is 42 years. He has two children, a boy and a girl. Since he doesn't himself own land, he farms his mother-in-law's land. (Thailand is a matriarchal society and a husband joining his wife's family is the rule.) When asked what his life was like more than 10 years ago, he replies, "I cannot explain how bad it was. We were poor just like any other family." Before irrigation arrived, there was nothing to do in the dry season. If someone wanted to hire him, he accepted, but it was not a proper job and he did not have a reliable income from it. Once irrigation reached to *Khun* Nukun's plot of land, he grew [the traditional variety of] watermelon in the dry season. He sold this local watermelon to traders who came to his field. He made about 7-8,000 *baht* a year [approximately \$300] from this.

Three years ago, *Khun* Nukun started contract farming with NACO, a private Thai consortium which had received capital from various international donors to start a factory and commence operations in the vicinity of the plant. He worked with NACO for two years, and then he switched to Thai Soon, in order to know the difference between them. In the first year, he planted two *rai* of tomatoes for processing and earned a net profit of 10,000 *baht*. The subsequent year, he earned 18,000 *baht* profit. This past year, *Khun* Nukun increased his planted area by 50 percent and made 35,000 *baht* [\$1,400] after expenses. These earnings do not take into account his or his family's labor, although they do include the expense of hired hands.

When queried if he thinks contract farming is fair and reliable, *Khun* Nukun replies affirmatively. When he judges a firm, if they have the backing of the BAAC, a government bank, he is willing to work with them. If they don't have links to a bank, he is afraid they will go bankrupt and he will demur.

*Khun* Nukun is satisfied with the company's field supervision. In fact, now he thinks that he is better than the company staff. "I have a lot of experience. The company extension worker cannot catch up with me because I am better than he. I am scientific-minded and I can learn on my own, too." He explains how he judges how much fertilizer to use under different conditions, in order to optimize output.

What has he done with his income? He bought a TV and a fan, and also put it towards various everyday expenditures. He intends to purchase a gasoline-powered, hand-driven tractor. He also plans to save to build a house.

*Khun* Nukun is quite pleased with his situation. "I am sure with tomato. I have never lost with this technology." He comments that today is much better than before, he can rest securely [*sabai*, in the vernacular]. He can buy things to eat. When asked to evaluate his position relative to the person

who outmigrates, Khun Nukun replied, "Compared to the man who does construction in Bangkok, my income is not less than that. Their money is not much different than here."

His village seems to have reached the same conclusion. Last year, Ban Fang Daeng had only 8 *rai* under managed arrangements. This year, 140 *rai* will be planted with tomatoes for processing.

### AN INTERVIEW WITH AN ENTREPRENEUR

Somchai Para, or *Khun* Somchai as he is called in the local parlance, is an entrepreneur in the agribusiness sector in Thailand. He worked in other agribusinesses for 20 years, but three years ago he set up his own company called Euro-Asian Seed. It is an entirely Thai company, employing six people, three part-time and three full-time.

*Khun* Somchai has an extensive background in agriculture. He possesses an Agricultural Economics degree from Kasetsart University (in Khon Kaen, also in the Northeast). After academic study, he gained practical training working for Adams International, a Taiwanese-based company that has coincidentally had a presence at LNO for at least half a decade. For eight years, he learned the ins and outs of vegetable seed production. *Khun* Somchai rose to become First Manager for Adams Enterprises. Then he moved on to work for S&P Food Supply Company.

*Khun* Somchai became familiar with the LNO area when S&P Food Supply experimented with the production of potatoes for processing there. S&P sold the output to a processing factory which produced potato chips primarily for domestic use and sale to the Southeast Asian market. Somchai observed that some of the farmers learned some aspects of cultivation, but on the whole, they could not control the quality of potato production. Since the firm was unprofitable, S&P's activities at LNO languished. According to Somchai, "S&P could not make money, but I want to make money and I think potato will succeed working on my own."

So Somchai has been gathering a group of potato farmers for the next season. He has chosen to work at LNO because "I love that area and S&P is only a small company, but I can expand if I can get the market."

*Khun* Somchai exhibited a great deal of flexibility in his first few years on his own. He started by contracting with farmers producing tomatoes for processing, which he sold to Thai Soon, a large Thai enterprise employing outgrowers at LNO and processing tomato paste at its factory along the Mekong River. Actually, Somchai claims to have "invited" Thai Soon to the LNO area, whereupon the next year "they kicked me out." Still, he persisted. Last year *Khun* Somchai supervised the production of fresh sweet pepper by LNO growers. Part of the output was sold in the fresh market of Bangkok, and part went for processing.

Somchai is optimistic about expanding his business. "My expansion depends upon getting the market. If I succeed in getting orders, I can get the farmers because I have a good credit rating in this area, and I do not delay in paying the farmers [like the seed operations do]." Somchai does not see the present competition as a problem. "If a company comes to the LNO area, it is really good for the farmer. And there are no lack of farmers ready to join with me. If you could get me orders for yard long beans, or sweet pepper, or...." *Khun* Somchai's voice continues, indicating with words

and gestures his eagerness for connections to other middlemen. He makes certain to leave the interviewer with his business card and additional details regarding his whereabouts in Bangkok.

### AN INTERVIEW WITH A PRIVATE SECTOR FIRM

The deputy manager of Asgrow, a Thai subsidiary of a multinational U.S. conglomerate, explained the experience of his firm. Asgrow came to LNO in 1986, built an impressive three-story headquarters, and hired a full complement of staff that eventually numbered 15 persons. For six years in a row, Asgrow recruited ever larger numbers of contractors. During this time, they also allowed their growers to expand their planted area within certain limits.

Most all seed-producing companies at LNO during 1991 and 1992 experienced a sharp contraction in the number of outgrowers as well as the seed quota for each, and the deputy manager confirmed that both these trends had been experienced at his firm. On the positive side, however, the quota in 1993 was back up to the level of 1990, after two successive years of cuts. (In 1990, the firm planned production so that each grower-household would earn 25,000 *baht*. In 1991 and 1992, this target dropped to 17,000 *baht* and 13,000 *baht*, respectively. In 1993, it rose again to 25,000 *baht*.) The contraction over this period was attributable to very high levels of hybrid seed inventory in the United States, which eventually reached a low point, thereby facilitating a rebound in production.

The firm tracks the progress of each household by computer and uses the data to classify the households according to their appetite for hard work, and their ability. About 30 percent of the outgrowers are women.

The deputy manager boasted that the growers at LNO are the very best. This was not the first time the author had heard such praise; in previous discussions with Asgrow's on-site manager, a veteran of company-wide training in Florida, LNO's growers were applauded as the most productive cultivators among all the company's sites from India to Red China. However, "last year, we found a few growers achieved low quality for the first time. This was puzzling. These contractors were not new to seed production. We guess that they didn't have enough labor for pollination, so they brought labor from another province, and those hired hands pollinated improperly." In order to correct this problem, the company plans to improve supervision in the coming season.

Interestingly, the deputy manager states that if Asgrow would receive a higher quota from headquarters overseas (in the United States), they would certainly take on more contractors at LNO.

Roughly 70-80 percent of Asgrow's contractors return to the firm in subsequent growing seasons, indicating a high level of satisfaction with managed arrangements. According to the deputy manager, some of the "exiting" farmers instead join with other contract farming enterprises in this locale, and some leave contracting perhaps to grow fresh melons for sale to passing traders, or to work in Bangkok. He adds that, "if they want to work with Asgrow, they know that they will have very little quantity to produce [because we prize quality over quantity]... and the fresh market for watermelon or cantaloupe is more lucrative than contract farming." The informant confidently adds, however, that Asgrow has also "attracted back" growers who joined with other firms in intervening years.

When queried what changes he observes in the agrarian practices of his recruits, this informant

reports that the company's best farmers are still increasing in their productivity and the quality of their output. They have improved so much, in fact, that Asgrow can now use fewer farmers to meet target volumes. For example, he used to distribute a quota of 2-3 rai per household. Now he can allot up to 5 rai per household. So the number of recruits has not bounced back to the level of a few years ago.

The informant notes two major changes in the company's recent operations. Among the technicians whom he employs, some want to leave to do their own business, perhaps to grow seeds themselves, or to enter the agri-chemical line of work. The company also strengthened their program to teach safe spraying practices by bringing an NGO from Bangkok to conduct on-site demonstrations for farmers.

The deputy manager also revealed that in addition to the technical problem of a recent increase in improper pollination practices, which as noted above seemed correctable in his eyes, two additional issues had arisen. Firstly, soil fertility was going down in some locations. To combat this, the company rotates the area of crop production and advises growers to use organic manure. Secondly, pests from other crops have spread. Currently, the deputy manager is actively seeking cooperation from other companies in order to reverse the spread. He has approached the agricultural officer in Sakon Nakhon to act as an intermediary in contacting other firms, now that the APM Program has been disbanded and there is no longer a specialized marketing staff at LNO.

#### A MEETING BETWEEN FARMERS AND A FIRM TO SET NEXT YEAR'S TARGETS

Nong Koewmongkhun (not his real name) gathered about 40 farmers together on the floor of an open-air prayer hall one afternoon in September. He spoke to them about his firm's targets for the upcoming dry season. The firm he represented was a familiar entity, having operated in LNO for seven years. Most all of the listeners were outgrowers for this firm, Knoun You, in years past, but this time *Khun* Nong presented a new strategy, a clear departure for the agribusiness, which had hitherto been known as a seed enterprise. The cultivators, sitting cross-legged and still, listened carefully and then regalled him with questions.

*Khun* Nong first related his experiences in Taiwan, where he went for training and learned about a fairly new seed for the firm--cucumber seed. Farmers in that country, he claimed, didn't apply fertilizer on time, causing stunted plants. While this appeared to produce good fruit, the seed yield was low. He observed that in Thailand, the growth of cucumber plants was similarly unequal. The plants didn't branch properly and flower formation was low because Thai farmers didn't pinch the heads off. *Khun* Nong also addressed other technical problems. "Farmers should plant the male and female plants a few days apart, to avoid the confusion that results when all fields look alike, and cultivators don't know which is which."

Farmers asked why some fruits didn't yield seed. "If the fruit comes out of the stem," he replied, "then there is no seed. If the fruit grows from branches, it will have seeds." He told farmers that each participant would be given one-quarter of a *rai* of cucumber seed.

*Khun* Nong spoke of the company's plans for tomato seed, talking specifically about pit-falls in growers' techniques. He exhorted them not to reuse the plastic sheeting in their efforts to minimize

costs. "To counteract this practice, the company will discount the price of the plastic this year." He offered advice on preventing the spread of water-borne diseases. He also informed growers that they may not cultivate both tomato and cantaloupe seed, in order to better distribute labor over peak periods. He asked them to develop ideas on their own, and not to wait for their neighbor to modernize. He warned them to keep their chickens and buffaloes from eating the seeds.

Farmers were most curious about certain seed varieties. "Will you have number 122? What will it pay?"

Then *Khun* Nong launched his new business: fresh market fruits. "Since seed production last year was overstocked, in order to keep my company's good growers, we are introducing production of fresh watermelon for export to Hong Kong." He indicated the expected yield in tons per *rai*, and the set remuneration--4.5 to 5 *baht* per kilo, depending on quality. When he paused, about ten hands shot up. Farmers inquired how to determine if the fruits were ripe. They asked what would happen if the truck didn't come. Farmers anticipated many different snafus based upon their experience.

Nong finished with a warning to those who are "unfaithful" to the contract. Referring to a small-time businessman who contracted out watermelon production in this locale in past seasons, he said, "*Khun* Tan is already gone. We have connections to the main distributor in Hong Kong. My company can offer a long-term commitment. We buy a lot compared with those who buy a little.... I will cut off the quota to farmers who sell to the black market."

Farmers had the last word. They requested details of the bank's credit package versus the company's terms for purchasing inputs. They also grilled him, "Why is there always an the increase in input prices?" (He replied that the company also pays more and more for the seeds.)

Finally, the farmers were asked to form groups and to select a group head. They had the option of signing on, paper in hand.

## CHAPTER FOUR

### THE PROJECT'S TARGETS AND OUTPUTS

#### TARGETS AND OUTPUTS

##### Quantifiable Outputs

One approach for discussing project targets and outputs would be to mark out the different periods chronologically, and develop a chart of targets and outputs for each. However, this approach is simplified here in favor of one which gives fuller treatment to the outputs derived during the later 1980s. The reader should keep in mind that the targets listed below were not necessarily identical to the targets being pursued in the earliest days, under government-purchase schemes (see Chapter One). Tables 2-4 and the graphs on the following pages highlight the tremendous growth of contracting in this locale. Although certain indicators have fluctuated, the underlying economic benefits to both parties is apparent.

TABLE 2  
PROJECT TARGETS AND OUTPUTS

TARGET	OUTPUT			
	By IRD end in 1985	By ATT end in 1987	By APMP end in 1991	Currently in 1993
Attract the private sector	3 firms	7 firms	9 firms	8 firms
Increase in the number of participating farm hshlds.*	171	680	4,350	4,000
Increase production area, <i>rai</i>	N.A.	709	8,354	6,369
value, million <i>baht</i>	N.A.	5.5	96.0	135.4
Diversify crop production	3 types	14 types	19 types**	10 types**
Increase income to contractors net profit, <i>baht/rai</i> ***	N.A.	4,229	5,332	15,165

\* Approximate number deduced from the number and type of contracts; Does not include hired labor

\*\* All varieties of flower seeds are counted as one type

\*\*\* This number varies depending on the mix of crops grown. 1993's increase reflects the large drop in cultivation of tomatoes for processing, which was offset by increased seed cropping. The latter is more profitable on a per *rai* basis and more labor intensive. These figures do not include the value of the household's labor input.

