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# Thailand

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Gateway to Asian Agribusiness Markets

Agribusiness Investment  
Opportunities

**A Presentation of  
Investment Profiles  
and Opportunities  
in Thailand**

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Contents

	Page	
	iii.	Illustrations
Executive Summary	1	
Summary of Findings	4	
	8	ASACI In-Country Team
	8	ASACI Headquarters Team
Investment #1: A Shrimp Seed Stock Business	11	Summary
	11	Background
	14	Proposed Venture
	15	Market Demand
	15	Size of the Business
	17	Financial Performance
	19	Risk
	21	Thai Investment Partners
Investment #2: Fresh Cut Rose Production and Marketing	25	Summary
	25	Background
	27	Proposed Venture
	28	Market Potential
	28	Market Strategy/Distribution
	29	Competition
	29	Research & Development
	30	Equipment & Supplies
	30	Production & Operations
	31	Financial Performance
	31	Organization & Management
	33	Risk
	34	Conclusion
Investment #3: An Animal Waste Biofeed Business	39	Summary
	39	Background
	42	Proposed Venture
	43	Specific Opportunities
	43	Analysis of Investment
	44	Anaerobic Management
	46	Anaerobic Digester Products
	48	Biofeed Price & Revenues
	49	Market & Marketing
	53	Potential Business Strategy
Investment #4: Honey and Bee Products Processing	59	Summary
	60	Background
	61	Proposed Venture
	61	Objectives
	62	Seasonality of Business

Contents continued

	Page	
Investment #4: Honey & Bee cont'd	63	Research/Regulatory Influences
	63	Market Analysis
	64	Company Structure/Mangement
	64	Risk
	65	Thai Partners
	66	Financial Performance

PARTIALLY EVALUATED OPPORTUNITIES (5-9)

Investment #5: Seed/Bulb/Rootstock	73	Summary
Production and Processing	73	Background
	74	Proposed Venture
	75	Financial
Investment #6: Peanut Snack Foods	79	Summary
Manufacture and Marketing	79	Background
	80	Proposed Venture
	80	Problems and Solutions
	81	Opportunity
Investment #7: Cut Flower Imports from the U.S.	85	
Investment #8: Cut Flower and Foliage Exports	89	Summary
	90	Proposed Venture
	90	Market and Sales
	91	Risk
Investment #9: Peanut Production & Quality Improvement	95	
Appendix A - ASACI	101	
Appendix B - Team Biographies	103	
Appendix C - In-Country Agribusiness Assessment	111	
Appendix D - Contact List	135	
Bibliography	139	
Acknowledgments	143	

## Illustrations

	Page	
Figure 1	2	Thailand Economic Growth
Figure 2	12	Shrimp Production Cycle
Table 1	15	Shrimp Prices
Table 2	16	Shrimp Cash Flow Projections
Table 3	17	Shrimp Sales Production
Table 4	18	Shrimp Income Statement
Figure 3	19	Internal Rate of Return vs. Postlarvae Price
Table 5	20	Shrimp Balance Sheet
Figure 4	22	Shrimp Sales Opportunities
Figure 5	24	"Thailand could become flower-trade hub" article
Table 6	27	Rose Investor Contributions
Table 7	28	Rose Grades & Prices
Table 8	31	Rose Production Seasons
Table 9	32	Rose Income Statement
Table 10	33	Rose Balance Sheet
Table 11	34	Rose Internal Rate of Return
Figure 6	41	Alge Culture System
Figure 7	42	Feed Ingredients - Protein vs. Price
Table 12	44	Pig Farm Population Characteristics
Table 13	44	Characteristics of the Wastes Produced
Figure 8	45	Animal Waste Processing Diagram
Table 14	47	Daily Production in Anaerobic System
Table 15	50	Biofeed Sales Projections
Table 16	50	Biofeed Facility Capital Costs
Table 17	51	Waste Income Statement
Table 18	53	Waste Balance Sheet
Table 19	54	Waste Cash Flow Projections
Figure 9	55	Internal Rate of Return vs. Farm Size
Table 20	64	Honey Domestic/Export Target
Figure 10	65	Bee Product Projected Sales
Table 21	67	Honey Income Statement
Table 22	68	Honey Balance Sheet

Illustrations continued...

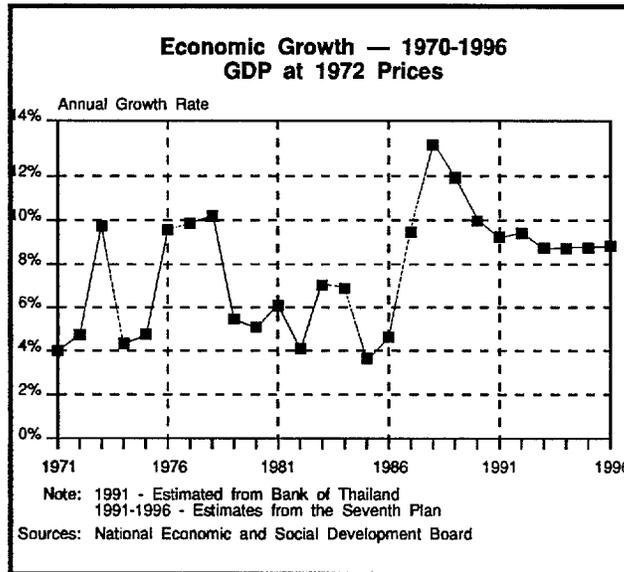
	Page	
Table 23	69	Honey Source of Funds
Table 24	69	Honey Internal Rate of Return
Table 25	74	Seed/Bulb Primary Crops
Table 26	74	Open Pollinated Flowers
Figure 11	121	Thailand Electricity Capacity and Demand 1991-1996
Table 27	124	Thailand Higher Educaiton Institutions
Table 28	132	Commercial Banks Operating in Thailand
Table 29	133	Where the Money Goes - Influx of foreign direct Investment to developing countries

## EXECUTIVE SUMMARY

Under the Royal Thai Government's Seventh Five-Year National Social and Economic Development Plan (1991 - 1996), the government plans to enhance the efficiency of human and natural resources, sharpen product competitiveness through improving production and marketing methods, and maintain a 5 percent growth rate to 1992. The latest Thailand Economic Report forecasts a 10 percent rate of growth for the next three years (see Figure 1).

In keeping with Thailand's Economic Plan, joint development goals of the U.S. Agency for International Development and Thailand seek to stimulate sustainable partnerships and enhance long-term trade and market relationships. These goals are to be accomplished through sustained growth of the economy, broadening the benefits of economic growth by creating new jobs and increasing incomes, and managing the environment by improving quality of life and preserving the environment. Specific development problems that can be addressed by U.S.-Thai business collaboration promoted through cooperation with U.S. private sector organizations such as ASACI are: shortage of skilled labor and appropriate technology transfer, improvement of financial markets and infrastructure, and increasing unequal distribution of wealth due to rapid industrial growth paralleling a still prevalent agricultural-based economy.

Figure 1



Since the agricultural sector is the mainstay of Thailand's economy, the agricultural and agribusiness industries have been strongly targeted by the Government of Thailand for special benefits and incentives. They are:

- Support for agribusiness development from Government and business sections of Thailand.
- A stable economic and social climate.
- Tax incentives for U.S. agribusiness investors.
- GNP growth in double digits for last five years.
- Access to the major markets of Japan.
- Opportunity for marketing linkages with U.S. agribusiness firms.
- Enhanced ability for transfer of technology to Thai agribusiness entities.

- Support from both USAID and the Thailand Ministry of Agriculture (MOAC).

These advantages were substantiated by the ASACI team members who surveyed the Thailand American Chamber of Commerce, the Government of Thailand, members of the Thailand private agribusiness sector and, most importantly, the agribusiness producer at the grassroots level.

The attitudes expressed from the business and agricultural communities, along with Thailand's governmental and environmental concerns, suggest that the Thailand agribusiness climate has matured and is ready for substantial American agribusiness investment and development assistance.

Dialogue with agribusiness leaders, along with information from past agribusiness activities, showed that a majority of companies rated the overall investment climate in Thailand, relative to other Asian countries competing for foreign investment capital, as very good.

In studying the Thailand agricultural economy, the ASACI assessment team found the systems approach at work in various sub-sectors of the agribusiness economy.

For example, Thailand's broiler (chicken) industry has a systems approach as well as its prawn industry and a portion of the dairy industry.

ASACI also found the systems approach working very well in vegetable seed production at the Lam Nam Oon project.

Even though ASACI has positively endorsed agribusiness investment in Thailand, there are several challenges to face when promoting economic prosperity in Thai agribusiness.

Farmers throughout the world have traditionally valued their independence over economic prosperity. Agribusiness has traditionally valued its ability to buy at the lowest price at the time of harvest, and, traditionally, each side has looked at the other with distrust. Thus, the challenge is to develop a mutual trust and enforce a system of contract agreements.

ASACI has noted other concerns that affect the agribusiness environment in Thailand. Even though they are relatively insignificant, the American investor should be aware of the following:

- Government of Thailand support for small landholder agriculture.

- Thai partner insistence that final decision makers (managers) be Thai nationals.
- Inadequacies in the legal system (contract management and enforcement).
- Moderate infrastructure concerns (roads and telecommunications).
- A minor downturn in the economy.

In conclusion, the American Society of Agricultural Consultants International team feels that Thailand has several inherent comparative advantages for foreign investment -- an accessible location, a healthy economy primarily dominated by the private sector, cost-effective labor, abundant natural resources, and a stable social and political environment.

## Summary of Findings

The following summaries and findings are discussed in the presentation that follows. They are the result of substantial in-country research of agricultural investment opportunities with profit potential and is the culmination of information gathered by two teams of ASACI expert consultants (see Appendix A for information on the ASACI organization and its "International Agribusiness Development Program for Modern Food Systems" and Appendix B, ASACI team biographies). A three-man reconnaissance team visited Thailand in August 1991 (see Appendix C, Thailand Country and Agribusiness Assessment) and a six-man project investment team traveled to Thailand in November 1991. Appendix D is a list of contacts made in the process of obtaining information for investment opportunities. Each opportunity profiled discusses vital information needed for the initial step in qualifying an investment, such as projected balance sheet and income statement figures, rates of return, risk, market demand, competition and complete project descriptions.

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### **Summary:**

Opportunities for a **shrimp seed stock** business exists to supply the shrimp farming industry in Thailand and surrounding locations in Southeast Asia. The business could supply quality female shrimp to facilities with the capacity to spawn shrimp and produce nauplii, or supply nauplii to hatcheries, or supply postlarvae to farms.

### **Finding:**

Three Thai companies are now operating moderately sized shrimp farms and have expressed an interest in participating in a proposed business. Based on projected operating costs of about \$1 million, sustained pre-tax profits of approximately \$620,000 will be achieved by the end of the second year. The internal rate of return is 120 percent.

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### **Summary:**

**Northern Rose Farm (NRF)** is the proposed name for a new joint venture company to be formed between an existing commercial rose farm in Chang Mai holding 60 percent of the shares and an outside investor holding 40 percent. The farm will produce commercial cut roses under controlled atmosphere conditions. The U.S. partner will contribute \$25,000 in high quality root stock of improved rose varieties, initial working capital, and technical management, experience and training. Capital in the form of \$40,000 in operating equipment will be provided by the Thai partner.

### **Finding:**

Net income after taxes is \$8,000 in the first year and climbs steadily to \$42,000 by the end of the fifth year. An internal rate of return of 32 percent is projected.

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**Summary:**

There is an investment opportunity to establish a joint venture with an existing swine and egg farm operation to **process animal manures to produce energy (methane) and feed ingredients** for the extensive shrimp farming industry in Thailand and surrounding locations in Southeast Asia.

**Finding:**

The owners of an existing pig farm have expressed an interest in participating in a joint venture. A suggested arrangement would be where the anaerobic digestion system would be financed by an investor who has expertise with the required technology. The existing farm would provide the site, the raw material and use of an existing feed mill with value of the biogas open to negotiations. A second farm in southern Thailand also wishes to consider a joint venture. Total capital costs to develop an anaerobic treatment system for the first year is estimated at \$4.25 million of which approximately \$3.5 million are construction costs. Revenues are generated from sales of biofeed and value of the electricity contributed back to the farm. Annual profits are projected of an estimated \$545,000 per year. The internal rate of return is 9.17 percent. However with economies of scale the IRR could reach 40 percent.

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**Summary:**

An opportunity exists for a new joint venture to **purchase, process and market honey and high value products** derived from royal jelly and bee pollen and sold to wholesalers and distributors in Thailand and other Asian countries.