The last line in the table above--which shows income figures surging threefold (from 4,229 baht/rai to 15,165 baht/rai) is due multiple factors including (1) changes in the cropping pattern, i.e. a higher ratio of seed to processed vegetable cropping results in a higher average profits per unit area, (2) the positive impact of increased productivity, (3) weather, and (4) changes in the types and varieties of seed crops, i.e. bell pepper seed is more labor-intensive, and consequently more profitable than tomato seed.

To avoid confusion when referring to overall income gains at LNO, Tables 3 and 4 illustrate production and income variations for seed, processing and fresh crops.

TABLE 3  
Contract Farming in Lam Nam Oon During Dry Season  
1991/92 and 1992/93

Crop	Area Planted (Rai)		Number of Contracts		Revenue (Million Baht)		Cost of Production (Baht/Rai)		Net Profit (Baht/Rai)	
	1991/92	1992/93	1991/92	1992/93	1991/92	1992/93	1991/92	1992/93	1991/92	1992/93
1 Tomato (Seed)	834	361	1,668	722	18.76	11.91	10,000	10,000	12,494	22,992
2 Cantaloupe (Seed)	704	296	704	296	14.08	7.55	8,500	8,500	11,500	17,007
3 Watermelon (Seed)	2,264	4,032	2,264	4,032	28.30	94.30	6,000	6,500	6,500	16,888
4 Vegetable (Seed)	61	53	122	106	1.22	0.62	5,000	5,000	15,000	6,698
5 Bell Pepper (Seed)	77	93	154	186	1.92	4.65	12,000	12,000	12,935	38,000
6 Flower (Seed)	-	15	-	30	-	0.13	-	4,500	-	4,167
7 Cucumber (Seed)	-	216	-	432	-	8.29	-	5,000	-	33,380
8 Eggplant (Seed)	-	34	-	68	-	0.56	-	3,000	-	13,471
9 Tomato for Proc'g	2,710	1,164	1,350	582	17.07	6.55	3,000	3,000	3,299	2,627
10 Potato for Proc'g	87	105	174	50	0.52	0.85	3,500	3,500	2,477	4,595
Total	6,737	6,369	6,436	6,504	81.37	135.41				
Weighted Average							5,577	6,096	6,575	15,165

TABLE 4

## PRODUCTION AND INCOME OF CONTRACT FARMING, BY END-USE

1986/87 - 1992/93

	Area Planted C. Farming ( Rai ) 1/ A	Number of Contracts 2/ B	Total Cost C. Farming C	Total Revenue C. Farming D	Avg. Cost Per Rai C. Farming C/A	Avg. Revenue Per Rai C. Farming D/A	Avg. Net Income Per Rai (D/A) - (C/A)
<b>Crops for Seed</b>							
1986/87	560.52	665	2,433,505	5,323,681	4,342	9,498	5,156
1987/88	831.39	1,110	3,689,785	11,002,975	4,438	13,234	8,796
1988/89	2,503.65	2,827	11,429,855	35,484,930	4,565	14,173	9,608
1989/90	4,890.31	4,912	20,672,897	74,379,681	4,227	15,210	10,982
1990/91	4,551.07	6,007	36,267,800	76,683,289	7,969	16,850	8,880
1991/92	3,940.00	4,912	29,137,000	64,280,000	7,395	16,315	8,920
1992/93	5,100.00	5,872	34,964,500	128,010,000	6,856	25,100	18,244
<b>Crops for Processing</b>							
1986/87	119.11	81	105,053	216,238	882	1,815	933
1987/88	408.75	200	535,115	831,509	1,309	2,034	725
1988/89	1,786.58	342	2,285,661	3,748,173	1,279	2,098	819
1989/90	2,070.25	1,053	2,376,000	9,843,898	1,148	4,755	3,607
1990/91 3/	3,598.00	1,209	15,531,736	19,467,839	4,317	5,411	1,094
1991/92 3/	2,710.00	1,350	8,130,000	17,070,000	3,000	6,299	3,299
1992/93 3/	1,164.00	582	3,492,000	6,550,000	3,000	5,627	2,627
<b>Fresh Crops 4/</b>							
1986/87	30.00	42	NA	NA	NA	NA	NA
1987/88 5/	89.00	91	238,415	94,941	2,679	1,067	(1,612)
1988/89 5/	147.25	100	301,395	561,460	2,047	3,813	1,766
1989/90	161.25	100	NA	831,309	NA	5,155	NA
1990/91 3/	103.50	95	217,180	(132,603)	2,098	(1,281)	(3,380)
1991/92 3/	87.00	174	304,500	520,000	3,500	5,977	2,477
1992/93 3/	105.00	50	367,500	850,000	3,500	8,095	4,595
<b>Total</b>							
1986/87	769.63	788	2,538,558	5,539,919	3,577	7,807	4,229
1987/88	1,329.14	1,401	4,463,315	11,929,425	3,358	8,975	5,617
1988/89	4,437.48	3,269	14,016,911	39,794,563	3,159	8,968	5,809
1989/90	7,121.81	6,065	23,048,897	85,054,888	3,236	11,943	8,706
1990/91 3/	8,252.57	7,311	52,016,716	96,018,525	6,303	11,635	5,332
1991/92 3/	6,737.00	6,436	37,571,500	81,870,000	5,577	12,152	6,575
1992/93 3/	6,369.00	6,504	38,824,000	135,410,000	6,096	21,261	15,165

1/ Operation for dry season only, November - April

2/ One contract is for one farmer planting a single crop, i.e. one farmer can do multiple contracts by planting different crops

3/ Estimate for the last three years based on sampling of 10 percent of participants

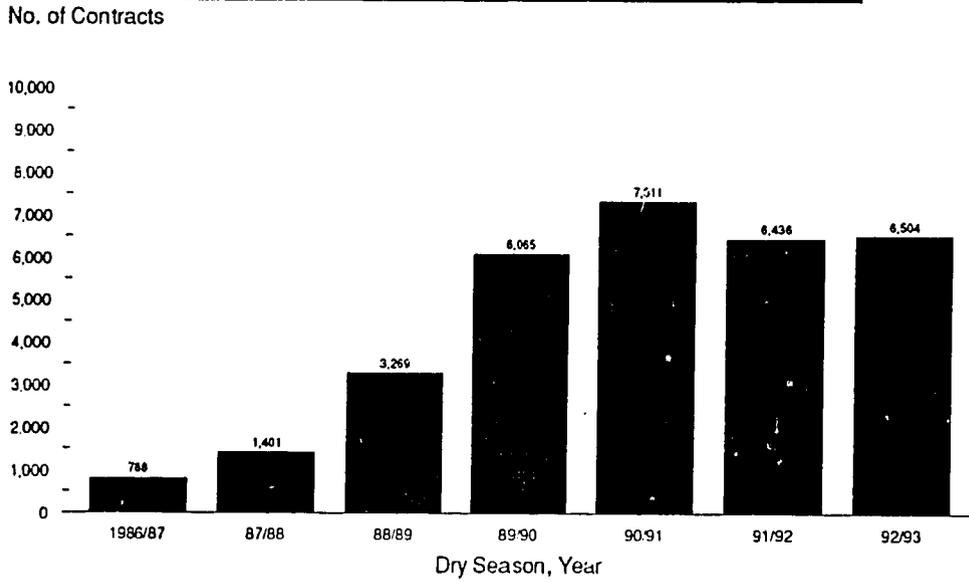
4/ Fresh crop data is not perfect

5/ Some crops already harvested, and some crops not yet harvested when revenues were ascertained

BEST AVAILABLE DOCUMENT

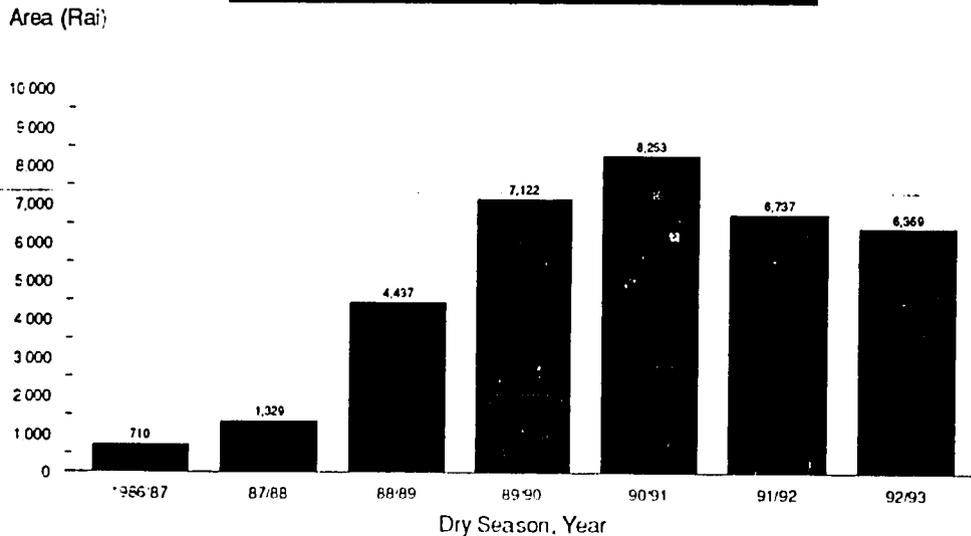
GRAPH 1

**Number of Contracts Rises, Then Flattens**



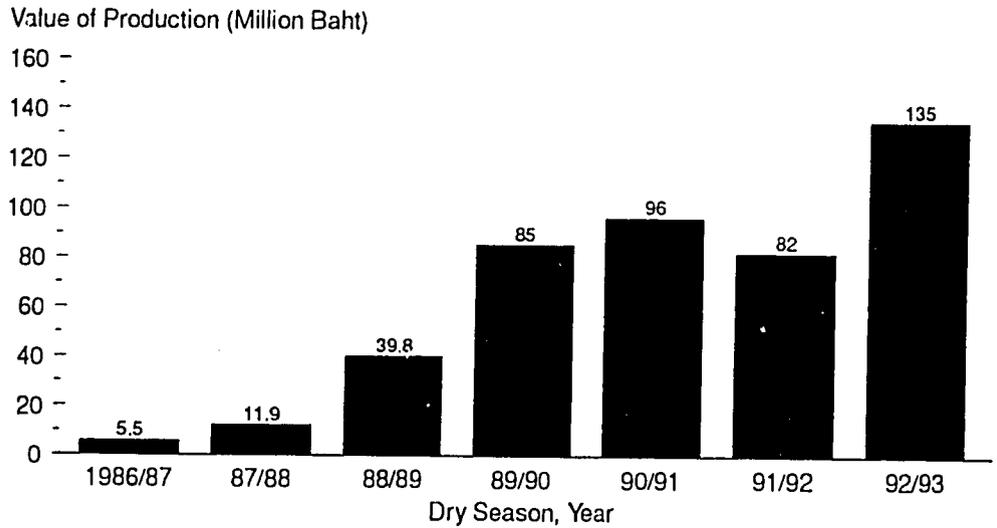
GRAPH 2

**Area Planted Rises, Then Drops Off  
As The Mix of Crops Changes**



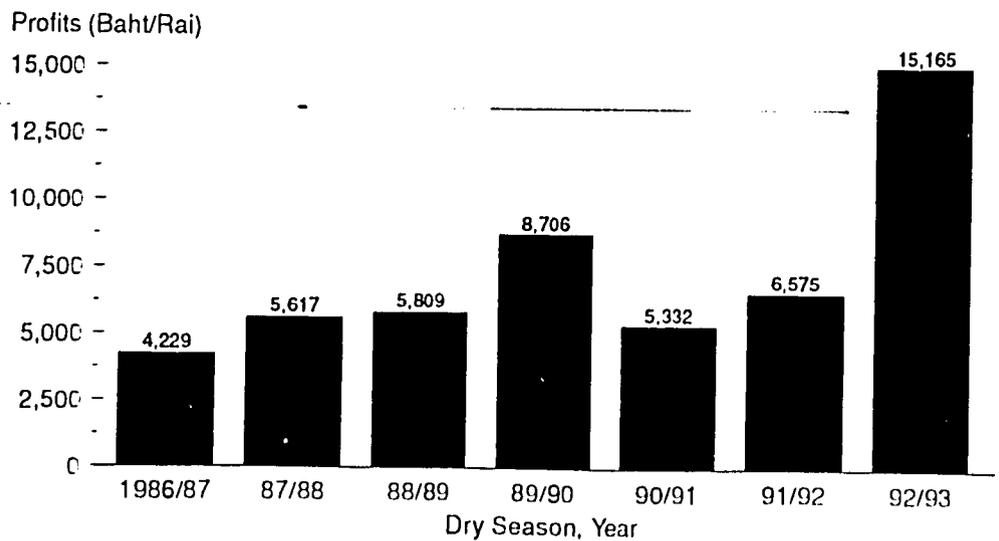
GRAPH 3

**Value of Production Rises  
As Seed Crops Push Up Revenues**



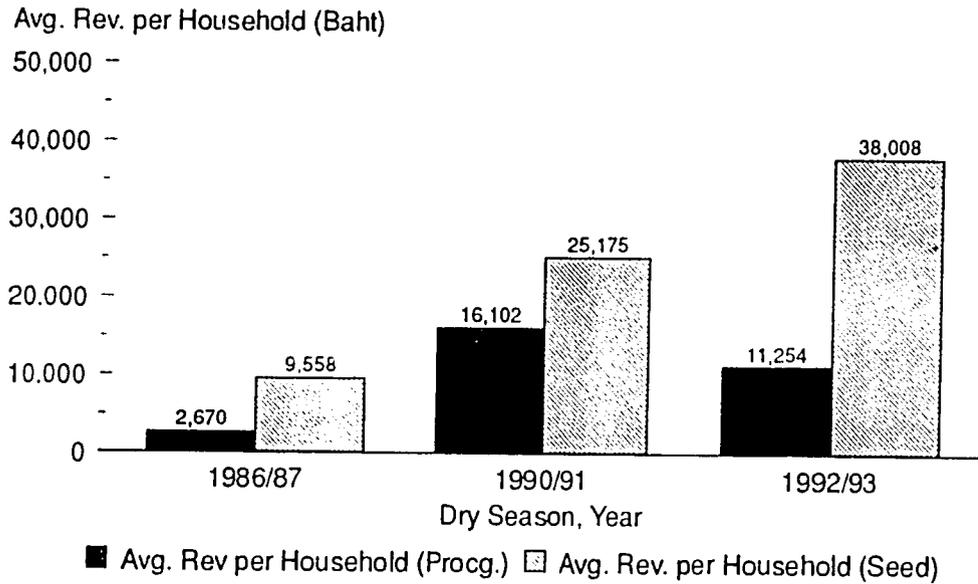
GRAPH 4

**Average Net Income Per Unit Area Rises  
As Seed Cropping Expands Sharply**



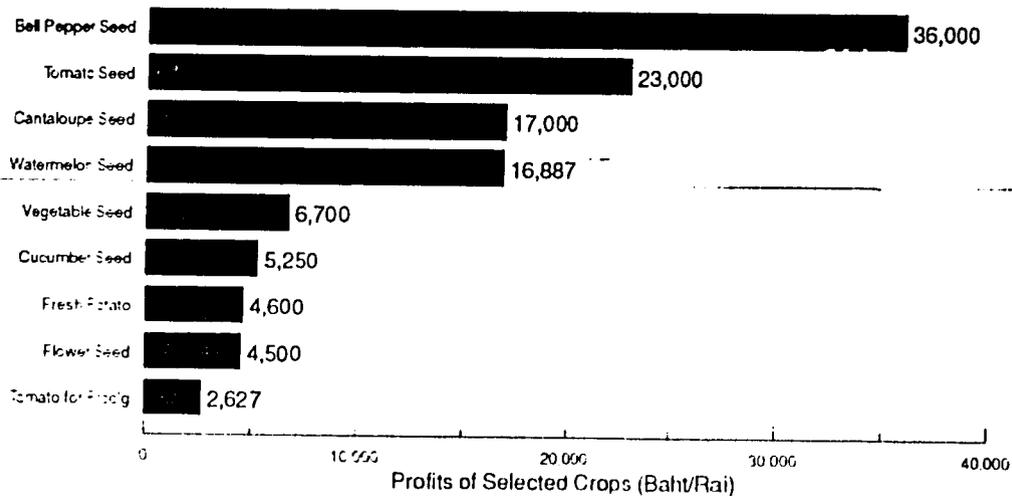
GRAPH 5

**Average Revenue per Household Rises,  
But Must Be Considered Separately for Seed, Processing Crops**



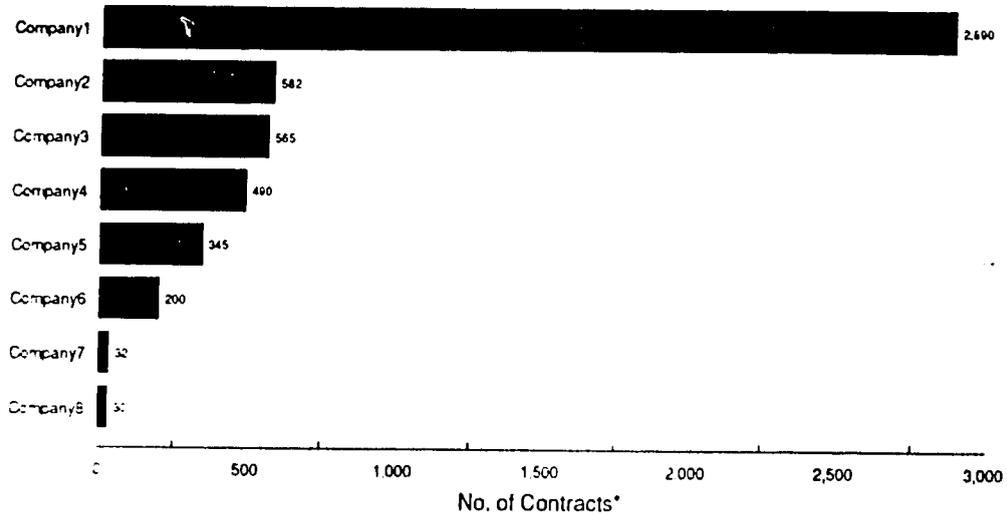
GRAPH 6

**Profits Vary By Crop, As Labor Input Varies Too  
Dry Season 1992/93**



GRAPH 7

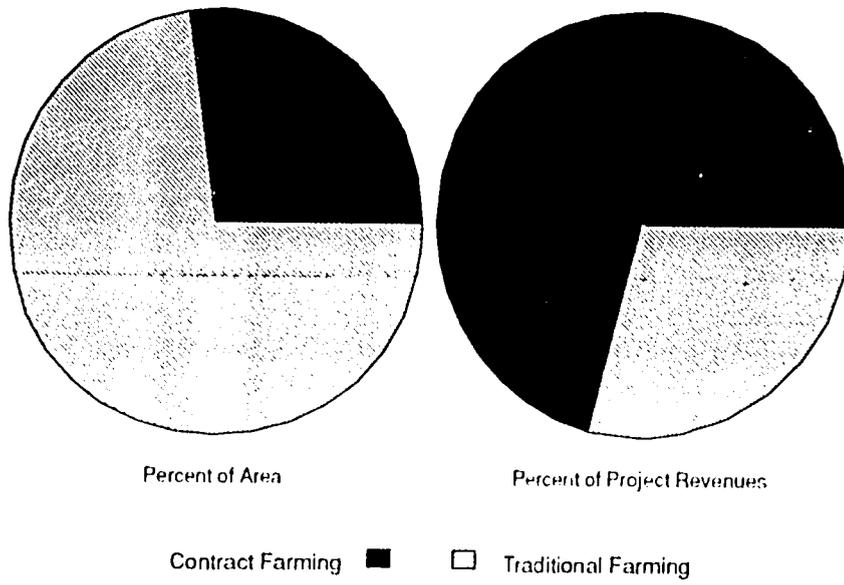
**...And Firms Vie To Sign On Farmers**



\*No. of contracts is a proxy for number of farmers

GRAPH 8

**Superior Land Use Efficiency**  
Dry Season, 1991



In a developing country like Thailand, expanding agricultural activity brings an increase in inhabitants' work responsibilities, and this has been even more pronounced at LNO due to the labor-intensity of the cropping pattern. For example, the aggregate number of days of work created as a result of managed production schemes approached 600,000 man-days in 1991, a year of particularly active cropping. (The level of labor demanded varies from year-to-year, as expected.)

As an aside, there are farmers at LNO pursuing traditional cropping during the dry season. While this directly results from the IRD project, it will not be discussed here in any detail. Suffice it to note that roughly 20,000 *rai* are cultivated each dry season with traditional crops, which are far less lucrative, but yet appeal to some farmers, particularly those short on household labor, ill, possessing a wait-and-see attitude, and so forth.

As shown in the preceding graphs and tables, the quantifiable benefits for the contract farmer are summarized as follows:

- Assured market and an increase in choice of market;
- Increased income, and to a somewhat lesser extent, a more stabilized income;
- Employment of surplus labor; and
- More efficient land resource use.

#### **Qualitative Description of Outputs for Government, Farmers, and Firms**

In a project that seeks to stimulate an understanding of the private sector among government officials, and to push farmers into commercialized agriculture, the benefits to be obtained are not always quantifiable. Perhaps the most important immediate outcome of the project at LNO was the

- Increase in the institutional capacity of Government to promote agribusinesses.

As a direct result of the project, LNO officers exhibited an improved ability to carry out on-farm research and dissemination of new technology, to identify firms and approach them with confidence, and to collaborate with companies and growers and thereby avoid the pit-falls of poor coordination and an absence of community participation. They became more savvy about the impact of price incentives upon farmers' choices and the benefits to be obtained from open competition. By closely monitoring developments, Government responded more aggressively to cues from firms and farmers, whether these cues stemmed from weaknesses in project design, such as the lack of forethought given to protection from chemicals, or from unanticipated challenges, such as an active black market. Their firsthand experience in contract farming propelled many officers to think differently about the future of agribusiness in their country.

Turning to the farmer, contract farming is generally expected to bring the following non-quantifiable benefits to outgrowers:

- Provide credit for production;
- Obtain managerial and technical advice.

Both of these elements were present in LNO. In terms of credit, the BAAC has always offered some degree of access to credit in rural areas. However, in most cases, the BAAC did extend credit for cultivation of small family plots in the dry season, but for rice production. Thus managed arrangements, which may yet involve the BAAC, have provided needed credit.

In terms of managerial and technical advice, it was sufficient in most cases to prod farmers to the next level of sophistication. As evidence, farmers who participated in managed arrangements generally made great strides in productivity over time<sup>11</sup>. Both villagers and company spokespersons acknowledge that growers at LNO have indeed mastered to a greater degree the skills of in-field management. For example, one seed firm claimed that LNO is their most productive site worldwide, from India to Red China. This particular firm carefully tracked the output of each of their growers, and devised a five-step program to analyze each farmers' weaknesses and strengths, and push them to the next level of performance.

In recent visits to the area, several company managers expressed dissatisfaction that the quality of seed output fell in the last year or two. Since cross-fertilization is the chief fear of the private sector, this development is grave. Companies offered several postulates why farmers are experiencing higher failure rates. The most plausible reason is that the labor shortage during the pollination period forced growers to bring workers from faraway provinces, and those workers didn't know how to pollinate properly<sup>12</sup>. The second concern among seed businesses is the increase in pests, which is due to the proliferation of different crops and the spread of their respective diseases. The only effective response is better coordination between companies, and better crop rotation to avoid soil-borne diseases.

Cultivators of tomato for processing crops also made significant progress learning which physical qualities are desirable for tomatoes, and how to control quality. They described steps taken under the direction and teaching of company technicians and LNO water zonemen and SATs, to combat blossom end-loss, fruits with green shoulders, damage from late blight, and similar technical problems which require correct control of irrigation and drainage, among other steps. However, the range of productivity still varies among cultivators.

Some sacrificed profits in the tomato for processing business were due to administrative and technical difficulties of the private sector. The company which had the most marked problems coordinating between their factory and their line managers has exited, but farmers complained about the spoilage of their output in connection with almost every company in one year or another.

Turning to the other half of the equation, contract farming is generally expected to bring the following advantages to firms:

- Quality control;
- Constant supply of raw material.
- Reduced production cost through coordination between production and marketing stages.

As discussed above, the majority of companies at LNO enjoyed these benefits, and thus they continued to operate there. Companies emphasized quality over quantity in order to maximize returns,

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<sup>11</sup>No attempt has been made to measure aggregate productivity gains, since (1) it is subject to the vagaries of weather each year, (2) farmers often plant in different locations with varied levels of fertility in successive years, in order to stem the tide of disease infestation, (3) farmers may be given different crops in alternate years. These factors are beyond a grower's control, but they greatly impact yields and complicate efforts to measure productivity.

<sup>12</sup>Other explanations: the weather was more unfavorable recently, or quality has slipped since under present conditions, firms must pick recruits from among "all comers" once the "cream of the crop" have been spoken for.

a lesson which farmers did not entirely grasp at the beginning. Since profitability is both an immediate outcome and a longer-term issue, it will be discussed at greater length in the next chapter, Chapter Five. However, here it is necessary to establish that the private sector has been basically profitable even though the cast of players--the identities of the firms in any given year--has turned over to some extent.

### NEGATIVE OR UNANTICIPATED OUTCOMES

By contrast, contract farming is also associated, in some cases, with negative ramifications. These include the following:

- Decreased food production;
- Increased indebtedness of farmers, primarily through rising levels of chemical inputs;
- Disproportionate benefit to large-scale farmers;
- Where numbers of local merchants already exist, diminished selling options for farmers;
- Diminished flexibility for firms in obtaining raw material;
- Circumvention by farmers of a superficially "neutral" contract, by selling to buyers to whom they are not bound, to the detriment of the private sector and at the risk of jeopardizing the contracting system at that locale in the future, i.e. dealing in a black market.

These outcomes can be dismissed in connection with LNO, except for the development of a black market. There is no evidence the uptake in contracting has diminished the local food supply. On the contrary, farmers attest to the fact that there are more foods available to them, and more money to afford a more varied palette<sup>13</sup>.

Farmers have indeed taken on greater debt to the private sector or the BAAC at the beginning of the planting cycle, but if farmers follow the advice of field supervisors, it is rare they end the season owing money. The cost of chemical inputs has risen, and the level of outgrowers' expenditures has jumped in parallel, but these trends have not unduly upset the balance of the equation for either party<sup>14</sup>.