**Finding:**

The new venture will be developed from an existing honey products operation based in Chiang Mai, which has been in operation for more than 15 years. The Thai company will own 60 percent of the shares with 40 percent ownership by the foreign partner. The venture requires capital for a new processing plant, strong research, development and marketing operations. An initial capital base of \$300,000 is assumed for startup. Working capital needs will be met by contributions from both partners. Net income after taxes is \$58,000 in the first year and climbs to \$175,000 in the fifth year. The internal rate of return is 26 percent during the first five years.

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**Summary:**

An opportunity exists for **propagation and sale of introduced commercial varieties** in Thailand, which could be developed as a joint venture with an existing seed/bulb farm or as a separate business. A tissue culture project is also promising.

**Finding:**

Along with the sale of bulbs, the U.S. farm could expect a return based on the improved sales of bulbs and a seat on the board for monitoring and assistance. A foreign partner which would specialize in research and development of new varieties is recommended.

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**Summary:**

An opportunity exists to introduce dry roasted, shelled, skinless plain and flavored peanuts to the domestic Thai and nearby export markets by establishing a **snack foods production plant** in Northeastern Thailand.

**Finding:**

Local Thai businessmen familiar with the national and regional markets are ready to invest in a state-of-the-art American style snack food plant with American quality control. The foreign partner's involvement can range from a minimum of services in providing the various technical know-how to investing in a substantial equity position in the venture.

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**Summary:**

Opportunities exist for U.S. flower exporters to access the new and growing market of Thailand by importing cut flowers and other floral products to Thailand from the U.S. Most of the nearly \$2 million of flowers that Thailand currently imports originates from the Netherlands, Malaysia and other Asian countries.

**Finding:**

There is an increased number and frequency of flights between Thailand and the U.S. by American flag carriers. The carriers' representatives in Thailand are eager to support any U.S. shippers that want to sell to Thailand and can offer preferential rates with sufficient volumes.

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**Summary:**

A significant opportunity exists for investment in an **integrated cut flower and foliage company** based in Thailand. The venture could be developed by a Thai-owned company with linkage to an internationally known flower company.

**Finding:**

Thailand now ships an estimated \$25 million in flowers to countries around the world. Thailand has plans for expansion to the European Common Market and Japan, as well as the U.S. There is high profit potential for investors willing to surmount the climate, technical and management concerns.

**Summary:**

An opportunity exists to **market improved variety peanuts as well as harvest, handle, and provide drying equipment** thereby increasing peanut production and quality improvement in Thailand for internal consumption and regional export.

**Finding:**

Preliminary discussion with Thai cooperative representatives and village farmers indicate an interest in, and willingness to try, new methods resulting in a reorganization of field shapes and sizes.

## ASACI IN-COUNTRY TEAM

Michael E. Peden, MBA  
(Project Director/Team Leader)  
Vice President  
International Agribusiness Projects  
American Society of Agricultural  
Consultants, International  
McLean, VA

Joseph H. Marshall, Ph.D.  
(Team Chairman)  
President  
Southern Plantations Group, Inc.  
Albany, GA

Marshall Burkes, Ph.D.  
(agri-investment specialist)  
President  
AMBUR  
Madison, WI

Roy E. Ferguson, II, BS  
(agri-business advisor)  
Chief Executive Officer  
The Ferguson Group (Tulsa), Ltd.  
Tulsa, OK

Robert Shleser, Ph.D.  
(aquiculture specialist)  
President  
The Concepts Group  
Waimanalo, HI

Tim Welsh, BS  
(Asian research economist)  
Managing Director  
AgriSource, Ltd.  
Bangkok, Thailand

William Zappettini, Jr., BBA  
(floricultural specialist)  
Zappettini Consulting Company  
Atherton, CA

## ASACI HEADQUARTERS TEAM

Kelly M. Harrison, Ph.D.  
Executive Vice President  
American Society of Agricultural  
Consultants  
McLean, VA

Michael E. Peden, MBA  
Vice President  
International Agribusiness Projects  
American Society of Agricultural  
Consultants, International  
McLean, VA

Cynthia A. Leigh, BGS  
International Projects Coordinator  
American Society of Agricultural  
Consultants, International  
McLean, VA

*INVESTMENT #1: A SHRIMP SEED  
STOCK BUSINESS*

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<u>11 Summary</u>
<u>11 Background</u>
<u>14 Proposed Venture</u>
<u>15 Market Demand</u>
<u>15 Size of the Business</u>
<u>17 Financial Performance</u>
<u>19 Risk</u>
<u>21 Thai Investment Partners</u>

SUMMARY

The shrimp seedstock business is an investment opportunity to produce shrimp broodstock and seed stock to supply the shrimp farming industry in Thailand and surrounding locations in Southeast Asia.

BACKGROUND

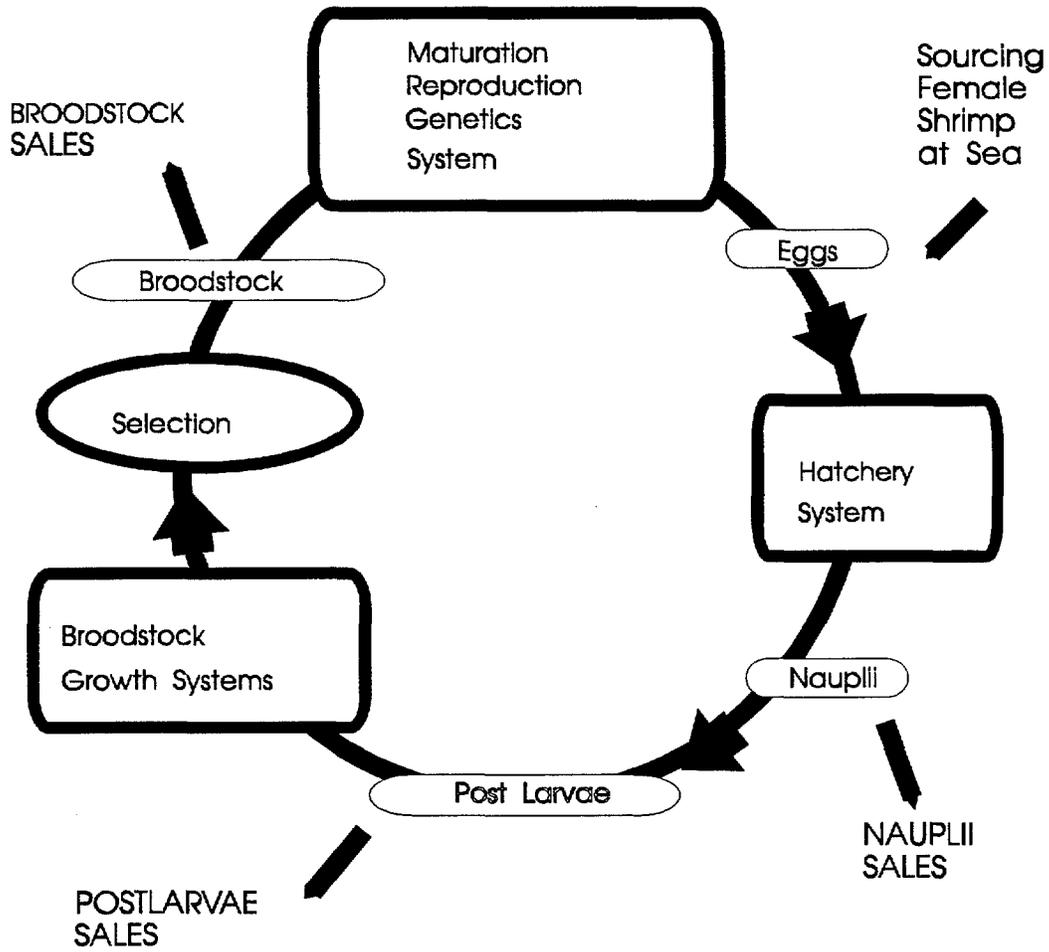
World shrimp production has increased from 3 to 4 billion pounds per year in the last three years. This increase has been primarily due to the expansion of shrimp farming. The growth of shrimp farming in Thailand has been dramatic. In 1988 production was 55,000 metric tons, a 320 percent increase over the previous year. Production in 1989 jumped to more than 100,000 metric tons. However, by 1990 production had leveled off due to technical problems such as disease, pollution, and supply of shrimp seed. Nevertheless, Thailand remains the second largest shrimp producer in the world and is the largest producer of Tiger Prawns (*Penaeus monodon*).

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Figure 2

# SHRIMP PRODUCTION CYCLE



Thailand has about 600 km of coastal land suitable for aquiculture. It is estimated that there are more than 4,000 small shrimp farms in Thailand. Most of the small shrimp farms cover about 2-10 rai ( 0.5 to 2.5 acres). There are a few large enterprises such as those owned by C.P. (Charoen Pokphand Co.) and Aquastar, a division of the British firm, B.P. Nutrition. Aquastar now has more than 300 ponds under its control, and C.P. has more than 8,500 rai (3,500 acres) in contract grower ponds.

The shrimp farming industry is dependent on two primary external inputs to maintain current levels of production: Shrimp postlarvae (seed) and shrimp feed. If the industry is to remain productive and/or expand, a reliable supply of these vital elements at a competitive price is required. Breeding shrimp in captivity is essential to maintaining a reliable supply of seed stock for the shrimp farming industry.

A brief description of the details of shrimp breeding and larval development provides a perspective on the proposed business.

Shrimp farming is generally partitioned into the following elements:

- BROODSTOCK
- HATCHERY
- PRODUCTION
- HARVESTING AND PROCESSING

Figure 2 shows the various stages of development in the shrimp life cycle followed by a description of the activities involved in intensive shrimp farming.

In Thailand the breeding of shrimp in captivity has not been mastered at a commercial level. As a result the industry is now dependent on obtaining broodstock that are fertilized or in spawning condition from the sea. These shrimp are sold to specialized facilities called hatcheries. In the hatchery female shrimp release fertile eggs or "spawn". The eggs develop and hatch producing a small, frail, spider-like form called "Nauplii." The larval development cycle is completed over a period of 10 days. During this time the larvae are provided specialized feeds while they complete the development phases of nauplius zoea and mysis to become "Postlarvae."

Postlarvae weigh about 0.1 gram and have a length of 15 millimeters. They are generally held another 15-20 days before they are considered hearty enough to be transferred to the farm ponds to be grown to market size. The hatchery is the most complex technical step in shrimp farming. Survival of 40-50 percent can be achieved in a hatchery operated by well trained technicians.

#### PROPOSED VENTURE

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Larger hatcheries in Thailand, which are few in number, have the capacity to raise the larvae through a full development cycle. However, they generally obtain female shrimp or "broodstock" that are in spawning condition from fishermen who catch them at sea. The supply of broodstock is inconsistent due to seasonal variations, weather, over fishing and periodic stress caused by pollution. Most of the smaller hatcheries do not have the capability for holding or spawning the broodstock. These hatcheries purchase excess nauplii from the larger hatcheries and complete the larval rearing cycle to produce postlarvae to supply their own farms or for sales to smaller farms that have no hatcheries.

Disease is a factor that has great impact on the entire shrimp farming industry. Most of the shrimp hatcheries in Thailand are contaminated with virus. Shrimp production can be sustained in the presence of viruses; however, performance of infected shrimp in the hatchery and on the farm is generally diminished. A business that can provide virus free broodstock, nauplii, and postlarvae will have a dramatic impact on the entire industry.

Technology for breeding shrimp in captivity is practiced at commercial levels in several locations outside of Thailand. "The business proposed to be established will transfer Shrimp Breeding Technology to Thailand and Supply Virus-Free Selected Broodstock, Nauplii and Postlarvae to all Segments of the Industry."

Broodstock certified to be free of virus, and selected for improved performance under intensive production conditions will be used to establish the business.

Opportunities for business exist on three levels:

- Supplying quality female shrimp to facilities with the capacity to spawn shrimp and produce nauplii,

- Supplying nauplii to hatcheries, or
- Supplying postlarvae to farms.

The recommended business opportunity is to establish a highly controlled broodstock development, breeding, and hatchery facility to produce the three preceding products to meet demand in various segments of the market. In analyzing the opportunity for this business, a vital factor is the market price of the product which fluctuates and is dependent on the availability of female shrimp. Table 1 presents the current prices for the products and those used in the financial projections.

In the hatchery phase of shrimp production, survival from egg to postlarvae seldom exceeds 40 percent.

Thus, at least 20 billion shrimp eggs per year are required. One sexually mature female shrimp produces from 200,000 to 500,000 eggs each time it spawns.

With an average of 350,000 eggs produced per female, more than 55,000 female shrimp must be available annually to support the industry in Thailand.

Shrimp farming is now developing in Vietnam and Cambodia. This creates additional markets for broodstock and shrimp seed in the region.