There is no evidence that contracting at LNO has been biased towards large farmers. While there are disparities in the landholdings among LNO residents, on the whole, none are really "large farmers." Similarly, there are very few landless ones. However, since firms restrict the area of production for each household--the smallest planted area per household may be one-quarter of a *rai*,

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<sup>13</sup>One interviewee said that in former times, he had to catch fish from the paddy fields, but these days he can purchase meat from the market. "Now, if my neighbor has a chicken, well, I can buy that too." Another related how alcoholic beverages at weddings used to be made from home brew, but with the increase in incomes among the populace, everybody now expects "red whisky", or spirits purchased at a store. Indeed, the market in Phang Khon is stocked not only with locally-grown foods, but numerous non-essential items like snacks, condiments, processed fruits and vegetables, instant coffee, soup mixes, chocolates and imported cookies, yogurt and high-value dairy products, and so forth.

<sup>14</sup>In the case where seed farmers fail any of the hybridity or germination tests, companies often forgive growers the value of the inputs because the enterprises in LNO wish to retain their recruits in subsequent seasons. (As an aside, farmers have verbally praised this policy and cited it as evidence that the companies are fair.) More commonly, novice farmers who produce low yields do not end in debt but earn meager profits compared with the value of their labor.

the largest not more than six *rai*--practically no one is excluded from participating based on their landholdings. In fact, most everyone in managed schemes continues to leave the majority of their property fallow in the dry season. Landless persons who wish to participate have joined as outgrowers by renting land from their neighbors. Furthermore, contract farming has actually increased opportunities for relatively marginalized groups of society--including women and teenagers--to earn wages during the pollination period. Although there is no relationship between landholding size and candidacy for wage labor, practically no job-seekers would be turned away, including small or landless farmers. Labor market impacts are discussed in greater detail in Chapter Five.

The fourth and fifth points--the diminished selling options for farmers and the diminished flexibility of firms in obtaining raw material--don't apply here.

### **Opportunistic Behavior and the Black Market**

In certain years, companies suffered a loss of profits as a black market developed for some types of crops. A few enterprises gave up on managed arrangements for fresh carrots and fresh asparagus due to farmers' opportunistic behavior. Similarly, several years back when the purchase price of tomatoes offered by passing trucks was higher than the agreed-upon price in the contract, some cultivators offloaded tomatoes under cover of night. This phenomenon was not widespread enough to force companies to cancel their entire operations the next year, and in any case, the world price of tomatoes subsequently fell sharply, thereby curtailing the opportunities for farmers of "quick profits" via illicit sales. However, rival market outlets was cited in a number of interviews with firms as a threat to business in this locale<sup>15</sup>.

It is the author's overall impression that most LNO contract farmers appreciate that companies will not return if farmers choose to sacrifice the relationship for short-term gain. One company that proposes to produce fresh melons for export in the coming season warned outgrowers not to break the contract. Since this firm has been a fixture in the LNO landscape and its farmers have been veterans for several seasons, the company is wagering that most growers will see the wisdom in following this advice, although some compatriots would be expected to act more aggressively. The bottom line is: the black market had a negative effect in isolated instances, but it has not proven a major threat to managed arrangements to date.

### **Hazards of Insecticide Sprays**

There has been increased danger to farmers' health from the widespread use of pesticides. Most of the chemical sprays, which are toxic, were new to LNO farmers. Villagers now recognize that these sprays have residual effects on their health. However, far less forethought was given to the health of the rural population when new crops and companies first arrived. Over the years, both LNO and company field staff have increasingly worked to protect farmers by teaching them safe spraying practices, providing protective gear, and educating them to the hazards of chemical use<sup>16</sup>.

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<sup>15</sup>This issue is moot for seed croppers, as there is no local demand for this product.

<sup>16</sup>The LNO project spent several months in 1987 demonstrating safe spraying practices in 30 villages and encouraging farmers to take proper precautions. Additionally in 1990, the LNO APM Program was responsible for, and covered the costs of, blood sampling of more than 100 villagers to determine if they were indeed being poisoned. The blood test

Education and specialization of the spraying task has improved the overall safety record at LNO. Initially farmers resisted wearing the safety suits<sup>17</sup>. Villagers took greater precautions as they grew more conscious of ill effects to them and their animals, and as sickness became associated with chemical sprays. For example, one seed company successfully impressed upon its farmers to use LD<sub>500</sub> rather than LD<sub>50</sub>, which is less expensive but also more dangerous. Nowadays, in the case of cropping vegetables for processing, one man in a village usually performs (for a fee) chemical spraying for all of his or her neighbor's plots. This person wears protective boots, gloves, masks, and so forth. (In the case of seed cropping, this solution is not feasible.)

Companies have looked squarely at this issue and have become progressively more active in the safety debate; this was partly in response to more vociferous complaints of cultivators. Firms began giving away protective gear instead of selling it in an effort to differentiate themselves from their competitors and to win (or maintain) recruits. One manager cited a unfortunate case where villagers reacted as instructed when a farmer drank toxic fluids in a suicide attempt, as evidence that villagers understood the risks of insecticides and learned proper antidotes. One of the more promising developments: in a recent season, a larger seed firm engaged the services of an NGO based in Bangkok to come to LNO and work with the farmers to lessen their risks and improve their protective skills. This NGO does not charge a fee; its expense is covered by outside funding.

Notwithstanding this progress, many farmers complained in interviews that they were afraid of the chemicals, and they were looking to the LNO Project to "devise the next crop, the one that doesn't require spraying." Indeed, fear for their health is one of the most common reasons that growers refrain from participating in managed arrangements.

### Other Environmental Consequences

While environmental objectives were not clearly incorporated into project activities in the early days, in hindsight, they probably should have been. Beyond the immediate impact upon farmer's health, many sprays do not degrade in the soil, and they may otherwise upset the environmental balance<sup>18</sup>. A research station which teaches organic composting practices reported a significant uptake in interest among LNO farmers for advice on how to improve soil fertility through natural methods. LNO staff also spoke of rising levels of salinity in certain irrigated patches of land.

### Unanticipated Outcomes

Contracting in the *wet* season developed as a direct result of the project. Three years ago, a limited number of villagers within the irrigation command area planted improved varieties of watermelon during the wet season, under contract to small-time traders. This activity expanded so that in the most recent visit, at least in one village, almost every farmer grew F<sub>1</sub> hybrid watermelon for the fresh market during the wet season, and those with one or two *rai* to spare cultivated it yearround.

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results were inconclusive in the view of medical experts.

<sup>17</sup>Farmers considered it beyond their means to purchase the clothing, and also felt uncomfortable in the safety suits.

<sup>18</sup>On the other hand, one company claimed that LNO farmers have actually increased the fertility of the land in some places because of their heavy application of manure.

Interestingly, farmers in the rainfed area were induced to participate in managed arrangements. These farmers belonged to one of three groups: they were relatives of LNO inhabitants; they were hired in previous seasons as skilled laborers at LNO, thus seeing firsthand the lucrative arrangements; or they had observed the activity of nearby contract farming villages and were enterprising enough to place an electric pump in a close stream, setting the stage to invite a contracting firm to start recruiting there. Relatives and converted laborers rented idle, irrigated land in order to join, while members of the third group cropped their own rainfed land. This development is important because it indicates that the potential pool of beneficiaries for a government-built irrigation project is not necessarily restricted to persons resident within the physical boundaries of the water delivery system.

Hiring SATs on a temporary basis and assigning them to specific companies operating within the irrigated area became, by default, an exercise in training persons at government expense for private sector jobs. That is, more than forty SATs quit their jobs over the course of the project, and joined the ranks of field advisors of firms, particularly after 1986 and 1987. This was partly a search for job security, and partly a function of the burgeoning demand for their skills and knowledge. Thus the government expense of outfitting a new project implementation unit such as the APM Program can be seen as an investment, lowering the cost to the private sector of skills training.

## ASSESSMENT OF THE EVIDENCE WITH REGARD TO TARGET-SETTING

### Clarity of the Target Specification

The answer to the question "Were the targets clearly spelled out in the project paper?" is not cut-and-dried. While Table 2 picks out quantitative targets of a project based upon promotion of contract farming, there were no results-oriented benchmarks<sup>19</sup> given to distinguish between adequate and inadequate progress towards targets. It appears, in hindsight, that either the benchmarks were all action-oriented, that is, defining specific steps that the government or technical advisors would take, or that quantifiable targets were implied but not spelled out.

Yet action-oriented targets should not be prematurely dismissed. Consider the following comments on the value of LNO help:

<p>At first, the farmers didn't believe the reputation of our company, and were too skeptical to join. the assistance of LNO them on...in one village alone,</p>	<p>In the first meeting, it was very difficult to recruit them, but with officials, who helped to explain about the company, we signed we got 28 farmers.</p>
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---The manager of Asgrow Seed Company

### Timeliness of Accomplishments

Although Thailand's macroeconomic management over the 1980s was conducive to export-oriented crop production, and the financial resources committed to agricultural development at LNO were fairly significant in the earlier years of the 1980s, it is clear that project goals regarding income and

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<sup>19</sup>Results-oriented benchmarks imply a definition of the outcome that will result from the proposed measures.

the participation of agribusinesses were too ambitious for the time frame allotted. Thus the earliest (IRD) project required a two-year follow-on (ATT) project, which in turn required another five-year set of (APM) activities to get beyond a trivial pool of beneficiaries. Given that contracting farming began around 1982/83 at LNO, it took about eight years for a progression of understanding of contracting within government. Although farmers individually learned the technology in three years or so, it took twice that long to grasp the complications and the implications of different planting strategies and the lessons of working with different companies. Even the private sector required several successive seasons in order to be convinced of the potential of the area.

The goals were also slow to be achieved because financial resources had to be specifically committed, or earmarked, in order to develop a project on the scale of LNO. As far back as 1983, SATs labored in trial plots and worked to develop a dialogue with companies and farmers because financial resources had been diverted towards this goal. However, funding for a large task force was not reliably in place until the beginning of the APM Program in 1987.

## **CHAPTER FIVE**

### **ECONOMIC AND SOCIAL IMPACTS OF THE PROJECT**

#### **FIRM LEVEL IMPACTS**

##### **Type of Firms That Operate at LNO**

With few exceptions, the companies which operate at LNO are not typical, large agribusiness firms. They are niche players, sometimes entities of direct foreign investment, with an eye on overseas customers. In the seed business, only the U.S.-based multinational subsidiary (Asgrow of Upjohn), has direct connections to the retail seed purchaser abroad. The others are subcontractors to this firm and to other middlemen. Several of the firms are either subsidiaries of, or have other ties to, Taiwanese firms. There are currently two smaller firms (Thai Golden Seed, Euro-Asian Seed Co.) with a handful of workers, which were formed by breakaway former employees of established enterprises. The companies produce vegetable and flower seeds, tomatoes for canning, and small amounts of other crops. Table 5 profiles eight companies operating in LNO.

TABLE 5  
Description of Companies Operating in Lam Nam Oon, 1991 1/

Company	Type of Production	Size of Thai Operation	Headquarters	Years in Thailand	End User of IFO Output	Season of Operation	Other Thai Locations	IFO Portion of All Operations
Asgrow	Seed	45 tons on an annual basis	Uppjohn	7	95% in USA; some worldwide	Dry	3 years in Lampang, Nong Wai	70% of all seed, including subcontractor purchases
Known You	Seed	?	Taiwan	7 years	USA and Taiwan	Dry, Wet	Kalasin, Nong Khai, Chang Mai	IFO is largest site
Horthai	Seed	10 tons on an annual basis	Thailand	5 years	USA, Europe and Japan	Dry	Kalasin, Nakhon Panom, Sakon Nakhon, Kusanan	80% of all production
Adams Enterprises	Seed and Tomato Processing	?	Thailand/Taiwan	Over 10 years	USA	Dry	Udon Thani, Chaiyapum, Kalasin, Ban Pai, Sakon Nakhon	70% of Udon Thani's operation, which is the biggest site in Thailand.
NACO 2/	Tomato Processing	48,000 tons on an annual basis	Thailand	30 years, but only 4 years in tomato processing	USA, Europe and Japan	Dry	Company farm in Nong Khai, other outgrowers along Mekong	Almost insignificant
SunTech Group	Tomato Processing, Other agribusiness	38,000 tons on an annual basis	Thailand	4 years	USA	Dry (Tomato) Other (Wet)	Company farm in Nong Khai, other outgrowers in Sakon Nakhon, Nakhon Panom, Nong Khai	Almost insignificant
Trimeet Kaset	Potato Processing, Fresh and Other	280 million baht/yr. annual business	Thailand	15 years	Thailand (85% of output); SE Asia (15%)	Dry (Potato) Wet (Fresh)	Chang Mai	10% of all production
Adams International	Tobacco	6,500 tons on an annual basis	Thailand	17 years	USA & China PRC	Dry	94% of amphotoes in Northeast Thailand	Almost insignificant

Notes:

1/ Eight of nine companies are shown; one firm which consisted of a single entrepreneur is not listed

2/ This company has left the tomato processing business since 1991, and Thai Soon (a Thai subsidiary of a Taiwanese company) has taken its place.

Both seeds and processed crops--whole, peeled tomatoes; tomato paste; potato chips; tobacco etc.--are almost exclusively exported. Europe, Japan and the United States are the major commodity destinations. Hong Kong and the Middle East were added to the list of destinations since 1991. Cans and cartons in the warehouses of LNO's agribusinesses show origination in Turkey, Germany and Italy. Clearly, these firms have their sights fixed outwards.

### **The Sustainability Question: Firms are Profiting, and Therefore Plan to Stay**

While the reputation of LNO officials and the reliability and control of water from the head office, the understanding and mastery of technology by LNO farmers, and the freedom to make business decisions in this setting has served as an inducement to companies, it is profit which causes them to stay. Firms' aggregate profits are not readily divulged, but most seed companies' profit margins probably range from 19-41 percent. Several companies producing tomatoes for processing have failed despite persistent efforts for several years, but the interesting thing is that the potential of LNO to produce this crop remains, as evidenced by other companies which have come to fill the gap, offering the same crop. Pre-tax profit margins in the tomato processing business are estimated at 10-30 percent.

Efforts to expand production brought about a reduction in the unit cost of the private sector's investment, which is a key indicator of the viability of a business over the longer-term. During the APM Program, project officers deduced that the fixed expense of all firms in 1986/87 was approximately 7.6 million *baht*, including office rent, salary, and transportation, but exclusive of inputs (fertilizer, seed, and so forth). The same measure was roughly 9 million *baht* five years later. When divided by the area cultivated, which admittedly produces only a gross estimate of the value of production, the ratio of the private sector budget per unit area dropped from over 11,000 to roughly 1,500 *baht* per *rai*<sup>20</sup>.

Although this ratio is hard to pinpoint since the end of the project, the per unit cost of fixed expenses probably reached a nadir around 1990/91 and are on the rise again due to a very large investment by one particular firm. Thus the private sector's cost of operations in this area mimics the pattern of "bulky" investment<sup>21</sup>.

The last two years' experience provides a clue to the future of the seed cropping business in this locale, since firms posted significantly lower levels of seed activity, with one exception<sup>22</sup>. Most companies indicate this contraction was temporary. The falloff was primarily a result of high inventories of seed in the United States which reduced demand for additional stocks. Firms adjusted to the dropoff by forceably cutting farmers, in some cases, or by reducing their growers' quotas

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20The relatively high investment of the private sector in earlier years is a source of consternation to some firms presently. Certain enterprises that have worked at LNO for several years complain that they are at a disadvantage. One interviewee explained that their company invested heavily in human resources--their field staff and farmers, but the firm now finds their growers switching to upstart enterprises that enjoy all the advantages of practiced cultivators, and bear none of the costs.

21Knonn You built a conspicuous, new, two-story building with an adjacent warehouse. Project personnel estimate that the investment in plant alone must exceed 5 million *baht*.

22The exception: one firm reported a boom in demand for watermelon seed last year. In response, they tripled the quota offered to farmers.

proportionally<sup>23</sup>. They also laid off a portion of their staff. Currently, they foresee this coming year's production at or above the record year of 1990/91.

There is one concern here from the viewpoint of equity: LNO farmers have become so productive that most seed firms prefer to increase quotas to their veteran outgrowers, rather than take on new ones, since LNO farmers already want to plant more than the companies can offer and veteran growers are more cost-effective than newer ones. But will new growers have other firms to join with in the future?

### **Competition Forces Innovation**

Companies were forced to experiment with different operational strategies in order to compete for farmers, and to devise solutions to persistent problems. For example, farmers complained loudly about the lateness of payment for seed. One company solved the problem by lagging the collection date among farmers, thereby spreading out the period over which output is delivered to the laboratory, and increasing the timeliness of response to farmers. Another firm separated the most experienced and reliable farmers from the others, paying the old hands in advance because the supervisor felt sufficiently confident the growers followed proper pollination techniques.

To cite another example, the private sector addressed the labor shortage during periods of peak labor. The shortage hampered the efforts of farmers to expand. Farmers usually obtained hired help during peak periods by bringing relatives, persons who stayed with their kinsmen, from nearby districts. While growers retained responsibility for ensuring adequate labor, laborers increasingly acted opportunistically during pollination or harvest period, moving between different villagers' fields. Consequently, one firm advised households to offer a bonus to laborers who stayed the entire season, and to similarly reward pollinators who returned a second year. Another firm changed over to "open pollination" seed varieties which are less labor-intensive. A third company investigated how to optimize yields by reducing the number of flowers pollinated per cluster. Yet another idea proposed by agribusinesses was to pay workers by the plant, and not by the time, thereby rewarding efficiency.

Firms' efforts to diversify their product line and to find their niche is also one of the interesting effects from the competition, and to some extent, the recent downsizing in demand. For example, one firm which used to produce hybrid vegetable seed and flower seed currently concentrates its efforts primarily on flower seed. This firm considers their "staying power" in the ornamental flower business is relatively assured because they have their own varieties, while their competitive advantage in the vegetable seed business was threatened by larger companies which could offer a greater selection of crops to farmers.

One final note is necessary: efforts of a firm to diversify has its limits not only because of the dynamic nature of products at the leading edge, but because as an agrarian campaign proceeds, the relative comparative advantage of an area changes vis-a-vis other areas, which causes the mix of products that are economically feasible to change, too. A private firm may eventually hit against the boundaries of its capabilities and strengths given the costs and availability of resources, so while the

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<sup>23</sup>The manager of a seed firm remarked, "I would not cut the farmers because of the security of the company in the future."

vagaries of global demand for agricultural products is beyond the control of project personnel, it points the larger question, "who is looking to identify the next type of crops and technologies if today's array of agribusinesses do in fact relocate in the future?"

### **Growth of New Agribusiness Firms**

The push to develop commercialized agriculture directly stimulated the growth of new agribusiness firms. Two agribusinesses--Thai Golden Seed and S&P Food Supply Co.--were founded by individuals who used to be employees of larger firms operating here. These start-up companies established permanent offices and invested in staff, fixtures and equipment. Presumably they are selling to other middlemen whom the founders had contact with in their former position. Besides the formation of agribusinesses, at least one individual set himself up as an agent, or a one-man operation subcontracting with a larger firm. However, he did not, to any significant degree, provide technical growing advice. Another individual who resigned from a private firm started a wholesale business selling agricultural inputs.

## **IMPACTS ON THE SHAPE OF COMMERCE**

This section considers local forces in the perspective of larger scale restructuring of the economy.

### **Strong Growth Pole Effect**

The profitability of the arrangements has produced a strong growth pole effect. The local economy is thriving. Construction is booming everywhere one looks. Farmers *and* town residents are acquiring tile roofs, ceramic balustrades, wooden cabinets, and many other improvements for their homes, and stores have sprung up to cater to this new demand for luxury items. The commercial life of the nearest town, the town of Pang Khon, is being transformed with numerous new beauty parlors, motorcycle shops, night clubs, jewelry stores, and so forth. Fabric stores which as little as two years ago sold only local silk cloth (*pa mai*), cotton and synthetic blends, now sell factory-made silk textiles. In the summer of 1991, there was only one store that sold film. Now there are two film stores, and one of them offers on-premises processing facilities. Huge new food and consumer product warehouses were built on the main street. For the first time, a four-story mixed commercial and residential "shopping center" has sprung up. This appears to be the first instance of "apartment living" that is offered in the town.

Besides the rising expenditure for home improvement (extending the dwelling place, replacing the roof with sturdier materials, and so forth), the increase in demand for all types of consumer goods was confirmed by farmers. (See Table 6 on next page.) Farmers with more discretionary income in this area aim to purchase televisions, sewing machines, motorcycles, refrigerators, gold jewelry, tractors, samlor<sup>24</sup>, e-taens<sup>25</sup>, and so forth, but not necessarily in that order. In fact, the purchase of a video tape deck was reported for the first time in the author's 1993 visit.

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24A samlor is a three-wheeled vehicle.

25An e-taen is a larger three-wheeled vehicle.

TABLE 6

Discretionary Spending on "Big Ticket" Consumer Goods, 1991  
Lam Nam Oon and Nearby Rainfed Villages 1/

Type of Consumer Good	When Bought	Contract Farmers	Traditional Farmers	Total Farmers	Percent Hseholds W/ Item 2/	Type of Consumer Good	When Bought	Contract Farmers	Traditional Farmers	Total Farmers	Percent Hseholds W/ Item 2
Television	This Year	1	2	3	59.8%	Samlor 5/	This Year	—	1	1	9.3%
	1 Year Ago	5	1	6			1 Year Ago	—	1	1	
	2 Years Ago	13	5	18			2 Years Ago	1	1	2	
	3 Years Ago	8	1	9			3 Years Ago	1	1	2	
	4 Years Ago	3	—	3			4 Years Ago	—	—	0	
	5 Years Ago	4	5	9			5 Years Ago	—	1	1	
	5-10 Yrs. Ago	3	4	7			5-10 Yrs. Ago	—	—	0	
	>10 Yrs. Ago	5	—	5			>10 Yrs. Ago	1	—	1	
Total	42	18	60		Total	3	5	8			
Sewing Machine	This Year	—	—	0	34.9%	E-taen 6/	This Year	—	—	0	2.3%
	1 Year Ago	—	1	1			1 Year Ago	—	—	0	
	2 Years Ago	3	2	5			2 Years Ago	1	—	1	
	3 Years Ago	6	2	8			3 Years Ago	—	1	1	
	4 Years Ago	2	—	2			4 Years Ago	—	—	0	
	5 Years Ago	2	2	4			5 Years Ago	—	—	0	
	5-10 Yrs. Ago	4	2	6			5-10 Yrs. Ago	—	—	0	
	>10 Yrs. Ago	2	2	4			>10 Yrs. Ago	—	—	0	
Total	19	11	30		Total	1	1	2			
Motorcycle 3/	This Year	4	—	4	39.5%	Pickup	This Year	—	—	0	2.3%
	1 Year Ago	5	1	6			1 Year Ago	—	—	0	
	2 Years Ago	6	4	10			2 Years Ago	2	—	2	
	3 Years Ago	1	—	1			3 Years Ago	—	—	0	
	4 Years Ago	1	1	2			4 Years Ago	—	—	0	
	5 Years Ago	—	3	3			5 Years Ago	—	—	0	
	5-10 Yrs. Ago	4	1	5			5-10 Yrs. Ago	—	—	0	
	>10 Yrs. Ago	2	1	3			>10 Yrs. Ago	—	—	0	
Total	23	11	34		Total	2	0	2			
Refrigerator	This Year	—	—	0	15.1%	Iron Buffalo 4/	This Year	—	—	0	30.2%
	1 Year Ago	4	1	5			1 Year Ago	3	—	3	
	2 Years Ago	1	1	2			2 Years Ago	1	3	4	
	3 Years Ago	3	1	4			3 Years Ago	12	2	14	
	4 Years Ago	1	—	1			4 Years Ago	2	—	2	
	5 Years Ago	1	—	1			5 Years Ago	1	—	1	
	5-10 Years Ago	—	—	0			5-10 Yrs. Ago	1	—	1	
	>10 Yrs. Ago	—	—	0			>10 Yrs. Ago	1	—	1	
Total	10	3	13		Total	21	5	26			

Percent of Households Reporting None of the Above = 8.1%

## Notes:

1/ Sample size is 86 farmers; 57 were contract farmers and 29 were traditional farmers

2/ Percentages are calculated based on the 86 households interviewed; respondents reporting multiples of the same item are counted as one household occurrence

3/ Three farmers owned 2, 2 and 3 motorcycles respectively; the most recent purchase is tallied

4/ An iron buffalo is a hand-held, gasoline-powered tractor

5/ A samlor is a three-wheeled vehicle for transporting people and produce

6/ An E-taen is a larger three-wheeled vehicle

**BEST AVAILABLE DOCUMENT**

Farmers are also underwriting the education of their children. Many factors affect a parent's decision to take a child out of school, so it is nearly impossible to quantify the relationship which increased income has to the period of schooling. Furthermore, simultaneous with LNO's growth but unrelated to it, the highest grade level at which school remains free was extended. Still, it is noteworthy that 4 years ago, 1,200 children were in the middle school located in Pang Khon, and this year there were 1,460 students, an increase of 22 percent.

### **The View of Banks: Savings and Loans**

Banks in the district report that savings balances have doubled in the last eight years. The majority of accounts are kept by housewives because, culturally, husbands do not get involved with banking.

Similar to the rise in deposits, the Chief Loan Officer of Bangkok Bank (Pang Khon) reported that for at least half a decade, his bank experienced 20 percent increases per annum in the size of its loan portfolio to farm families. The bank currently has 200 million *baht* (\$8 million) outstanding to about 2,000 families, which is up significantly from roughly 600 families about five years ago. There has been particularly sharp growth in loans for the purchase of gasoline-powered, hand-driven tractors.

Not surprisingly, just as the positive growth of the private sector impacts the farmers which are attached to those firms, when a firm fails in its business, its outgrowers are similarly squeezed, which impacts the loan repayment and default rates experienced by banks. For example, two years ago, farmers attached to one tomato processing firm that went bankrupt had to postpone payment on their loans, and in some cases, pay fines for delinquency, too.

"Based on today's government policy and especially water resources policy in rural development, I think the position of farmers will be better in the next half decade," predicted the Bangkok Bank Officer.

### **Labor Availability**

The labor shortage has already been alluded to in previous sections, but here it will be examined in greater detail.