Table 1

PRODUCT	CURRENT PRICE	PROPOSED SALES PRICE
Female Shrimp	\$45.00 Each	\$20.00 Each
Shrimp Postlarvae	\$7.00/1,000	\$5.00/1,000
Shrimp Nauplii	\$0.50/1,000	\$0.25/1,000

The prices for the products listed under "Proposed Sales Price" above were used to evaluate the financial performance of the business.

#### MARKET DEMAND

In 1990 production of 100,000 metric tons of shrimp (220 million pounds per year) required more than 8 billion postlarvae to stock the shrimp ponds.

#### SIZE OF THE BUSINESS

The proposed facility will have the capacity to produce 250 million postlarvae, 45,000 broodstock and 300 million nauplii annually. The initial production will be limited to 250,000 post larvae ( 3 percent of the market), 5,000 female broodstock (10 percent of the estimated demand), and 1 billion nauplii (5 percent of the demand ) annually.

Table 2

<b>CASH FLOW PROJECTIONS</b>					
<b>SOURCES of CASH</b>	<b>YR 1</b>	<b>YR 2</b>	<b>YR 3</b>	<b>YR 4</b>	<b>YR 5</b>
Net Income	(365,532)	672,349	626,838	628,212	589,587
Depreciation	93,981	236,183	274,972	313,598	352,223
<b>Cash from Operations</b>	<b>(271,550)</b>	<b>908,532</b>	<b>901,810</b>	<b>941,810</b>	<b>941,810</b>
<b>Cash Provided By Changes In:</b>					
Accounts Payable	64,535	3,383	644	(115)	3,219
<b>Net Cash Provided By</b>	<b>(207,016)</b>	<b>911,915</b>	<b>902,454</b>	<b>941,695</b>	<b>945,029</b>
<b>Operating Activities</b>					
<b>FINANCING TRANSACTIONS</b>					
Equity (US \$)	1,350,000	0	0	0	0
Loans	0	0	0	0	0
<b>Net Cash From Financing</b>	<b>1,350,000</b>				
<b>TOTAL SOURCES</b>	<b>1,142,984</b>	<b>911,915</b>	<b>902,454</b>	<b>941,695</b>	<b>945,029</b>
<b>APPLICATIONS of CASH</b>					
Facilities	931,196	41,560	12,416	6,800	6,800
Loan Repayments	0	0	0	0	0
Dividends	0	0	0	0	0
Changes In Acc.Recei	32,314	2,083	103,192	0	0
Changes in Inventory	5,615	(1,565)	12,168	0	0
<b>TOTAL APPLICATIONS</b>	<b>969,125</b>	<b>42,078</b>	<b>127,776</b>	<b>6,800</b>	<b>6,800</b>
<b>Net Cash Flow/Period</b>	<b>173,859</b>	<b>869,837</b>	<b>774,678</b>	<b>934,895</b>	<b>938,229</b>
<b>CASH ON HAND</b>	<b>173,859</b>	<b>1,043,696</b>	<b>1,818,373</b>	<b>2,753,269</b>	<b>3,691,498</b>
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Table 3

SALES PRODUCTION						
Postlarvae Prod. (1,000)	65,054	260,215	260,215	260,215	260,215	260,215
Nauplii Prod. (1,000)	250,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Broodstock Prod.	0	5,000	5,000	5,000	5,000	5,000
REVENUE						
Postlarvae (@ \$5.00/ 1000)	325,269	1,301,077	1,301,077	1,301,077	1,301,077	1,301,077
Nauplii (@ \$0.25/1000)	62,500	250,000	250,000	250,000	250,000	250,000
Broodstock (@ \$20.00/1000)	100,000	100,000	100,000	100,000	100,000	100,000

The facilities will be built over a period of nine months. Production of nauplii and post larvae will begin in the third quarter of the first year. Broodstock sales will begin in the second year.

#### FINANCIAL PERFORMANCE

**Capital Requirements:** The capital costs of the facilities are approximately \$930,000. Startup capital represents an additional \$500,000. See Table 2 (Cash Flow Projections) for details of the capital expenditures.

**Revenues:** This analysis is based on the assumption that the costs of establishing the venture will be financed entirely from equity investment by the participants. No attempt has been made to inflate or diminish prices or outputs by making assumptions about the future.

Sales revenues begin in the third quarter with the production of nauplii and postlarvae. Broodstock sales begin in year two. Annual revenues of about \$1.6 million are achieved by the end of the second year. Based on projected operating costs about \$1 million, sustained pre-tax profits of about \$620,000 per year will be achieved by the end of the second year. (See Table 3, Sales Production and Figure 3, Postlarvae Price)

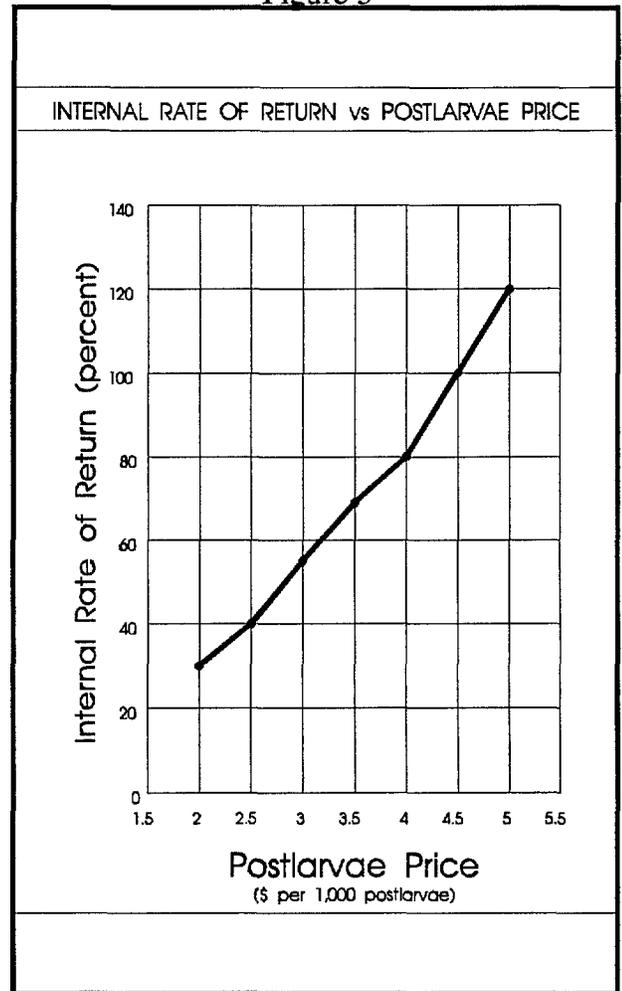
**Income Statement:** The sources of revenues are shown in detail in Table 4. The primary costs of production are : Artemia ( brine shrimp) are small crustaceans that are provided for laval food. The chemicals are used to grow algae or phytoplankton that are also used as food in larval culture. Labor is the item associated with day- to-day operations. Salaries represent personnel costs for management and administrative functions. The annual production costs are approximately \$1 million. Pretax profits of about \$620,000 per year are achieved in the second year. The details are presented in Table 4, Income Statement.

**Internal Rate of Return (IRR):** The IRR is still above a level that is considered attractive for any business in spite of the fact that the sales prices projected for postlarvae, nauplii and broodstock were substantially below the current market prices for these products. In order to evaluate the impact of postlarvae price on economic performance, the IRR was calculated using price of postlarvae ranging from two to five dollars. (See Table 4, Income Statement and Figure 3, Internal Rate of Return vs. Postlarvae Price)

Table 4

<b>INCOME STATEMENT</b>					
<b>REVENUE: US\$</b>	<b>YR 1</b>	<b>YR 2</b>	<b>YR 3</b>	<b>YR 4</b>	<b>YR 5</b>
Postlarvae Sales	325,269	1,301,077	1,301,077	1,301,077	1,301,077
Nauplii Sales	62,500	250,000	250,000	250,000	250,000
Broodstock Sales	0	100,000	100,000	100,000	100,000
<b>Total Sales</b>	<b>387,769</b>	<b>1,651,077</b>	<b>1,651,077</b>	<b>1,651,077</b>	<b>1,651,077</b>
<b>VARIABLE COSTS:</b>					
Artemia	35,243	70,485	70,485	70,485	70,485
Broodstock Feed	7,577	10,103	10,243	10,243	10,243
Electrical (Pumping)	116	232	232	232	232
Electrical (Aeration)	2,836	5,672	5,672	5,672	5,672
Fuel	1,400	2,000	2,000	2,000	2,000
General Maintenance	2,300	4,000	4,000	4,000	4,000
Chemicals	35,733	45,821	45,897	45,897	45,897
Direct Labor	28,800	55,920	55,920	55,920	55,920
Bags & Boxes	1,626	7,806	7,806	7,806	7,806
Broodstock	40,287	0	0	0	0
Misc. supplies	1,626	6,505	6,505	6,505	6,505
<b>TOTAL VARIABLE COST:</b>	<b>157,544</b>	<b>208,545</b>	<b>208,762</b>	<b>208,762</b>	<b>208,762</b>
<b>VARIABLE EXPENSES:</b>					
Freight/Insurance	0	0	0	0	0
<b>TOTAL DIRECT COSTS:</b>	<b>157,544</b>	<b>208,545</b>	<b>208,762</b>	<b>208,762</b>	<b>208,762</b>
<b>GROSS PROFIT:</b>	<b>167,725</b>	<b>1,092,532</b>	<b>1,092,315</b>	<b>1,092,315</b>	<b>1,092,315</b>
<b>GENERAL &amp; ADMINISTRATIVE:</b>					
Salaries	128,000	146,000	146,000	146,000	146,000
Consultants	40,000	40,000	40,000	20,000	20,000
Benefits	25,600	29,200	29,200	29,200	29,200
Insurance	12,000	12,000	12,000	12,000	12,000
Land Lease	12,000	12,000	12,000	12,000	12,000
Legal & Account	4,000	4,000	4,000	4,000	4,000
Office Supplies	4,000	4,000	4,000	4,000	4,000
Travel & Comm.	20,000	15,000	15,000	15,000	15,000
<b>TOTAL</b>	<b>G &amp; A</b>	<b>245,600</b>	<b>262,200</b>	<b>262,200</b>	<b>242,200</b>
<b>OTHER FIXED COSTS:</b>					
Fixed Labor	9,600	9,600	9,600	9,600	9,600
Marketing	0	0	6,505	6,505	6,505
Depreciation	93,981	236,183	274,972	313,598	352,223
<b>TOTAL FIXED COSTS:</b>	<b>349,181</b>	<b>507,983</b>	<b>553,277</b>	<b>571,903</b>	<b>610,529</b>
<b>TOTAL COSTS:</b>	<b>752,325</b>	<b>978,728</b>	<b>1,024,239</b>	<b>1,022,865</b>	<b>1,061,490</b>
<b>PRE TAX NET PROFIT</b>	<b>(364,556)</b>	<b>672,349</b>	<b>626,838</b>	<b>628,212</b>	<b>589,587</b>
<b>NET PROFIT AFTER TAX</b>	<b>(364,556)</b>	<b>672,349</b>	<b>626,838</b>	<b>628,212</b>	<b>589,587</b>
<b>NET INCOME</b>	<b>(956,171)</b>	<b>1,129,172</b>	<b>1,159,099</b>	<b>1,184,715</b>	<b>1,184,715</b>

Figure 3



**Balance Sheet:** The balance sheet identifies the assets, liabilities and depreciation factors used in evaluating the financial performance (see Table 5, Balance Sheet). No dividends are shown. The profits are reflected as retained earnings.

**Cash Flow:** The method chosen for financing the business was based on equity. As a result, no loan payments are shown in the cash flow statement. The capacity of the business to rapidly repay the capital makes this approach realistic. Reasonable leveraging would increase return on equity without endangering the project. (See Table 2, Cash Flow Projections)

### RISK

There are numerous risks in aquiculture. Farming of shrimp is subject to many risks including disease, storms, and theft.

These risks are eliminated by limiting the scope of the operation to the hatchery activities.

Nevertheless, the following risks must be addressed: The proposed venture is based on the mastery of the technology of breeding in captivity. In the hatchery a major risk is associated with the necessity of raising broodstock to sexual maturity and then creating conditions which are conducive to mating the shrimp in captivity. Assembling a highly experienced technical team who have achieved a mastery of most of the technical problems will improve the potential for success. Success will be heavily dependent on the skills of the technical team assembled for this activity.