The impact of managed production on worker availability and wages has far-reaching consequences. As the opportunity to grow lucrative crops in the dry season has spread--when farmers would otherwise leave land idle, let it be used for grazing, or plant only sections of their plots with low profit, traditional commodities--the multiplying number of persons who join in contracts with firms engenders a parallel increase in the demand for hired labor, especially when the introduced crops are labor-intensive. As a result of this competition among cultivators, wage rates have almost doubled since 1986/87. Considering all available information, wages hovered around 25-30 *baht* per head plus extras in 1986/87, and were typically 50 *baht* per head plus extras in the last dry season<sup>26</sup>. In fact, the author heard reports of paying 80 *baht* per head, but this number is likely an extraordinary outlier. Workers have to be brought in from farther villages every year, making labor availability

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<sup>26</sup>Extras refers to wages paid in-kind, such as curry and rice, or full accommodation.

one of the main constraints to a single farmer's expansion and the overall growth of managed production in this locale. The labor shortage is made more acute not only by strong outmigration in the dry season, but also since the pollination period coincides with the harvest of non-photosensitive varieties of rice.

The labor shortage appears to be exacerbated when there are forcible cuts in the ranks of outgrowers among firms, as occurred in the past two years. In this case, a large portion of farmers who were not recruited for managed arrangements left the area.

For the individual farmer requiring hired labor during certain dry season months, and particularly for the seed farmer during pollination time, rising wage rates and the tightening labor pool do indeed pose limits, but for the regional economy as a whole, it is not necessarily negative. The Northeast has long lagged behind other areas of Thailand in terms of wages and per capita income, so it bodes well that the opportunity to supplement household income with off-season work has improved.

### **An Estimate of the Number of Jobs Created**

An important effect of these changes is the creation of more rural jobs. A back-of-the-envelope calculation shows that approximately 400 rural jobs directly result from the project. The breakdown is as follows: about 85 persons are engaged as field extension workers for companies; roughly three times this number are engaged in service industries, including the building sector; and the rest of the jobs are associated with factories for tomato processing or a small expansion of government positions in health care, education, and so forth. Another way to get at this number: if money is injected into the local economy for several years at the rates observed (from 32 million *baht* in 1987 to 135 million *baht* in 1988 and 183 million *baht* in 1993, including both contract and traditional farming), then the multiplier effect will palpably impact the available job opportunities for the population.

## **PEOPLE'S LEVEL IMPACTS**

### **Change Over to a Mentality of Commercialized Agriculture**

Estimates of the financial gains of farmers are detailed in Chapter One, which gives a breakdown of net profits by type of crop sown for a range of productivity, and Chapter Four, which reviews the trend in aggregate net income per rai for different crops. This data is not repeated here, since it is an immediate output of the project.

The change over from a mentality of subsistence agriculture to a mentality of commercialized agriculture, and particularly the production of higher-valued crops for export, is one of the most important long-term consequences of the LNO Project upon the populace. Project personnel adopted a two-step approach to foster the evolution of farmers' thinking. In the beginning, the government adopted a controversial policy of zoning the irrigation command area, in order to introduce the new system of contract farming without complicating the choices of farmers as to which company to join, or which types of crops to grow. The zone system was in place from 1985/86 until 1988/89; the open system was instituted thereafter. The zone system assigned a single firm to a specific unit within

the irrigated area. Although the zone system was a subject of debate in those early days<sup>27</sup>, it is clear that it has been a success. By the fourth year of operation, farmers were more sophisticated, and the private sector had also become sufficiently familiar with working in LNO to change over to the open system. Under the open system, companies have been free to go wherever they like, and the farmers have been free to choose between companies operating in their village.

Presently, farmers are extremely sophisticated--they know how to "vote with their feet," or move between companies to discover the differences of each. Although there is no explicit bargaining going on, the farmers nevertheless recognize that they have some leverage by virtue of the fact that they have other options. A grass-roots organization or similar entity which negotiates with companies on behalf of farmers does not exist at LNO. Nor can an individual farmer maneuver for a higher purchase price or a particular variety of seed. The farmer is "given" the variety and the purchase price, although in many cases, he or she is asked to state a preference. Farmers switch companies in order to act upon a grievance, or more commonly, to explore other options. In 1992 and 1993, however, movement was less common compared with previous periods because the number of participating households more-or-less peaked for two years so alternative managed arrangements were scarce. (Firms are more eager to "keep" their existing growers in lean times than to test new recruits.) The entry of a new firm to a village is the number one impetus for farmers to switch. Invariably, there is a core group in any village whom are always ready to try the "new player on the block."

Farmers have also discovered some additional ways to optimize income without actually quitting a private firm. For instance, some interviewees worked with more than one company in the dry season, thereby circumventing the explicit policies of the private sector. Others undertook contracting in the wet season.

Improved leverage for farmers does not only refer to wages; it also means improved working conditions. Protective gear for pesticide spraying illustrates this point. When one company provided pesticide sprayers free-of-charge, the other firms felt pressure to match this offer, until the first company one-upped them with safety lessons from "outside experts", i.e. an NGO from Bangkok.

Farmers not only understand the technology, but in some cases, they comprehend the business of the private sector almost as well as some company field staff. For example, growers anticipate problems before they happen, and they demand reassurance that the private sector will take preventative action. This was evident when the author observed a pre-season meeting between farmers and a firm, and the farmers were quick to ask about the timely arrival of trucks at harvest, the coordination of grading and weighing operations, and so forth.

The level of sophistication which farmers attained, combined with the relatively new phenomenon of passing traders who aim to buy fresh fruit for shipment overseas, has brought about a new

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<sup>27</sup>Critics emphasize that the zone system is not helpful because it is more akin to a "protected concession" than a bona fide zone. Since only one firm was permitted to operate in a zone, there was little incentive on the part of the company to increase the purchase price to the farmer, even when the farmer's productivity rose. Neither was there pressure to improve a company's operations and service, since farmers within a designated zone had no other enterprise to join with if they were dissatisfied.

development: farmers who go "independent," voluntarily leaving contract farming to pursue even more risky--yet possibly more rewarding--activities. These farmers grow hybrid watermelon varieties which are newly available, they employ the technical skills developed in managed arrangements, and they have graduated to where they no longer require or desire a specified price or an assured market. One informant claimed that over a hundred of his neighbors who used to be loyal outgrowers voluntarily left managed arrangements due to the opportunity for greater rewards from independent cropping of hybrid watermelon. Although the area where an arms' length market has eclipsed contract production remains small--this phenomenon is confined to Ban Mong Dok, for the most part--it is perhaps a clue to the evolution of agricultural arrangements in the future at LNO.

### **Impact on Women**

Contract farming has generally increased the labor quotient of women's work, primarily because women have most of the responsibility for pollination and emasculation, a labor-intensive procedure that continues over several weeks. While families work together in planting, spraying, and so forth, women and teenagers in many cases pollinate for the household<sup>28</sup>. This is because women (and teenagers) are considered to have "better eyes and more nimble hands." The wife usually undertakes pollination in addition to her other responsibilities for growing vegetables for home consumption, hawking wares at the market, and so forth.

The flip side of this equation, however, is that the propensity to hire women for pollination has increased the opportunities for women *who are not otherwise engaged in pollination for their own family farm* to obtain seasonal employment from their neighbors. Becoming a hired hand can yield several weeks worth of wages (30 days is a common duration), so it is likely to increase her stature, if not her power, within the family structure.

Besides pollination attitudes which favor female laborers, contract farming has increased the number of job opportunities for women graduates of agricultural schools. At LNO, there was significant employment of female SATs, and there has always been a large number of female field extension agents in the private sector. Among LNO Project staff, not only were the majority of SATS women, but the Chief SAT was also female. In the private sector, one firm reported that 2 persons out of its staff of 12 are women. Another manager explained, "because most of the pollinators are women, more than 50 percent of our staff are women. Although hiring women is not a company policy, it just works out that way when we seek the most capable staff." Women have also served at the highest levels of management in the private sector, and in at least two cases (Adams Enterprises, Thai Golden Seed), they run the on-site operations. Additionally, women take an active role in deciding to join managed arrangements. One of the largest firms reported that 30 percent of its contracts are made with women.

On balance, it is the view of the author that the net benefits of contract farming are positive for women. As one company manager, a woman who holds a Ph.D., stated, "We are concerned for families, not women, and families have no doubt benefited tremendously."

There is no differential impact on small and landless farmers, as described in Chapter Four.

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<sup>28</sup>Note, however, that this is not universal. Some adult males perform pollination.

## SECTORAL LEVEL IMPACTS

### Gains in Use of Agri-Chemicals and Tractors

The accelerating popularity of contract farming has caused a boom in demand for tractors. A tractor store in Pang Khon which previously was the only one of its kind, now competes with five other stores. Yet demand remains high enough that this informant still reports a brisk growth in business. For example, three years ago, he sold 100 gasoline-powered, hand-held tractors. Last year, he sold 250, and he forecasts selling 400 tractors this year. Although customers put down 60 percent of the sale price at the time of purchase, and despite an average cost of 48,000 *baht*, this informant reported that farmers, "don't care for price, they care for quality. We outcompete other shops on the basis of the quality of our mechanism and our service contract, not on price." Another testimonial to the increase in tractor purchases: in one village alone, Ban Rae, it is reported that over 100 farmers have purchased this machinery.

Managed arrangements have likewise perked up the sale of inputs (pesticides and fertilizers) to cultivators. Agri-chemical shops report profits increasing by roughly 10 percent a year, and the uptake in demand has pushed up the number of dealers from two to over half a dozen. Discussions with agri-chemical dealers revealed that seven years ago, farmers used manure exclusively. Now, everyone applies chemical fertilizers. Even the type of inputs has changed. Before, farmers used very low grade fertilizer, but now they use a higher concentration. When asked why the farmers do this, the shopkeeper replied, "Because of the recommendation of the extension worker of the companies."

The increase in costs of these inputs has also risen. For example, a 500 cc. bottle of a popular pesticide, Fostrin, rose from 70 to 85 *baht*.

### Changes in Farm Manager's Policies

To a certain extent, the shortage of workers is coloring the choices of farm managers vis-a-vis which crops to grow in order to minimize labor requirements. One large landowner switched from pumpkin to less labor-intensive fruit trees. He also bought his own truck to free himself from dependence on hiring trucks, which are now under great demand pressures.

### Land Resources

The rise in the value of cultivated crop production translates directly into a rise in land values. According to a bank loan officer, ten years back, land cost less than 1,000 *baht/rai*. Nowadays, land in the irrigated area is worth more than 20,000 *baht/rai*.

Although very few people are selling all their holdings and leaving the area, households with big land parcels are selling off portions of their land.

## CHAPTER SIX

### FACTORS AFFECTING THE PERFORMANCE OF THE PROJECT

The success of LNO cannot be explained entirely by factors attached to the project, since sound macroeconomic management and subsectoral policies (an absence of taxation on export crops, unfettered control of retail prices, and so forth) were certainly contributing factors. Nevertheless, it is valuable to list those factors which were internal to the project and particularly impacted its effectiveness.

#### PROJECT DESIGN RELATED FACTORS

##### Management Structure

It was crucial that there was sufficient authority at the project site so that decentralized decisionmaking by the Project Director on-site was maximized. For example, the Project Director observed that people were too busy with their line responsibilities to undertake additional tasks necessary for project identification. Therefore, he decided to hire additional personnel, the team that ultimately became the SATs, in order to solve this problem. This option was facilitated by having authority centered at the project site. It would have been far more complicated to obtain clearance for such an action from a faraway ministerial committee. To cite another example, project officers decided on the basis of their experience in that locale, that in order to induce companies to participate, it was necessary in the beginning to offer them exclusive rights to work in a particular zone for a particular dry season. If such a decision had been debated in Bangkok, it might have been vetoed as a political "hot potato," or it could have been held up interminably.

The fact that the lead agency was the RID, which managed the water, also proved highly effective in convincing companies to set up operations at LNO. The provision of water at certain times and in certain quantities is one of the primary considerations of agribusinesses when they investigate potential locations. This was confirmed in numerous interviews with companies, most of whom said that the quality of LNO's water delivery was a key drawing card of this area. Note that this is more than bravado; LNO boasts more water gates than the typical Thai irrigation project, a micro-computer-controlled water delivery system, and multiple pumping stations to direct water onto slightly elevated lands. With the IRD at the helm, it was straightforward to pitch the features of the project to firms, and to follow through with promised cooperation.

To further underscore the importance of water management to the reader, one must recognize that the crux of the integrated approach was joining the water managers with the marketing personnel, and conditioning them to act in synchrony.

Flexibility proved a valuable ally in implementation, but it is not clear that it was necessary in

*project design.* Recall the change of direction in mid-stream from a government-purchase system to an exploration of other marketing channels. The bottom line is that at LNO, project monitoring was crucial. All the projections and alternative scenarios which project designers could muster would not have mattered without thorough (and fearless) monitoring which showed that the tried methods were not working. This allowed careful consideration of other options and the development of basic tenets which were sound. (In this case, Project officials wisely matched the targeted crops with the landholding pattern and the labor profile of LNO, i.e. crops must be suited to smallholder cultivation, and must be high-value, labor-intensive ones, preferably for export. Likewise, they agreed that the private sector must take the lead.) The LNO experience suggests that parts of the project could conceivably be designed and fleshed out as the project unfolds, if the basic approach can be mutually agreed upon, and is suited to site conditions.

The Project Description section in Chapter One reviews how SATs were the workhorse of the project, so it will not be repeated here. As explained, they were not included in project design, but key informants agree that they were a strong factor in LNO's success and also in achieving continuity from one project to the next. If one were to do it again, key informants would recommend starting out initially with a specific assignment task force to support the objectives of the proposed project. That task force must be linked to the Human Resources Development and Training program. A task force which is dedicated to the mission of the project (and none other) will be better equipped to collect data in order to monitor progress, and to research and demonstrate promising cultivation skills or crops in order to reinforce the lure of dry season cultivation (or whatever the goal may be). They will also be able to undertake time-consuming project tasks, including working on-site with farmers and firms, visiting local markets to gather price information, and so forth.

While the lack of a unit to monitor changes that signal the exit of firms in the post-project period has not *yet* had a deleterious impact upon the course of contract farming, it would likely impact sustainability over the longer-term. No one knows the time horizon during which it is economically feasible to grow these crops, but one cannot always rely on current firms to move into lines of business which stretch the firms' strengths. (For example, a firm performing vegetable canning may not be able to easily transform itself into a dried fruit marketer, or to stretch the point farther, into a snack food manufacturer.) While the rapid rate at which socio-economic changes took place was not anticipated, in hindsight, it would have been sound to have planned for such a unit.

### **Site Selection**

The following criteria for site selection is based on the experience at LNO, the three replication sites, and another project for contract farming of cotton in central Thailand. It is purposefully brief, as most of these points are self-explanatory.

- Soil and water conditions must meet minimum standards. Water must be available in the same location in successive years. There cannot be problems with the inflow of brackish water.
- WUGs, in conjunction with government, must already be able to manage water delivery.
- The landholding pattern must be small.
- The farmers cannot be too wealthy nor too poor.
- There must be a surplus of labor, and the possibilities of year-round employment nearby, for instance, at factories, must be limited.

## Human Resource Development and Training (HRDT)

The objective of training is to get the government to understand the private sector role in agribusiness development, and particularly,

- how the government can more effectively foster the private sector's willingness to invest;
- to communicate firsthand knowledge of the area, the crops and those farmers with strong potential;
- to convince farmers of the trustworthiness of firms;
- to monitor the progress of farmer-private sector relationships so as to anticipate problems, deal with stumbling blocks as they arise, and otherwise facilitate the relationship.

One of the most important factors in project performance was the LNO staff's comprehension of these principles, and the extraordinary efforts which they put forth in order to accomplish their mission. Recall that this understanding came through training and through the best teacher of all, personal experience. By contrast, the failure of the three replication sites of LNO (see Appendix A) drives home the point that government officials who remain weak in their understanding will be hampered in their ability to gain the trust of farmers and firms, and by extension, their capacity to act as facilitator and mediator<sup>29</sup>. Very simply put, they will have little to offer beyond promises. Project personnel must see themselves as one part public relations, one part investment adviser, one part consultant to farmers, and one part local mediator and arbitrator. They must be genuinely excited to play such roles, and they must be able to envision the end-result.

At LNO, training of senior LNO staff (the Project Director, the Deputy Project Director) and the Assistant Field Directors was accomplished by working in tandem with private sector specialists, or outside consultants. This greatly increased the project's chance for success. Specialists from outside the project, persons hired under technical assistance contracts by USAID, first sought to identify marketable crops oriented towards export, which constituted an abrupt change in project emphasis. The investigation of higher-value crops proceeded with the support of the integrated on-site team, and in consultation with them. It was a team effort spearheaded by someone with a clear idea of outreach and the strong pull of free markets, but it was not a solitary effort.

### Duration

The initial project duration was too short. Recall that LNO's performance was still unsatisfactory a full four years after water reached farmer's fields in the dry season. If agribusiness promotional activities had ceased in 1985, one might speculate that there might be nothing to study at LNO today. Instead, as a result of the unfailing dedication of certain individuals, the hard work of the staff, and fortuitous circumstances in obtaining additional funding, this long-gestating project was able to "percolate" even longer, and finally arrive to the point where contract farming took off. It was the longer-term commitment of the host government, as evidenced by its continuation of funding after the completion of the IRD Project, which provided the opportunity for LNO to achieve success.

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<sup>29</sup>Although a task force from each replication site borrowed LNO's objectives as a template and trained side-by-side with the SATs at LNO for six months, this training did not yield significant progress on the scale of LNO at any of the remote sites. While many factors help to explain this, one major liability was poor comprehension of the government's role, sometimes on the part of the SATs and sometimes on the part of their supervisors who didn't receive training.

## PROJECT IMPLEMENTATION RELATED FACTORS

### Project Identification

Crop testing was market-oriented testing, and not crop- or commodity-oriented testing. This was a paramount factor in LNO's performance because ultimately, the private sector had to take responsibility for the success of the business. Enterprises would not have wasted time and money producing crops which were not competitive on the world market, or which suffered from sliver-thin margins or collapsing windows of opportunity. Firms saw that farmers as a group possessed the potential to acquire new technology because some individual farmers had already done so. Company managers demanded proof that the proposed crop had already met acceptable levels of quality in past growing seasons at that particular site, with its particular environmental and weather conditions. Companies had to see they could count on farmers exerting themselves 3 to 5 times harder than in traditional cropping, because labor-intensive crops require this. Consequently, the crop testing initiated by the project asked the same set of questions which an enterprise seeks to answer when scouting out production sites, and it provided tangible, quantitative answers that were used to persuade firms to invest to reap financial returns.

To accomplish a transfer of technology from the 'rice mentality' to a commercialized focus required a financial incentive for farmer participation at the beginning, and a demonstration effect thereafter. The project had to buy the farmers' output in years 1 and 2, even if it was not of saleable quality. Once farmers saw for themselves the potential rewards of cultivating a particular crop, perhaps by observing a neighbor or visiting a trial plot, they voluntarily participated according to their individual appetite for adopting new crops.

### Water Delivery

Two points regarding water delivery were crucial. First, water delivery was flexible enough to support crop identification, and second, there was a consensus that the water delivery schedule would follow the targeted crop production patterns. The complexity and sophistication of LNO's irrigation has already been mentioned. As an aside, the author recognizes that every area which could potentially be a candidate for outgrower arrangements will not start with such an advanced irrigation system. The bottom line is that policymakers must respect the connection between the technology of the irrigation system and the technology required by the proposed cropping pattern.

The efficiency of LNO's water delivery--both technical and administrative--cannot be overemphasized. A few examples are given as testimonial to this factor. While WUGs are a common feature of most irrigation systems, the Operations & Maintenance staff describes itself as "working with people, not working with water," highlighting the crucial role of community mobilization and motivation, and not solely technical know-how. The water engineer is active 7 days a week. The zone men open gates at 3 and 4 a.m. Although canal maintenance was scheduled to take place in November, this was contrary to the wishes of the private sector, thus they have implemented year-round irrigation and adjusted maintenance accordingly.

## ENVIRONMENTAL CONSIDERATIONS

The environmental record of the project did not match the level of achievement which was demonstrated by the project as a whole. The most obvious gap was the lack of forethought regarding how to protect farmers from the toxic chemicals to which they were introduced. Project personnel demonstrated concern and attempted to gauge the extent to which farmers' health was impacted, but the *modus operandi* for many seasons was for farmers to individually judge the risks of insecticide sprays. In most cases, outgrowers underestimated the risks and overestimated the cost and inconvenience of protection. Once animals became sick from eating grass believed to have an accumulation of chemicals, or fish died in natural streams, or growers reported to health centers with skin irritations and complaints of forced breathing, farmers became more diligent in wearing safety suits. They took seriously the advice of health workers to lag the time before entering their fields after spraying. Companies also became more paternalistic, training field staff to insist their outgrowers wear protective gear.

While few farmers have dropped out due to environmental concerns, thereby containing the negative impact upon project performance, policymakers can certainly recognize the seeds of a lesson here. The environmental awareness of farmers must be stressed from the beginning. There must be some provision for an educational environmental component in project design. Furthermore, the private sector must be induced to provide (or sell) protective equipment to farmers, and they must instruct in its proper use. Project personnel must also ensure that some entity is responsible for protecting the source of drinking water from pesticide contamination, and monitoring its purity.

Other environmental factors which have not received much attention to date, but are beginning to show some evidence of decline over the medium-term, include rising levels of salinity and increased difficulties with pests. Salinity concerns either were not anticipated, or a blind eye was turned in that direction. Nevertheless, efforts should be made to acquire technology to protect against rising salinity, which has revealed itself in fresh patches of white-bleached soil in the recent past. The private sector particularly mentioned their experience with burgeoning pest problems over the last two years or so, no doubt fanned by the proliferation of outgrower cropping. Technologies for integrated pest management must be explored, in order to forestall rising disease infestation. Of course, this should occur simultaneously with scheduled crop rotation, and preferably, co-ordination between firms once planted area and pests reach a critical level.

The question of the sustainability of the natural resource base, and especially the crucial forests in the watershed area, is becoming increasingly important to officials in the LNO area, as it should to policymakers concerned with any rural area. There was not even a mention of the forest base in the census survey that is taken to assess the quality of life every two years, until last year. However, a CDD officer of Pang Khon district reported that the lack of wood for fuel prompted the inclusion of this element in the most recent census survey. Based upon experiences here and elsewhere in Thailand, projects must incorporate activities to improve conservation and resource management practices in the watershed area, in order to ensure irrigation resources in the future.

## CHAPTER SEVEN

### COST EFFECTIVENESS OF THE PROJECT

#### COST-EFFECTIVENESS WAS UNSATISFACTORY FOR EARLIEST PROJECT

Although the bulk of funding from AID was given under the IRD Project, it is beyond the scope of this assessment to launch a detailed review of the cost-effectiveness of the IRD Project. As explained previously, a large portion of the project dealt with the construction of the irrigation system and the on-farm distribution channels, and there were tremendous delays in completing this infrastructure. By 1982, only about 20 percent of the area intended for dry season cultivation received water in the dry season. Moreover, it was found that farmers were cultivating even less area than the available water would have allowed<sup>30</sup>. At this point, it seemed that the long-gestating project offered unsatisfactory returns given its cost of \$60 million.

For the portion of the project dealing with eliminating marketing risks and drawing firms, more satisfactory progress took shape in the 1982-85 period, but as pointed out in Chapter One, the managed arrangements were quite limited in scope even by project-end, although they represented a major advance in terms of building a foundation for future arrangements between small-farmer suppliers and agribusiness firms.

#### MARGINAL RETURN ON INVESTMENT SOARED IN THE LATER PROJECT

Later assessments, of course, paint an entirely different picture. In place of construction delays and uncertainty in water management, there were eventually operational canals crossing the downstream command area, and a computerized irrigation system that offered a level of control rarely seen in Northeast irrigation projects. As a result of well-coordinated activities between project personnel and technical assistance, the number of managed arrangements climbed sharply in the later project. As one expert on Thailand's development explained, "The Lam Nam Oon project has been unique for its development of such arrangements within the framework of a government-administered irrigation system and for its demonstration of the potential for a promotional role for government field technicians in bringing the producers and processors together."<sup>31</sup>

An analysis of the ratio of project revenues to operating expenses of the APM Program--which excludes canal O&M costs--indicates the marginal return on investment soared after 1985. Given the significant sunk cost of the irrigation system's construction, it still was far more attractive, in

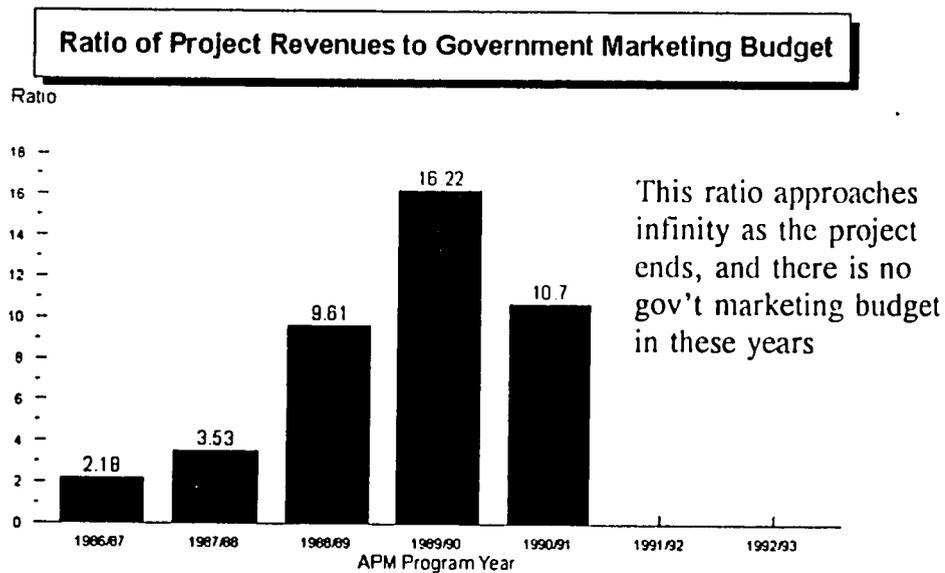
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<sup>30</sup> Farmers refrained from planting for several reasons. They lacked faith that the project would deliver water as promised, even where canal structures were operational. They had no confidence that there would be a market to buy the contemplated crops. Finally, they were in the habit during the dry season of outmigrating to places with assured jobs.

<sup>31</sup> Muscat, Robert J. 1990. *Thailand and the United States: Development, Security and Foreign Aid*. Columbia University Press: New York. p. 205.

the significant sunk cost of the irrigation system's construction, it still was far more attractive, in hindsight, to have spent additional dollars in market development because of the high marginal returns to farmers, and the even higher returns as the project continued. As shown below, the ratio of revenues derived from managed arrangements relative to the marketing budget of the government rose from 2.18:1 to 10.70:1. This shows farmers' revenues required lower per unit investment from government in successive years. Note that the project revenue figure excludes the revenues earned from traditional farming, which would have likely accrued even without the APM Program.