Table 5

<b>BALANCE SHEET</b>					
	<b>YR 1</b>	<b>YR 2</b>	<b>YR 3</b>	<b>YR 4</b>	<b>YR 5</b>
Cash	173,859	1,043,696	1,818,373	2,753,269	3,691,498
A/R	32,314	34,397	37,590	37,590	37,590
Inventory	5,615	4,050	16,218	16,218	16,218
<b>Total Current Assets</b>	<b>211,788</b>	<b>1,082,143</b>	<b>1,972,181</b>	<b>2,907,077</b>	<b>3,845,305</b>
Plant & equipment	931,196	972,756	985,172	991,972	998,772
Long-Term Assets	837,214	642,591	380,035	73,238	(272,186)
<b>TOTAL ASSETS</b>	<b>1,049,003</b>	<b>1,724,735</b>	<b>2,352,216</b>	<b>2,980,314</b>	<b>3,573,120</b>
Accounts Payable	64,535	67,918	68,562	68,447	71,666
Long-term Debt	0	0	0	0	0
<b>TOTAL LIABILITIES</b>	<b>64,535</b>	<b>67,918</b>	<b>68,562</b>	<b>68,447</b>	<b>71,666</b>
<b>EQUITY:</b>	<b>1,350,000</b>	<b>1,350,000</b>	<b>1,350,000</b>	<b>1,350,000</b>	<b>1,350,000</b>
Retained earnings	0	(365,532)	306,817	933,655	1,561,867
Dividends paid	0	0	0	0	0
Net income	(365,532)	672,349	626,838	628,212	589,587
<b>TOTAL EQUITY</b>	<b>984,468</b>	<b>1,656,817</b>	<b>2,283,655</b>	<b>2,911,867</b>	<b>3,501,454</b>
<b>TOTAL LIAB &amp; EQUITY</b>	<b>1,049,003</b>	<b>1,724,735</b>	<b>2,352,216</b>	<b>2,980,314</b>	<b>3,573,120</b>
Cash	173,859	1,043,696	1,818,373	2,753,269	3,691,498
A/R	32,314	34,397	137,590	137,590	137,590
Inventory	5,615	4,050	16,218	16,218	16,218
<b>Total Current Assets</b>	<b>211,788</b>	<b>1,082,143</b>	<b>1,972,181</b>	<b>2,907,077</b>	<b>3,845,077</b>
Plant & equipment	931,196	972,756	985,172	991,972	998,772
Less Acc. Depreciation	93,981	330,165	605,137	918,734	1,270,957
Long-Term Assets	837,214	642,591	380,035	73,238	(272,186)
<b>TOTAL ASSETS</b>	<b>1,049,003</b>	<b>1,724,735</b>	<b>2,352,216</b>	<b>2,980,314</b>	<b>3,573,120</b>
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<b>TOT. LIAB &amp; EQUITY</b>	<b>1,049,003</b>	<b>1,724,735</b>	<b>2,352,216</b>	<b>2,980,314</b>	<b>3,573,120</b>

A unique aspect of the proposed business is that it is dedicated to producing broodstock, nauplii, and postlarvae that are free of viruses. Disease will be a constant threat. The business will always be vulnerable to infection. The venture will be dependent on the capacity to screen the startup stocks to assure that they are free of viruses. Constant evaluation of broodstock and tight management are the only ways of protecting the business from this threat.

#### THAI INVESTMENT PARTNERS

The ASACI team felt that it is impractical to propose another farming project based on the fact that there may be more than 4,000 small shrimp farms in Thailand. However, supplying the high quality seed that is critical to sustaining the industry presented itself is a unique opportunity. This concept was discussed in detail with small, medium, and large sized producers of shrimp throughout Thailand. All groups and individuals contacted agreed that the proposed project focused on the single factor that is critical to developing and sustaining the shrimp farming industry.

Three companies that are now operating moderate sized shrimp farms have expressed an interest in participating in the proposed business.

Two of the companies already operate small hatcheries that are dependent on purchasing broodstock aptured at sea.

Figure 4

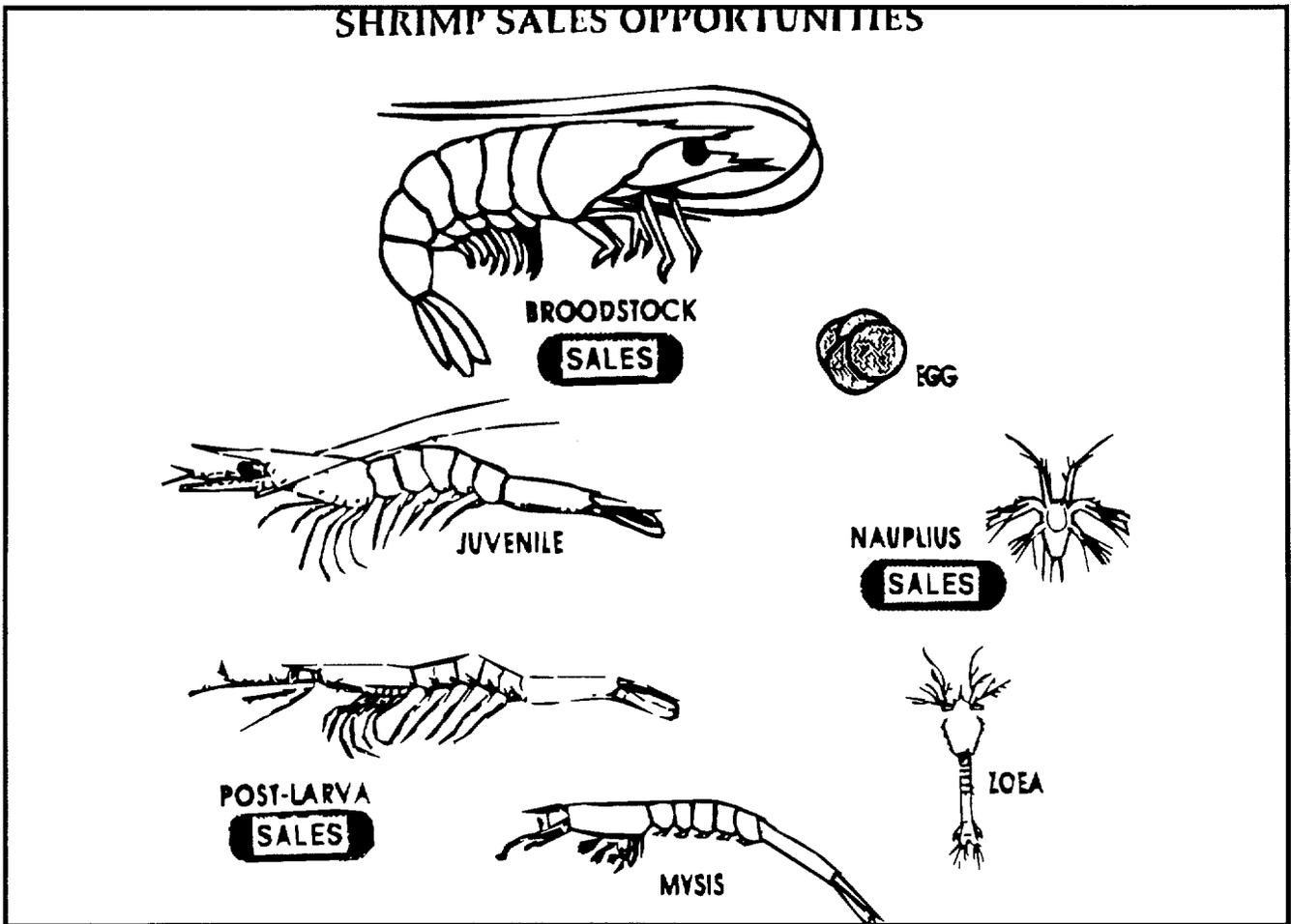


Figure 5

## 'Thailand could become flower-trade hub'

APISAK DHANASETTAKORN  
The Nation

AN AMERICAN agricultural consulting firm has identified orchid and rose farming in Thailand as holding potential for joint ventures between Thai and American investors.

In a comprehensive study on agricultural potential in Thailand, the American Society of Agricultural Consultants International has suggested that Thailand could become the regional centre for flower trade in Southeast Asia.

The study, funded by the US Agency for International Development (Usaid), is part of the agency's

new policy to promote the private sector in its assistance programmes.

Although the Bush Administration announced a freeze on development and military assistance to Thailand following the military coup in February, projects launched before the event will continue to be sustained.

Deputy Agriculture Minister Ajva Taulananda told reporters after a meeting with the US consulting firm's executives led by Michael Peden, its vice president, that flower plantations, bee farming and shrimp farming offer promising areas of joint investment.

The study, which will shortly be submitted to the Usaid and the

Agriculture Ministry, recommends that a flower auction market should be established to promote Thailand as the regional centre, similar to Holland in Europe.

To facilitate such a move, the packaging and air cargo industry should be strengthened to allow efficient handling of the delicate product, the minister was told.

The consulting firm has also recommended that integrated bee farming should be promoted, so that production and marketing are linked.

The bee farming business in Thailand still lacks technology crucial to diversify the product line.

In shrimp farming, the firm

suggested that American counterparts would be able to supply the technology for producing breed stock.

Although Thailand ranks among the world's largest exporters of frozen shrimp, it is incapable of producing the breed stock.

The firm has also recommended a series of technology-based agribusinesses such as the production of high-protein animal feed ingredient from animal refuse, and the manufacturing of diapers with protein extracts from seaweed.

Ajva said he expected a trade and investment mission from the US with expertise in the respective fields, to arrive in Bangkok shortly.

*INVESTMENT #2: FRESH CUT ROSE  
PRODUCTION AND MARKETING*

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25	Summary	_____
25	Background	_____
27	Proposed Venture	_____
28	Market Potential	_____
28	Market Strategy & Distribution	_____
29	Competition	_____
29	Research & Development	_____
30	Equipment & Supplies	_____
30	Production & Operations	_____
31	Financial	_____
31	Organization & Management	_____
33	Risk	_____
34	Conclusion	_____

SUMMARY

Northern Rose Farm (NRF) is the proposed name for a new joint venture company to be formed between an existing commercial rose farm in Chang Mai and an outside investor. The farm will produce commercial cut roses under controlled atmosphere conditions. At least 300 square meters of greenhouse space will be added each year to house more than 30,000 plants.

BACKGROUND

Bangkok flower wholesalers have been the target markets. Test shipments were also made to some high value export markets in Japan, Hong Kong and other regional centers. In the early years, considerable effort was made to convince Bangkok wholesalers to accept more internationally known commercial varieties rather than older ornamental types. These efforts have now paid off, and domestic buyers fully accept NRF's flowers.

NRF will be one of the first controlled atmosphere commercial greenhouse operations in northern Thailand. This will allow at least 200 percent greater annual productivity per square meter than existing farms. The operation will be based on introductions of high quality imported root stock with proven world market acceptability. These key production elements of the venture will increase average quality to more than 60 percent Grade A production and increase average price per stem by 100 percent. The greater output of high quality stems will justify a direct marketing approach using a special NRF brand.

The son of the present owner of the farm will be managing director and responsible for all operations. This individual has been operating the farm using outdoor production methods for the past four years.

The joint venture partner from the U.S. will contribute \$25,000 in high quality root stock of improved rose varieties and initial working capital. Technical management, experience and training will be provided by the U.S. partner. Capital in the form of \$40,000 worth of operating equipment will be provided by the local investor/farmer.

The operation shows good profitability over the first five years. A positive cash flow is generated in the first year and will grow steadily as the business expands. An internal rate-of-return of 32 percent is projected.

Northern Rose Farm (NRF) is situated on 14 acres of good soil types in Chiang Mai province at about 400 meters elevation. The property is family held and has traditionally been a rice and upland crops farm. About four years ago, one of the family members became interested in flower production through an association with an Australian rose producer.

A limited partnership was formed and approximately \$40,000 was invested in a commercial rose production operation on a portion of the family acreage. Some tropical flowers were also produced.

In the past, the farm's managers have experienced production and other problems. A virus outbreak in 1989-90 destroyed nearly all the plants, and the operation is now back to earlier production levels. The production difficulties and a lack of capital forced the Australian investor to withdraw. The Thai owners have persisted, however, and are rebuilding the operation with greater insights of the business.

Table 6

INVESTOR # 1 (LOCAL)	INVESTOR # 2 (USA)
Land	Capital
Production and Marketing Management	Genetic and Management Technology
Equipment currently in use	Access to World Markets

The rose varieties now being grown would be considered old fashioned and not acceptable in most world markets. However, root stock of these varieties is easily available without royalty payments. The current varieties are only acceptable in the Bangkok market. Much of the current production is done outdoors rather than in enclosed greenhouses. While this open field approach reduces costs and uses proven technology, there are additional production and market risks that make the farm vulnerable to more problems and limit its productive and economic potential.

PROPOSED VENTURE

This plan outlines the potential for a new joint venture company to be formed with the present manager holding 60 percent of the shares and an outside investor holding 40 percent. Contributions to the venture by each party is shown in Table 6.