GRAPH 9



While the fifth year's ratio dropped sharply from the previous peak, such fluctuations should not be too worrisome to policy-makers. Keep in mind that once the project was completed, the arrangements proved sustainable without incurring costs for outside intervention. (However, in LNO as in many production schemes which are instituted in irrigated areas, dry season production depends crucially on water management, which in turn requires a budget for canal operation and maintenance. This latter cost may constitute a significant governmental expenditure.)

Although complete investment and cash flow data is not available, a rough attempt to quantify cost-effectiveness can be done if one makes some basic assumptions. These assumptions include the following: (1) a total of \$65 million was spent on construction from 1967-1985--assume one-third of this investment occurred in the first half of the 1970's, a third occurred in the second half of the 1970's, and a third occurred in the first half of the 1980's; (2) the ongoing expense of maintenance and operation of the irrigation system, which is separate from the expense of the APM Program, is not figured in to the "cost" of the project because this same expenditure would have occurred if traditional farming was the sole activity; (3) marketing expenses during the bridge period of 1985-1986 for simplicity can be assumed to have grown in a stepwise fashion over each of these years; (4) the revenues are those which have accrued to contract farmers and traditional farmers, but

because revenue data is not available in all years--assume that prior to 1987 revenues for traditional farming grew in a step-wise fashion, while revenues for contract farmers, who numbered only 171 in 1985, were almost trivial during this period; (5) assume that traditional farming revenues continued until the present at roughly the plateau level of 1988-1991; and (6) other intangible benefits and costs do not have a dollar value and can be ignored. All values are standardized to 1993 numbers, with inflation equal to the rise in producer prices in Thailand over this period. This yields a net negative return as of 1993, as shown in Table 7.

TABLE 7

## ROUGH ESTIMATE OF COST-EFFECTIVENESS

Year	Construction Investment	Gov't Budget for Marketing	Revenues from Trad'l Farm'g	Revenues from Cont't Farm'g	Deflator 1/	Costs In 1993 Dollars	Revenues In 1993 Dollars
	-----\$ million-----					-----\$ million-----	
1970-1974	21.67				40	74.71	
1975-1979	21.67				65	45.97	
1980-1984	21.67				102	29.30	
1985		0.03	0.27	0.02	100	0.03	0.39
1986		0.03	0.53	0.11	99.6	0.03	0.59
1987		0.10	1.07	0.22	105.52	0.13	1.69
1988		0.14	1.50	0.46	114.15	0.16	2.39
1989		0.17	1.54	1.59	119.41	0.19	3.62
1990		0.21	1.42	3.40	123.55	0.23	5.38
1991		0.36	1.56	3.84	131.9	0.38	5.65
1992		0.00	1.56	3.27	132.2	0.00	5.05
1993		0.00	1.56	5.42	137.9	0.00	6.98
TOTAL SO FAR ----->						151.14	32.04

Notes: 1/ The deflator used for the first three intervals is roughly equal to the cost of living at the mid-interval point

Although the activities have not yet recouped the cost of the original investment, there are other purposes in a development project besides making a return on investment. Moreover, one can imagine that there will be a continuous revenue stream in the future which quite possibly rises due to any number of factors (increasing productivity, adoption of higher value-added cropping patterns, expansion of production, and so forth). If this revenue stream continues to grow, which is a conservative scenario, then a certain number of years from now this project may turn the corner.

**BEST AVAILABLE DOCUMENT**

## CHAPTER EIGHT

### LESSONS LEARNED

**Lesson 1: Recognize that the government's role is crucial to engendering trust between farmers and firms.**

The government must bring producers and processors together based upon the demonstrated motivation (and tentative progress) of farmers during cultivation trials, and the proven record of firms when working with farmers elsewhere. The public sector cannot build mutual trust if officials do not know the farmers personally or have not fully investigated the companies. Yet by taking these necessary preliminary steps, government officials are uniquely positioned to strengthen producer-processor ties without arousing suspicion of one-sidedness. They can draw banks into the web of interrelationships, which in turn may coax farmers to participate and may screen out firms which are not serious. Officials who genuinely care that contracting be a win-win situation, and who can be trusted to act as fair intermediaries if conflicts arise, have the best chance to prod both sides to work together.

Officials located on-site are also able to bring impartiality to their policymaking role, and to set ground rules which make dry season cultivation attractive to both sides. Examples of sound policies at LNO--policies which showed an appreciation for the risks of each side--include offering a "concession" for zoned areas in the initial stage, providing a financial "inducement" to farmers during trial production, and "guaranteeing" against the risk of total loss to farmers.

**Lesson 2: Recognize that contract production is not by its nature biased towards any groups.**

In LNO, managed arrangements were successfully undertaken by smallholder farmers. In fact, even households with large parcels left most of their land fallow in the dry season, thereby cancelling out the seeming advantage of larger landholdings. Although almost no persons at LNO were landless, it appears that this would not be an obstacle to joining with firms since land was available for rent. In fact, one unexpected benefit was that even villagers in rainfed areas (outside of the irrigation perimeter) were able to participate and earn financial returns by renting land within the irrigated area. Due to the type of crops produced at LNO, contract farming offered opportunities to earn wages for pollination work, especially for women and teenager. Last but not least, it opened avenues for women to become technicians and managers in the ranks of the private and public sectors.

**Lesson 3: Establish a core working unit on-site which can troubleshoot problems as they arise.**

LNO illustrates that most difficulties on-site can be surmounted by an integrated problem-solving approach which brings together senior people who are always present and who know firsthand the details of the project and the setting. This working unit should include marketing, water delivery, agricultural extension, agricultural research, and community development personnel. Other departments (both on-site and off) with a hand in rural development can communicate with this unit through the Project Director. The working unit should be reasonably small in order to respond

quickly to problems.

**Lesson 4: First, get familiar with the farmers, and only then proceed to coalesce a specific assignment team.**

If project personnel are not familiar with the farmers, it is better to mobilize farmers and improve WUG functioning than to perform outreach prematurely. Once project personnel know which farmers are most eager to adopt new technology, and which villages offer suitable environmental and administrative characteristics, they can begin to form a specific assignment team. Otherwise, coalescing an action-oriented team without a knowledge base will likely falter.

**Lesson 5: Recognize that institutional strengthening and training is instrumental in fomenting the understanding of the government's role and its ability to negotiate with the private sector.**

The public sector more often than not has limited understanding of the concept of the private sector as the leader in rural development, possesses limited experience operating within this premise, and lacks the necessary skills for project identification and marketing extension. Training is necessary to change the public sector's thinking from a traditional approach--where a government agency is seen in the same light as a welfare bureau--to a more business-oriented one. This perspective is usually gained in a market environment. Project personnel who lack such experience can benefit from working side-by-side with consultants who hail from the private sector, visiting places (such as LNO) which offer empirical evidence of private sector-led development, and working with development specialists possessing proven skills in private-sector led growth. The goal of training is to get government to see that rural incomes improve most rapidly with healthy competition, and that healthy competition, in turn, depends upon satisfactory returns to each party.

**Lesson 6: Set a realistic time horizon for the accomplishment of goals.**

Project planners should avoid being overly optimistic in their projections. They should view the first few years of an agribusiness project as a "pilot effort," and set dedicated funds aside for the future, if and when current efforts get off the ground. Generally, project duration must be at least five years, but preferably longer as it takes a minimum of three growing seasons to identify crops which are economically feasible and mutually acceptable to both parties. As happened at LNO, a multi-year project may yield significant results, at best, only in the last few years.

**Lesson 7: Perform crop-testing on-site, with a market orientation, i.e. a view that parallels the concerns which roust the private sector.**

Crop testing must be done on-site in order to measure the feasibility of the proposed crop. It also must be market-oriented. That is, the project must ask the same set of questions which an enterprise seeks to answer when scouting out production sites, and it must provide tangible, quantitative answers that can be used to persuade firms to invest, i.e. the required number of man-days, the local daily wage, expenses associated with transportation, the local cost of inputs, the potential scale of operation, the landholding pattern, the availability of labor, the reliability of water, soil fertility, rainfall, and so forth. However, in order to attain satisfactory quality and/or the maximum price, project officials may need to woo exporters or representatives of foreign import firms to the site early on in order to ensure that crop-testing is indeed closely mimicking known production patterns.

**Lesson 8: Throughout the project, keep in mind that water control is number one in the mind of the private sector.**

LNO offered a major advantage relative to other irrigated projects--superb technical and administrative capacity to control water delivery. Given the requirements of most high-value crops that are intended for export markets nowadays, quality control presupposes reliable water delivery by responsible water engineers, which in this case was the RID. However, pushing the case study further, if the water delivery is not computerized like at LNO--perhaps there exists a natural stream with weirs or some other less complicated system--then the lead actor could conceivably be a farmer cooperative rather than the Irrigation Department. Taking a cue from the project, however, this farmer cooperative must offer sufficient control of the water, an effective decision-making committee, and a taste for commercialized agriculture among its members.

**Lesson 9: Set up a monitoring unit in the post-project period, in order to flag the time when new crops must be identified to keep tempo with changes in the locale's comparative advantage.**

Project design should consider the longer-term needs of the beneficiaries. It should incorporate some entity for monitoring benefits after the project concludes. This entity should seek to flag the transition period when existing crops hold diminishing commercial viability, and new crops may need to be identified. This point is underscored when one considers that the seed business is not likely to stay in this locale forever. As labor costs rise, companies will likely be footloose and move to another area or another country possessing a more advantageous mix of resources. The best way to avoid the devastating impact of large-scale contraction of the private sector is to undertake monitoring and engage in "preventative" project identification of even higher value-added crops.

**Lesson 10: Incorporate preventative measures to protect the populace from the hazards of pesticide sprays.**

While the risk of blood poisoning or contamination of the water source was not an issue in the planning of the APM Project, it is now recognized that measures to introduce farmers to safe pesticide handling is essential to protecting public health. Government must set the example by providing safety equipment and teaching safe spraying practices during trial plot cultivation. It must also ensure that the private sector continues this training. The public sector must monitor the health of the populace and do everything it can to see that companies propagate a reasonable level of concern for farmers; otherwise, if the carrot approach doesn't work, the stick approach should be taken. While environmental problems at LNO do not yet threaten to significantly erode the participation of contract farmers in the near-term, the evident concern for farmers' health at this time may grow to undermine the project over the medium-term.

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## APPENDIX A: A Retrospective Look at Other Contract Farming Sites

Three project sites received funds from the APM Program at LNO, for a duration of two to three seasons, in an attempt by the Royal Thai Government to replicate LNO's success. Funds were used to hire SATS, who trained at LNO for six months, and then returned to their respective project sites with a mission to initiate managed arrangements. Funding for these "satellite" projects ceased in 1991, simultaneously with the completion of the APM Program. Few positive results were attained in the short time that these projects endeavored to strengthen farmer-private sector ties. The most notable progress was recorded at Lampang, in the North of Thailand, where four companies remained after 1991, employing 40 to 50 outgrowers. Most outgrowers cultivated watermelon.

The lists synopsise the progress made, and the lessons learned, at each site.

### Experience of the Songkhla, Thailand Project

1. The private sector did not invest; their interest only extended to project visits from time to time. Few crops were grown, perhaps 5 to 10 *rai* apiece in the dry season, for a maximum of 21 *rai*. Thus the participation of farmers was minimal.
2. Farmers only continued to grow watermelon.
3. After the APM Program ended, there was no staff to supervise the activities, which led to their demise.
4. There was no replication to neighboring plots because there was a problem with brackish water coming onto the farms.

### Experience of the Lampang, Thailand Project

1. Farmers preferred the traditional crops because they were more lucrative than the introduced crops.
2. Farmers didn't want to go into seed production because they found it too difficult from a technical standpoint.
3. Labor was lacking during pollination time because there was a factory in the local area which hired many workers, and particularly female workers.
4. The cost of labor was too high due to the competitive pressure of factory work. Farmers also could not woo hired hands because some factories offered the additional enticement of sending trucks to pick up laborers.
5. Farmers didn't trust the companies for two reasons--there were delays when the firms set appointments with the farmers, and the private sector did not give outgrowers fertilizer in a timely manner.
6. Farmers were isolated and scattered, making water distribution and control difficult.
7. The on-farm system was not suitable for the introduced crops. That is, farmers dug their ditches and dykes themselves, instead of the RID, which caused irregular water pathways and poor water control.
8. Companies sometimes created confusion because their staff lacked experience.
9. Project staff were not assigned a vehicle, so they had to use their own car for transportation, an expense which was not reimbursable. Consequently, they were reluctant to go around to fields and company offices.
10. Social customs in the area, including numerous festivals, took precedence over crop

responsibilities. This interfered with in-field management.

### **Experience of the Kokatiem Project in Lopburi, Thailand**

1. The private sector did not invest because they deemed it too risky.
2. The activities of the companies ceased when the project ended, since firms were not yet convinced of the area's potential, and they did not want to take responsibility for crop production.
3. While a few farmers still grow sweet baby corn which the SATs promoted, the lack of private sector investment caused farmers for the most part to return to traditional cropping of paddy, corn and vegetables, which possess an assured market.
4. There was no replication to neighboring plots because farmers lacked confidence in the market.