The goal of the venture is to be Thailand's top quality supplier of commercial roses for Bangkok and Asian regional markets. Specific objectives include:

- Introduce high quality root stock through importation of internationally acceptable varieties each year to boost yields from 28 to 32 stems per plant and improve market acceptability.
- Establish at least 300 square meters of plastic covered greenhouses each year for five years to provide a controlled atmosphere environment and achieve 200 percent greater productivity per unit area than present levels.
- Develop a more intensive management system to reduce production risks, increase quality, and provide higher returns per acre than the present open field production.
- Increase output of Grade A stems from an average of 20 percent of the annual crop to 60 percent.
- Develop better transportation methods and more direct marketing systems to lengthen average shelf life from 4 days to 7 days and increase average returns to \$.28 per stem.

This plan shows the venture based on a beginning small scale commercial rose production operation. Long range expansion of greenhouses of up to 12 acres or more which offers significant potential for expansion. Additionally, in the near term, other varieties of tropical flowers and foliage could be integrated into the farm by utilizing an outdoor production system. This offers an opportunity to diversify the range of products, spread market risk, and take advantage of available land and productive resources.

**MARKET POTENTIAL**

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Thais are very flower conscious people and are producing and consuming greater quantities of cut flowers. Thailand exports more than \$25 million of cut flowers and foliage into world markets. Most of these exports are orchids destined for markets in Japan, Europe, the US, and Asian regional markets. A rapidly expanding domestic economy and increased tourism in recent years is increasing the demand for imported flowers to more than \$1 million annually.

These figures highlight Thailand's growing importance in world flower markets and the bright prospects for this venture. The opportunities are excellent for the venture to substitute high quality Thai-produced roses for imported varieties, as well as export to Asian regional markets, particularly to Hong Kong and Singapore.

**MARKETING STRATEGY AND DISTRIBUTION CHANNELS**

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The initial target markets for the operation are wholesalers in Bangkok. Additional markets will later be developed through direct sales to other high quality outlets in Bangkok such as hotels, hospitals, and florists. Export sales will be developed only when sufficient stocks of high quality roses are produced and prices offset the ease of marketing in Bangkok.

The Bangkok market accepts roses of three grades and offers three price levels to growers (see Table 7 for rose grades and prices).

Table 7

GRADE	PRICE
Grade A	\$.32 per stem
Grade B	\$.20 per stem
Grade C	\$.12 per stem

According to government and trade sources, northern Thai rose growers are now supplying only about 20 percent of their production for both A and B Grades. The remaining 60 percent is C Grade, mainly because of inferior varieties, poor production management, and inadequate atmospheric and quality control systems.

Grade "A" roses generally are sold to consumers through florist shops, hotels, and other market outlets demanding quality. Grades "B" and "C" are usually distributed through Bangkok wholesalers or the central market at Pak Klong Talad.

Producers sell their products by phone to wholesalers in Bangkok and are paid on a delivered basis to the Chiang Mai airport or railroad station. Few producers have direct access to end market outlets or consumers under this system. Thus, they have few opportunities to obtain higher margins, get market feedback, and then choose varieties that are more market acceptable.

Management believes they can achieve 50 percent or more grade "A" when the controlled atmosphere operation reaches full production. Once a high consistent level of quality can be achieved, there are excellent opportunities for NRF to capture larger margins through branded marketing and more direct sales.

NRF has recently established its own branded packing materials and has been successful in selling some shipments direct to hotels and florists in Bangkok. A trial export shipment was also successful.

### COMPETITION

Of the approximately 60 or more rose growers in the north, only one other has established a greenhouse operation. No other farms in the northern region are taking the direct marketing approach, but there appears to be ample room in the market for more producers of quality roses which could market their products directly or through existing channels.

### RESEARCH AND DEVELOPMENT

Introduction of new rose plant varieties is essential to the long range success of the venture. Introducing new stock will keep the farm current with market demands and ahead of production problems associated with older varieties. Initially, new varieties that are not subject to international royalties will be introduced. As the venture becomes more profitable and develops international markets, newer varieties that command royalties can be introduced.

There are also opportunities for developing other products and ventures.

These include:

- Production and sale of new rose varieties
- Development of tropical flowers for sale domestically and for export
- Production of bulbs for sale locally
- Production and sale of seeded field crop flowers
- Sales of greens and other foliage used in flower arrangements

The main obstacle to development of these new products is the technical and management capability of the current team. These opportunities cannot be developed until a sufficient market position in roses is established given the existing market and economic potential for roses. As the capabilities for diversifying into these new enterprises are developed, there will be a need for additional research on adaptable varieties and suitable management systems.

#### EQUIPMENT AND SUPPLIES

The venture will be developed on a leased land area of 1500 square meters of a 14 acre property owned by the manager and his family.

Access to the property is currently adequate, but improvements will be made to the road in the first year. Materials and labor for greenhouse construction are available locally. Projected costs of materials and construction of \$4.00 per square meter are very reasonable. Other materials and equipment for production such as irrigation system components, tillage machines, chemicals, fertilizer, and other supplies are available in Chiang Mai or local shops.

Existing equipment will be purchased by the joint venture from the present manager and the previous partnership. The operation has an existing packing shed and cooler for flower packing and storage.

The shed is located on the main road leading to the farm and could be developed as a roadside stall. A pickup truck that was purchased for the previous venture is currently used for obtaining supplies and transporting flowers to the packing shed and to Chiang Mai for air and rail shipment to Bangkok.

#### PRODUCTION AND OPERATIONS

Rose production in the north typically follows seasonal production and marketing patterns (see Table 9, Production Seasons).

Table 8

## PRODUCTION SEASONS

MONTH	ACTION
April	Planting of new rootstock; limited cutting and poor marketing; poor growing conditions due to the heat
May	New plant growth; limited cutting and marketing; poor growing conditions due to heat
June-October	Cuttings from new plants; regular cutting and marketing; restricted growing conditions due to heavy rain and clouds
November	All plants pinched back to increase flowers for Valentines sale; ideal growing conditions (cool and dry)
December-January	Limited production due to pinch; Ideal growing conditions
February	Peak production and market demand; good growing conditions
March	Sharp cutback in production following pinch crop; poor growing conditions due to hot weather

Managing these seasonal operations can adequately be carried out by the manager and local hired labor. All of these individuals have had experience with the previous venture. They will require more technical training to adequately manager a quality greenhouse operation, however. This training is expected to be supplied by the joint venture partner.

#### FINANCIAL *Performance*

An initial capital base of \$65,000 is needed for startup. About \$40,000 in existing assets appraised at fair market value will be supplied by the present manager. These assets include a pickup, irrigation system, packing shed, cool store room, and other basic production items. An additional \$25,000 will be supplied in high quality root stock and working capital by the foreign partner. New root stock valued at \$14,400 will be added in each of the first five years of operation.

Net income after taxes is \$8,000 in the first year and climbs steadily to \$42,000 by the end of the fifth year. (see Table 9, Income Statement; Table 10, Balance Sheet; and Table 11, Internal Rate of Return)

#### ORGANIZATION AND MANAGEMENT

Management responsibility of the venture will be assumed by the present manager of the property. This individual has grown up on the farm and has developed the existing operation. He is about 30 years old and has a diploma in agribusiness management. Prior to starting the present operation, he supplied hybrid field crop seeds and contracted production with growers in northern Thailand.

If a foreign investor does not come forward, the present manager expects to develop the property with available resources.

Table 9

INCOME STATEMENT					
Annual Growth Rate	100.00 percent	50.00 percent	25.00 percent	13.00 percent	10.00 percent
Sales	Year 1	Year 2	Year 3	Year 4	Year 5
Roses - Fresh Cut	\$48,827	\$97,654	\$146,481	\$183,102	\$206,905
percent of Total Sales	100 percent	100 percent	100 percent	100 percent	100 percent
Cost of Sales					
percent of Total Sales	4 percent	4 percent	4 percent	4 percent	4 percent
Labor	\$8,880	\$17,760	\$26,640	\$33,300	\$37,629
percent of Total Sales	18 percent	18 percent	18 percent	18 percent	18 percent
Overhead	\$0	\$0	\$0	\$0	\$0
percent of Total Sales	0 percent	0 percent	0 percent	0 percent	0 percent
Total Cost of Sales	\$10,596	\$21,192	\$31,788	\$39,735	\$44,901
Gross Profit	\$38,231	\$76,462	\$114,693	\$143,367	\$162,004
Gross Margin	78 percent	78 percent	78 percent	78 percent	78 percent
Operating Expenses					
Selling Costs	\$9,744	\$19,488	\$29,232	\$36,540	\$41,290
Percent of Total Sales	20 percent	20 percent	20 percent	20 percent	20 percent
Research & Development		\$960	\$1,920	\$2,880	\$3,600
percent of Total Sales	2 percent	2 percent	2 percent	2 percent	2 percent
General & Administrative	\$12,720	\$25,440	\$38,160	\$47,700	\$53,901
percent of Total Sales	26 percent	26 percent	26 percent	26 percent	26 percent
Total Operating Expenses	\$23,424	\$46,848	\$70,272	\$87,840	\$99,259
percent of Total Sales	48 percent	48 percent	48 percent	48 percent	48 percent
Income from Operations	\$14,807	\$29,614	\$44,421	\$55,527	\$62,745
percent of Total Sales	30 percent	30 percent	30 percent	30 percent	30 percent
Interest Income	\$0	\$0	\$0	\$0	\$0
Interest Expense	\$0	\$0	\$0	\$0	\$0
Income before Taxes	\$14,807	\$29,614	\$44,421	\$55,527	\$62,745
Taxes on Income	\$6,799	\$9,773	\$14,659	\$18,324	\$20,706
Net Income After Taxes	\$8,008	\$19,842	\$29,762	\$37,203	\$42,039
Percent of Total Sales	16 percent	20 percent	20 percent	20 percent	20 percent

One of the Bangkok wholesalers has approached him to invest in the operation, but this may limit the market opportunities and is a less attractive possibility.

Local labor for operations is presently used and will be retained by the venture. Several of the staff have been with the farm since it was established and will form the nucleus of the new operation.

An assistant manager will be promoted from the current staff in the second year of operations. Additional labor for operations will be hired as needed as production expands.

The joint venture partner is expected to provide additional technical and training support.

Table 10

BALANCE SHEET					
	Year 1	Year 2	Year 3	Year 4	Year 5
<b>CURRENT ASSETS</b>					
Cash	\$83,609	\$167,218	\$250,827	\$313,534	\$354,293
Investments	\$0	\$0	\$0	\$0	\$0
Accounts Receivable	\$0	\$0	\$0	\$0	\$0
Notes Receivable	\$0	\$0	\$0	\$0	\$0
Inventory	\$0	\$0	\$0	\$0	\$0
<b>Total Current Assets</b>	<b>\$83,609</b>	<b>\$167,218</b>	<b>\$250,827</b>	<b>\$313,534</b>	<b>\$354,293</b>
<b>PLANT AND EQUIPMENT</b>					
Building	\$10,000	\$20,000	\$30,000	\$37,500	\$42,375
Office Equipment	\$0	\$0	\$0	\$0	\$0
Leasehold Improvements	\$14,400	\$14,400	\$14,400	\$14,400	\$14,400
Total Net Property & Equip	\$19,000	\$23,600	\$28,200	\$31,650	\$33,893
Other Assets	\$0	\$0	\$0	\$0	\$0
<b>Total Assets</b>	<b>\$102,609</b>	<b>\$205,218</b>	<b>\$307,827</b>	<b>\$384,784</b>	<b>\$434,806</b>
<b>LIABILITIES &amp; OWNER EQUITY</b>					
<b>Current Liabilities</b>					
Short Term Debt	\$0	\$0	\$0	\$0	\$0
Accounts Payable	\$3,322	\$6,643	\$9,965	\$12,456	\$14,075
Income Taxes Payable	\$6,799	\$13,599	\$20,398	\$25,497	\$28,812
Accrued Liabilities	\$0	\$0	\$0	\$0	\$0
<b>Total Current Liabilities</b>	<b>\$10,121</b>	<b>\$20,242</b>	<b>\$30,363</b>	<b>\$37,953</b>	<b>\$42,887</b>
Long Term Debt	\$0	\$0	\$0	\$0	\$0
<b>Total Liabilities</b>	<b>\$10,121</b>	<b>\$20,242</b>	<b>\$30,363</b>	<b>\$37,953</b>	<b>\$42,887</b>
<b>OWNER/STOCKHOLDER EQUITY</b>					
Common Stock	\$65,000	\$65,000	\$65,000	\$65,000	\$65,000
Retained Earnings	\$8,008	\$19,842	\$29,762	\$37,203	\$42,039
<b>Total Equity</b>	<b>\$73,008</b>	<b>\$84,842</b>	<b>\$94,762</b>	<b>\$102,203</b>	<b>\$107,039</b>
<b>Total Liabilities &amp; Equity</b>	<b>\$83,129</b>	<b>\$105,083</b>	<b>\$125,125</b>	<b>\$140,156</b>	<b>\$149,927</b>

This will be in the form of on-site technicians from abroad or travel by key managers to U.S. production locations for training and management experience. Marketing and financial guidance will be provided in the course of regular visits to the project.

Additional technical and research support will be sought by retaining a local university professor or specialist. This person will assist in evaluation of new varieties and technical assistance.

Marketing and administrative support will be the responsibility of the manager. Due to the low volumes of production in the early years, these operations should be easily handled by the manager and one secretary-bookkeeper.

#### RISK

The primary production risks are associated with damage to the flowers due to climatic, insect, disease, and other pest problems.

Table 11

INTERNAL RATE OF RETURN						
INVESTMENT	65,000					
INCOME TAX RATE	33 percent					
INTERNAL RATE OF RETURN	31.60 percent					
GROSS TAXABLE INCOME						
YEAR	Savings	Dep.	After Tax Savings	Taxes	Savings	Flow
1	14,807	5,400	9,407	3,104	6,303	11,703
2	29,614	10,800	18,814	6,209	12,605	23,405
3	44,421	16,200	28,221	9,313	18,908	35,108
4	55,527	20,250	35,277	11,641	23,636	43,886
5	62,745	22,883	39,862	13,154	26,708	49,591

These are very significant constraints to expanding the present open production system and have severely reduced the farm's productivity in the past. With the introduction of atmospheric control greenhouse systems and improved root stock, these problems should be much easier to manage. The key to reducing production risks under the new system will thus be the management capability of the staff.

Marketing risks are greatly reduced under the present system of selling flowers to Bangkok wholesalers on a "delivered Chiang Mai" basis. These risks are further reduced by having cool storage on the farm to hold flowers until transfer to Chiang Mai.

Introducing direct branded marketing of roses to florists, hotels, and other Bangkok outlets will bring added marketing risks.

By direct selling on a "delivered Bangkok" basis (either to shops or C&F Bangkok airport) the farm assumes more risk in damage to the product and non-acceptability by the buyer. While the increased risks are significant, they are not unmanageable. Sales can be made on a shipment-to-shipment basis at the discretion of the farm manager. As quality of the flowers and the company's risk management capability improves, more direct marketing can be undertaken. Developing closer working relationships with the Bangkok and export buyers will be a key element in risk management.

#### CONCLUSION

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This new venture offers excellent opportunities for both parties, as well as Thailand's commercial rose industry.

Current management will provide much of the production, marketing, and management needs which are crucial to making a commercial rose farm successful.

Moreover, they see the need for greater investment in their operation in order to keep pace with market needs and take advantage of the potential offered in domestic and export markets.

39	<u>Summary</u>
39	<u>Background</u>
42	<u>Proposed Venture</u>
43	<u>Specific Opportunities</u>
43	<u>Analysis of Investment</u>
44	<u>Anaerobic Waste Management System</u>
46	<u>Anaerobic Digester Products</u>
48	<u>Establishing Biofeed Price and Projecting Revenues</u>
49	<u>Market and Marketing</u>
53	<u>Potential Business Arrangements</u>

## SUMMARY

An animal waste biofeed business is an investment opportunity in an operation that will use animal manures to produce energy and ingredients to be used in the formulation of feeds for the extensive shrimp farming industry in Thailand and surrounding locations in Southeast Asia.

The specific business proposed will utilize ingredients that can be used in the formulation of shrimp feed, utilizing organic wastes produced on one or more large pig and chicken farms in Thailand. Shrimp feed ingredients were chosen because of the unique characteristics of the material produced and the significant economic advantage of using this material to produce shrimp as contrasted with pork, chicken, or other lower valued meat products.

## BACKGROUND

When manure or other organic wastes are processed using anaerobic digestion technology, they are converted from problems to resources. Operating organic waste treatment facilities in conjunction with the production of chickens, pigs or other producers of large amounts of organic waste can result in a net economic gain and convert a potential environmental problem into an asset.

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Pg 3 - 36 - 38

If manure or other organic material is put into a tank which is oxygen free, the bacteria present in the manure will break down the fats, carbohydrates, and proteins that were not consumed by the animal. This will produce a cellular material which is rich in protein and other nutrients and "biogas." (This is a combination of methane, carbon dioxide, and trace gases that are produced when organic materials decompose in the absence of oxygen.) Natural gas is approximately 95 percent methane, while unrefined biogas contains only 50 to 70 percent methane and 30-50 percent carbon dioxide.

Methane, the combustible portion of the gas, can be used for heating, cooking or powering generators to produce electricity. The residual carbon dioxide can be used as a source of carbon for cultivation of algae. The diagram in Figure illustrates the "Anaerobic Conversion Process" showing the products of value that can be produced from wastes.

During anaerobic treatment most of the pathogens in the waste are destroyed, while the valuable nitrogen, phosphorous, potassium and minerals are bound into the bacterial cells that are accomplishing the breakdown process. When the digestion is completed, the remaining cellular material is virtually odorless and non-polluting.

This cellular material or "biomass", as it is often described, can be used as an ingredient to formulate feeds for shrimp, fish, chickens and other animals or as an organic fertilizer for crops. (see Figure 6 for diagram of an Algae Culture System)

Use as a feed ingredient is dependent on the content of protein, fatty acids, vitamins and minerals in the final product. The biomass generated from the anaerobic digestion of pig or chicken manure generally has a composition required for a feed ingredient and is referred to as "biofeed" in this discussion.

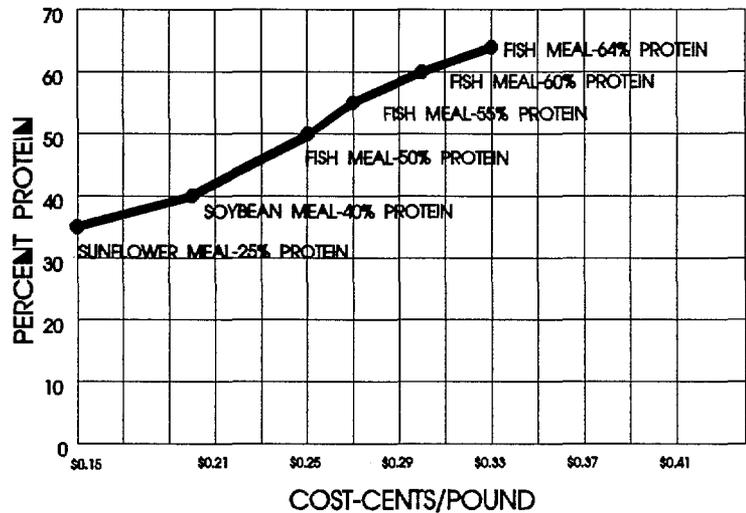
Activities that produce these commodities from indigenous resources, or from wastes resulting from a developing agro-industry, have the combined benefits of import substitution, production cost reduction, and elimination of pollution and health hazards.

Opportunities for utilization of organic wastes as a source of material for shrimp feed production will depend on establishing appropriately designed waste management facilities in conjunction with the production of pigs, chickens, eggs or any other industries that produce significant amounts of organic waste. (Converting animal wastes into valuable products can have a significant impact on the economics of the farm and the performance of benefiting industries.)



Figure 7

## FEED INGREDIENTS PROTEIN vs PRICE



### PROPOSED VENTURE

#### SHRIMP FEED

The growth of shrimp farming in Thailand has been dramatic. In 1988 production was 55,000 metric tons, a 320 percent increase over the previous year. Production in 1989 jumped to more than 100,000 metric tons. Thailand is now the second largest producer of shrimp in the world and the world's largest producer of Tiger Prawns. There are now more than 4,000 shrimp farms in Thailand. With an estimated 600 km of coastal land suitable for aquaculture, there is great potential for expansion of this industry.

The shrimp farming industry is dependent on two primary external inputs to maintain current levels of production. These are shrimp post larvae, (seed) and shrimp feed. If the industry is to remain productive and expand, a reliable supply of these vital elements at a competitive price is essential.

Marine shrimp or "prawns", as they are referred to in Thailand, command a substantially higher price than chicken or pork in the market. Shrimp are very efficient converters of feed to tissue.

Feed conversion on shrimp farms averages about two kilos of dry feed to produce one kilo of live prawns produced. At present the shrimp farming industry requires more than 200,000 metric tons of feed annually. Shrimp feeds now being produced are formulated from imported fishmeal, soybean meal, squid meal and other very expensive commodities.

The "biofeed" produced in the anaerobic digester from waste material may be substituted for about 30 percent of the ingredients now used in the formulation of shrimp feed. The potential to displace upwards of 60,000 metric tons of imported ingredients annually with locally produced ingredients presents a very promising opportunity. (see Figure 7, Feed Ingredients)

## SPECIFIC WASTE UTILIZATION OPPORTUNITIES

Opportunities for developing anaerobic digestion systems to produce feed and energy are linked directly to locations where there are sufficient amounts of waste in one place to justify the construction of an anaerobic processing facility. The evaluation conducted by the ASACI team identified numerous broiler and pig production facilities in Thailand with sufficient wastes to justify the construction of processing units. Of particular interest was a combination swine and egg farm in the Chiang Mai area.

This fully integrated facility consists of a 1,200 sow breeder operation, producing 21,000 pigs per year and a 25,000 hen layer operation producing about 685,000 eggs per year. The farm is now expanding its brood herd to 3,000 sows with the capacity to produce almost 57,500 market pigs annually. This farm has its own feed mill located on the property and produces sufficient feed to meet the needs of the farm and has substantial capacity for expansion.

The project described here focuses on the opportunity to establish a joint venture with the present farming operation to process wastes from this facility into feed ingredients and methane.

The farm is as up-to-date and modern as the best facilities located anywhere in the world. The owners of the farm have expressed interest in participating in a joint venture.

## ANALYSIS OF INVESTMENT AND PERFORMANCE

This analysis centers on the development of facilities required and the costs incurred to utilize the wastes produced at the Chiang Mai farm. The amounts of processed shrimp feed ingredient or "biofeed" is determined based on the characteristics of the wastes generated by the types of chickens and pigs at this facility. The biogas generated and used to produce electricity is also calculated. The profit potential of the venture is determined by comparing the costs of production with the value of the products produced.

The design and sizing of the units in the waste treatment system is based on the number of animals per day in each of the units, weight of animals, projected manure output, and total water usage within each facility.

Table 12

PIG FARM POPULATION CHARACTERISTICS	
Sows in Brood Herd	3,000
Litters/ Sow/Year	2.2
Pigs Born Alive/ Litter	10
Weaning Average/Sow	8.7
Market Pigs/Sow/Year	19.14
Market Pigs/Year	57,420
Market Weight (pounds)	210

The amount and composition of the manure from the different types of livestock is well defined. A sample of the characteristics of animal wastes is shown in Tables 12 and 13.

The waste digester unit in the system consists of two tanks aligned in tandem. Most of the solid matter is broken down or digested in the first tank. The solubilized material is converted to methane in the second tank.

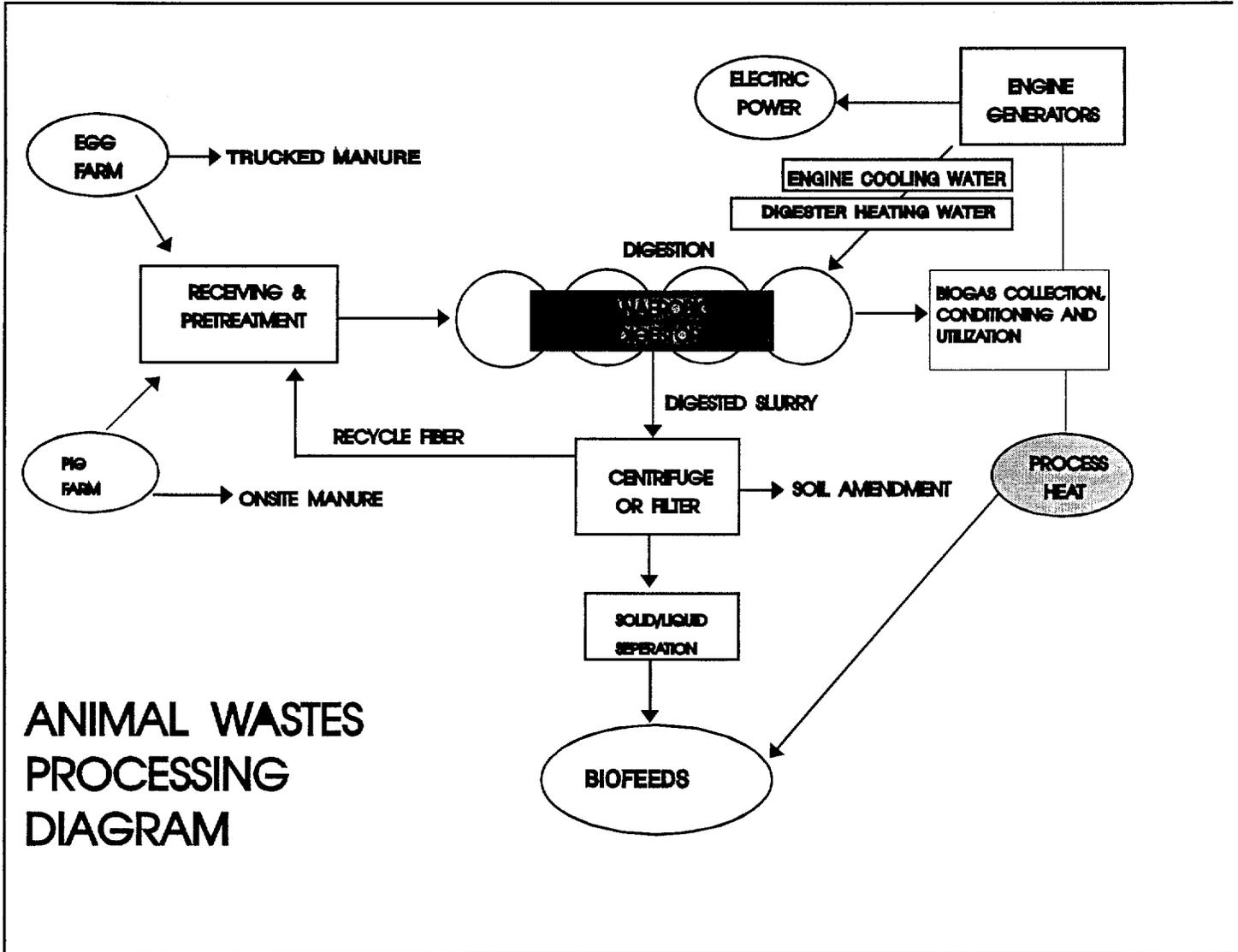
**THE ANAEROBIC WASTE MANAGEMENT SYSTEM**

The types of highly efficient animal waste management facilities established in other locations are totally appropriate to the situation in Thailand. (where the swine and egg production facilities are as technically advanced as any location producing similar products in the world today.)

Table 13

CHARACTERISTICS OF THE WASTES PRODUCED					
Average Wgt percent	Animals Lbs Manure	Percent Population	Animal Number	Lbs. Manure Animal/day	Wet Wgt Manure
<b>BREEDERS</b>					
OPEN	500	17.00%	540	12.5	6,750
PREGNANT	550	56.00%	1680	14.96	25,133
LACTATING	535	18.00%	540	32.1	17,334
BOARS	600	6.00%	210	14.7	3,087
<b>PRODUCTION ANIMALS</b>					
PRE-WEAN	8	16.50%	9,474	0.89	8,432
NURSERY	26	16.50%	9,474	2.81	26,623
STARTERS	60	16.50%	9,474	4.8	45,477
GROWERS	110	16.50%	9,474	7.7	72,952
FINISHERS	162	16.50%	9,474	9.75	92,374
MARKET	198	16.50%	9,474	9.88	93,606

Figure 8



Overflow and step-down tank design allows for water run off. A floating cover allows for mixing of the solids by the methane produced as the methane rises to the surface. A retention pond containing water hyacinths is used to recapture residual nutrients.

The hyacinths can be macerated and returned to the digester system to enhance methane production in the system.

A schematic representation of the system design is shown in Figure 8.

The size of the proposed system and its costs are based on this design. The number of subunits of each part of the system is specified based on the amount of manure to be reprocessed.

The anaerobic digester units have a volume of 3,000 gallons. A 3,000 sow farm will require 21 digester units to process the 179 metric tons of manure produced on the site daily.

**Capital Expenditures:** The waste processing facility is designed with a capacity to process more than 200 tons of manure per day. This is sufficient capacity to process the combined wastes from the swine operation and the egg farm at the Chiang Mai location. The capital costs of the facilities are approximately \$4.25 million. Start up capital represents an additional \$150,000.

The projected revenues are based on sales of biofeed produced for sale to manufacturers of shrimp feeds. The concept of using the biomass from the anaerobic system has been discussed with shrimp farmers and feed producers in Thailand and has received enthusiastic support.

Projected revenues also include the value of the electrical energy (KWH) produced by burning captured methane in an engine generator.

#### ANAEROBIC DIGESTOR PRODUCTS

The output of digester products can be determined by the amount of manure produced daily by the pig and egg units.

The primary products are biofeed ingredient and methane. The anaerobic digestion of manure from the 3,000 sow farm is estimated to produce 2,082 metric tons (M.T.) of Biofeed and 95 million cubic feet of biogas per year.

**Biofeed:** Previously completed technical studies were used to estimate the protein, fat, carbohydrate, vitamin and mineral content of the products of digestion. This information, primarily the Nitrogen (N), Phosphorus (P) and Potassium (K) content of the biomass, is used to determine the value of this material as a feed ingredient.

Table 14

DAILY PRODUCTION IN ANAEROBIC SYSTEM			
PRODUCTS	PIGS	LAYERS	TOTAL
Total Solids(lbs)	40,648	2,205	42,853
Volatile Solids( percentTS)	88 %t	73 %	
Total V. S.(lbs)	34,561	1,610	36,171
Conversion eff.( percent converted	60 %	60 %	
V.S. Converted(lbs)	20,737	966	
BIOGAS PROD.c.f. (@12 cu.ft	248,838	11,589	260,428
BTU/cf Biogas	600	600	
BTU/day(1,000)	149,303	6,954	156,257
Therms(100,000BTU)/day	1,493	70	1,563
KWH/day(@13,000 BTU/KWH)	11,485	535	12,020
ELECTRICITY-KW	479	22.29	501
Methane in Biogas percent	60 %	60 %	
Methane Produced (c.f./da)	149,303	6,954	156,257
CO2 (c.f. /day)	99,535	4,636	104,171
DRY SOLIDS-65 percent of suspended	10,818	634	11,452
WET PASTE@ 20 percent dry wgt.(lbs	54,089	3,170	57,260
FEED INGREDIENT(10 percent moist.l	12,020	705	12,724
NPK Content of Waste			
Total Nitrogen in Waste (lb )	1,777	94	1,871
Total Phosphorus in Waste (	685	61	746
Total Potassium in Waste (l	984	66	1,050
NPK Content of Dry BIOFEED			
Nitrogen Captured percent	53 %	53%	
Nitrogen in Biomass(lbs)	942	50	991
Phosphorus Captured percent	83 %	83%	
Phosphorous in Biomass (lb	567	50	617
Potassium Captured percent	26 %	26%	
Potassium in Biomass (lbs)	254	17	271
FINAL NPK RATIO OF DRY BIOFEED			
NITROGEN	8 %		
PHOSPHORUS	5%		
POTASSIUM	2%		
PROTEIN CONTENT (=N*6.25)	49%		

The final N:P:K ratio determines the potential use of the biomass produced in the anaerobic system. Anaerobic treatment of pig manure using this technology produces a product containing approximately 8 percent N, 5 percent P and 2 percent K.

The Nitrogen content is used to estimate the amount of protein in the biomass. Material with 8 percent nitrogen has a protein content of 50 percent. The quality of the material produced from the swine and poultry waste supports its use as an animal feed ingredient. Technical details on the kind and amounts of the various products produced in the digestion system are shown in Table 14, Daily Production In Anaerobic System.

#### ESTABLISHING A BIOFEED PRICE AND PROJECTING REVENUES

**Value of Biofeed Produced:** In order to calculate the value of the material produced as a feed ingredient replacement in Thailand, the delivered costs of ingredient materials for which the biofeed might be substituted were determined. Figure 7 shows the current costs of ingredients according to protein content. Biofeed containing 50 percent protein also contains valuable fatty acids, vitamins, minerals and trace elements which contribute to its value; however, only the protein content was considered in estimating the value of the material.

Based on a protein content of 50 percent a price of 25 cents per pound, or \$550 per metric ton, was determined.

Production of 2,082 M.T. of biofeed annually will generate revenues of \$1.08 million. Biofeed material containing 49 percent protein could command a price of 25 cents per pound (see Table 14).

**Slaughter Operations:** The Thai partner is currently constructing a slaughter house for the swine operation. The quality of the biomass as an ingredient for shrimp feed is improved when slaughter wastes are added to the anaerobic digester.

**Electricity:** Biogas produced in this system contains about 60 percent methane. Biogas produces about 600 BTU of energy per cubic foot of gas burned. Based on a daily production of 260,000 cubic feet of biogas used to operate a gas powered generator, approximately 12,000 kwh of electricity can be produced daily in a biogas generator fueled by this system.

Details of electrical production are shown in the Table 14. Generally the electrical energy produced on site can be used to reduce or replace power now purchased to support the operation.

The system proposed for this site has the capacity to produce 2.2 million kwh of electrical energy per year. At present the farm purchases all of the electricity it requires at a cost of 5.5 cents per kwh. Electricity produced on-site has the potential to offset \$125,000 in electrical expenses annually.

#### MARKET AND MARKETING

The 1990 production of 100,000 metric tons requires more than 210,000 metric tons of shrimp feed valued at more than \$210 million. Assuming that the biofeed is substituted for only 10 percent of the ingredients in shrimp feed, the potential market in Thailand would be about 20,000 M.T. per year.

Production from the proposed Chaing Mai farm would be 2,000 M.T. per year or only 10 percent of the potential market. Shrimp farming is now developing in Vietnam and Cambodia. This creates the potential to expand the feed ingredient business to almost any animal production facility of suitable size to meet the expanding market for shrimp feed ingredients in the region.

To date the use of this material in shrimp feed has only been demonstrated on an experimental basis. In order to successfully market the biofeed material, it will be necessary to prove its performance under commercial production conditions on shrimp farms in Thailand.

It is envisioned that a pilot plant capable of producing sufficient shrimp feed to supply production ponds on more than one farm would be implemented prior to the development of the full scale commercial biofeed operation. The proposed business would be preceded by a demonstration phase. This approach has been discussed with several commercial shrimp producers. They have indicated an interest in both evaluating the feed performance and participating in the development of the business.

#### FINANCIAL

The financial performance of the business is based on the amount of the two primary products produced and the costs associated with producing these products. The evaluation presented is based on the combined waste output of a 3,000 sow pig farm and a 25,000 hen egg farm. In this evaluation a period of nine months was devoted to construction and startup with the first product available for sale in the first month of the second year.

Table 15

SALES PROJECTIONS					
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
<b>PRODUCTION CALCULATIONS:</b>					
Number Digestors Operating	0	21	21	21	21
<b>AMOUNTS of PRODUCTS: AMOUNT</b>					
Methane (therms) produce	0	562,524	562,524	562,524	562,524
Electricity (Kwh)	0	2,274,061	2,274,061	2,274,061	2,274,061
"BIOFEED" (metric.tons)	0	2,082	2,082	2,082	2,2082
<b>PRODUCT REVENUES VALUE</b>					
Methane (Therms) Sold	0	0	0	0	0
Electricity (\$.055/kwh)	125,073	125,073	125,073	125,073	125,073
"BIOFEED" (\$520/ton)	1,082,731	1,082,731	1,082,731	1,082,731	1,082,731
<b>TOTAL REVENUES (dollars)</b>	0	1,207,824	1,207,831	1,207,831	1,207,831

The projections of amounts and value of biofeed and electricity produced are shown in Table 18, Sales Projections.

Table 16

CAPITAL COSTS					
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
<b>CONSTRUCTION COSTS:</b>					
Site Prep Infrared	66,000	0	0	0	0
Main Building	127,974	0	0	0	0
Pretreatment	508,614	0	0	0	0
Digestors	1,226,083	0	0	0	0
Biogas	87,550	0	0	0	0
Bio Solids Collect	659,390	0	0	0	0
BIOFEEDS	412,672	0	0	0	0
Electrical & Plumbing	280,988	0	0	0	0
Vehicles	95,000	14,250	38,000	28,000	0
Tools Equipment	20,000	48,000	4,200	0	0
<b>TOTAL CONSTRUCTION COST</b>	3,484,271	62,250	42,200	28,000	83,000
<b>FURNITURE / EQUIPMENT</b>					
Office	61,691	1,000	1,000	1,000	1,000
Utilities	0	0	0	0	0,
Laboratory	102,449	1,000	1,000	1,000	1,000
<b>TOTAL FURN \ EQUIPMENT</b>	164,140	2,000	2,000	2,000	2,000
<b>LEGAL &amp; TECHNICAL COSTS:</b>					
Project Mgr..	100,000	100,000	0	0	0
Technical Fees	240,000	260,000	0	0	0
Admin/Legal Fees	4,000	4,000	1,000	1,000	1,000
Start-up & Contingency	178,671	2,500	884	600	1,954
Survey Design/Engineering Design	178,162		0	0	0
<b>TOTAL LEGAL/TECHNICAL</b>	600,833	366,500	1,884	1,600	2,954
<b>TOTAL CAPITAL COSTS</b>	4,249,244	369,000	46,084	31,600	100,651
<b>CUMULATIVE COSTS:</b>	4,249,244	4,618,244	4,664,328	4,695,928	4,796,582

The projections of amounts and value of biofeed and electricity produced are shown in Table 15, Sale Projections.

**Capital Costs:** The total capital costs to develop the anaerobic treatment system for the manure and the facilities to process the cellular feed to biowaste in the first year are estimated at \$4.25 million. Approximately \$3.5 million are construction costs. The remainder of the capital costs include furniture, small equipment, legal and technical fees. (see details in Table 16)

**Income Statement:** The revenues identified from the business are from sales of biofeed and the value of the electricity contributed back to the operation of the farm. Other by-products are generated by this process, but the current conditions in Thailand do not support the sales of these material to any significant level.

Variable costs were principally in the categories of labor and electricity. Identifying electricity as both a revenue and cost item provided a convenient way of balancing the accounts. The other primary expenditures directed to production were in the categories of administrative and office costs. (see Table 17, Income Statement)

Most of these costs would not increase if the amount of wastes was doubled or tripled. In the present case, the annual profits are projected at about \$ 545,000 per year. The internal rate of return (IRR, as based on net income over the first ten years) is 9.17 percent for this operation. If more wastes are available, the profits and IRR would significantly improve.

The Balance Sheet (Table 18) identifies the assets, liabilities and the depreciation factors used in the evaluation of performance.

The Cash Flow Projections (see Table 19) show that the method of financing chosen for this evaluation was equity investment of the capital required.

The economic performance of this business is extremely sensitive the scale of the operation (see Figure 9, IRR vs. Farm Size). Considering the substantial capital required to develop the system, it was important to evaluate the performance of the business relative to the amount of waste processed per day. The capital investment for an operation processing a relatively small amount of waste does not produce an exciting return on investment or IRR. The only significant cost in expanding the capacity is the cost of adding more digestors and pretreatment units. By increasing the amount of time utilized daily, the amount of material processed can be expanded with little increase in cost.

Table 17

INCOME STATEMENT					
	YR 1	YR 2	YR 3	YR 4	YR 5
<b>TOTAL REVENUES</b>	0	1,207,824	1,207,831	1,207,831	1,207,831
<b>VARIABLE COSTS:</b>					
Direct Labor	34,094	85,125	85,125	85,125	85,125
Organic Wastes	0	0	0	0	0
Electrical	7,057	56,459	112,917	112,917	112,917
Water	0	(18)	(20)	(20)	(20)
Fuel	5,760	6,720	8,640	8,640	8,640
General Maintenance	3,800	8,000	8,000	8,000	8,000
Chemicals	0	0	0	0	0
Analytical Costs	18,000	36,000	36,000	36,000	36,000
<b>TOTAL VARIABLE COSTS:</b>	68,711	192,286	250,663	250,663	250,663
<b>VARIABLE EXPENSES:</b>					
Freight/Insurance	0	0	0	0	0
<b>TOTAL DIRECT COSTS:</b>	68,711	192,286	250,663	250,663	250,663
<b>GROSS PROFIT:</b>	(68,711)	1,015,538	957,168	957,168	957,168
<b>GEN. &amp; ADMIN.</b>					
Salaries	47,500	55,000	65,000	65,000	65,000
Consultants	2,000	2,000	2,000	2,000	2,000
Benefits @25 percent	11,875	13,750	16,250	16,250	16,250
Insurance	7,389	9,134	9,134	9,134	9,134
Land Lease	0	0	0	0	
Legal & Account	800	800	800	800	800
Office Supplies	800	800	800	800	800
Travel & Comm.	2,000	2,000	2,000	2,000	2,000
<b>TOTAL</b>	G & A	72,364	83,484	95,984	95,984
<b>OTHER FIXED COSTS:</b>					
Fixed Labor	6,250	6,250	6,250	6,250	6,250
Marketing	0	40,603	21,655	21,655	21,665
Depreciation	94,898	288,275	288,275	288,275	288,275
Interest Paid	0	0	0	0	
<b>TOTAL FIXED COSTS</b>	101,148	335,129	316,181	316,181	316,181
<b>TOTAL COSTS:</b>	242,223	610,899	662,827	662,827	662,827
<b>PRE TAX NET PROFIT</b>	(242,223)	596,926	545,004	545,004	545,004
<b>NET INCOME</b>	-4,396,569	454,451	787,195	801,679	732,625
<b>TAXES</b>	0	0	0	0	
<b>IRR</b>	9.17 percent				

Table 18

BALANCE SHEET					
	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
<b>ASSETS:</b>					
Cash	202,781	586,338	1,375,879	2,177,558	2,910,143
A/R (30 days)	0	100,653	100,653	100,653	100,653
Inventory	0	0	0	0	
Total Current Assets	202,781	686,991	1,476,532	2,278,211	3,010,836
Plant & equipment	4,274,244	4,690,744	4,736,828	4,768,428	4,869,082
Less Acc. Depreciation	94,898	383,174	671,449	959,724	1,248,000
Long-Term Assets	4,179,346	4,307,570	4,065,379	3,808,704	3,621,082
<b>TOTAL ASSETS</b>	<b>4,382,127</b>	<b>4,994,561</b>	<b>5,541,911</b>	<b>6,086,914</b>	<b>6,631,918</b>
<b>LIABILITIES:</b>					
Accounts Payable	24,350	39,859	42,204	42,204	42,204
Long-term Debt	0	0	0	0	0
<b>TOTAL LIABILITIES</b>	<b>24,350</b>	<b>39,859</b>	<b>42,204</b>	<b>42,204</b>	<b>42,204</b>
<b>EQUITY:</b>					
Paid in Capital	4,600,000	4,600,000	4,600,000	4,600,000	4,600,000
Retained Earnings(Loss)	(242,223)	354,703	899,706	1,444,710	1,989,714
Dividends					
<b>TOTAL EQUITY</b>	<b>4,357,777</b>	<b>4,954,703</b>	<b>5,499,706</b>	<b>6,044,710</b>	<b>6,589,714</b>
<b>LIABILITIES /EQUITY:</b>	<b>4,382,127</b>	<b>4,994,561</b>	<b>5,541,911</b>	<b>6,086,914</b>	

The profit and IRR improve substantially as the amount of manure processed daily is increased. The team has discussed this project with two groups in Thailand: a farm with 3,000 sows and 25,000 laying hens in the Chiang Mai area is very interested. The IRR for this venture is 9.17 percent.

Another group in the Bangkok region farming 6,000 sows and 3 million broilers per year has an IRR that exceeds 25 percent when their wastes are processed in the system.

#### POTENTIAL BUSINESS ARRANGEMENTS

Several approaches to establishing this business have been examined. Substantial interest was expressed by the owners of the pig farm in Chiang Mai. They have suggested an arrangement where the anaerobic digestion system would be financed by an investor who has expertise with the required technology.

They would provide the site, the raw material, and use of an existing feedmill as their contribution to the venture. They acknowledge the value of the biogas or electricity and are open to negotiations.

Another group located in the vicinity of Bangkok owns a 6,000 sow pig farm, a broiler farm producing 3 million birds per year, a feed mill, and a number of shrimp farms in the Songkhla area in southern Thailand. They also wish to consider a joint venture under conditions similar to those described above.

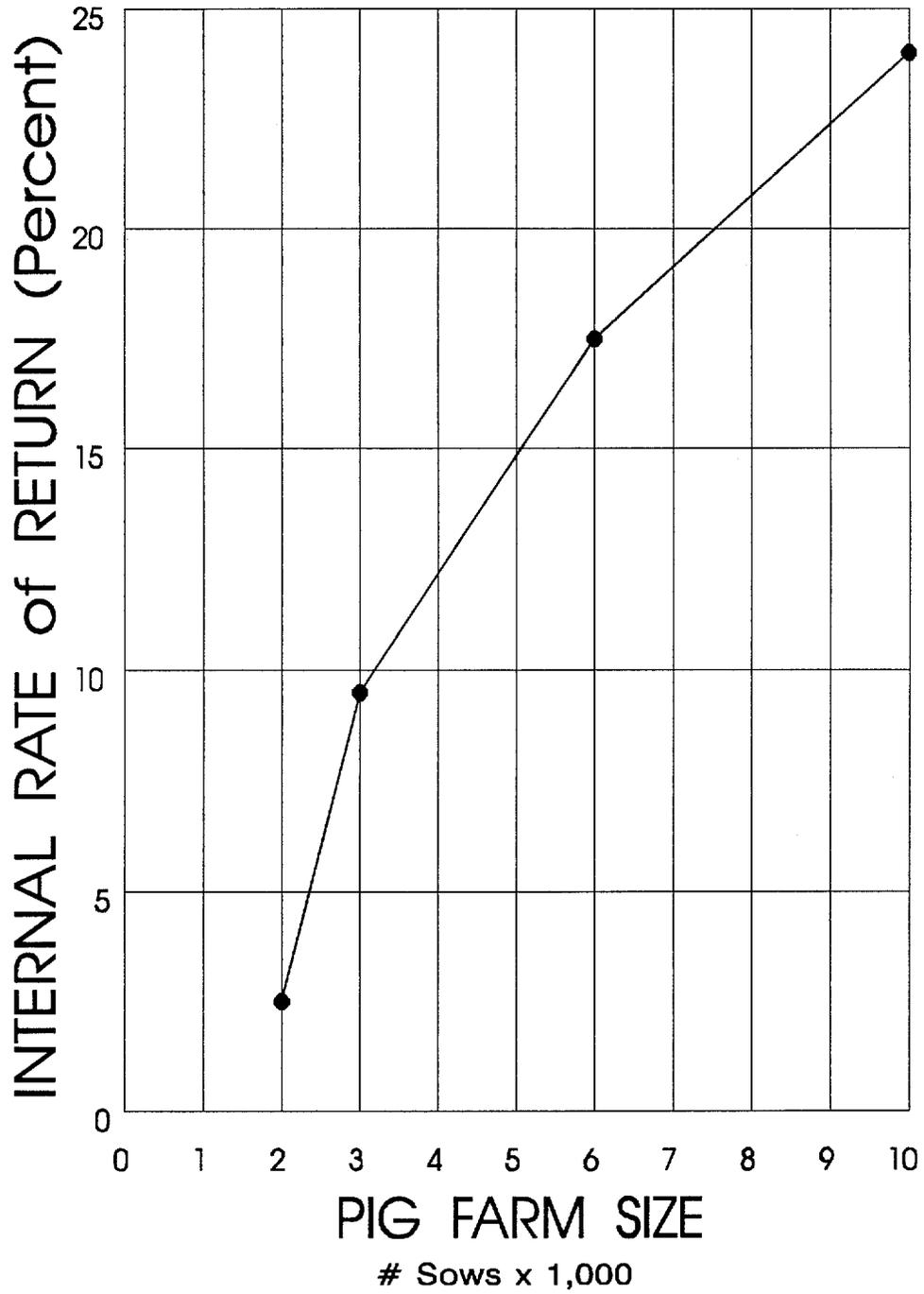
Table 19

CASH FLOW PROJECTIONS					
SOURCES of CASH	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
Net Income	(242,223)	596,926	545,004	545,004	545,004
Depreciation	94,898	288,275	288,275	288,275	288,275
Cash from Operations	(147,325)	885,201	833,279	833,279	833,279
Cash Provided By Changes In:					
Accounts Payable	24,350	15,509	2,345	0	0
Net Cash Provided By Operating Activities	(122,975)	900,710	835,625	833,279	833,279
FINANCING TRANSACTIONS					
Equity (US \$)	4,600,000	0	0	0	0
Loans	0	0	0	0	0
Net Cash From Financing Transactions	4,600,000	0	0	0	0
TOTAL SOURCES	4,477,025	900,710	835,625	833,279	833,279
APPLICATIONS of CASH					
Facilities	4,274,244	416,500	46,084	31,600	100,654
Loan Repayments	0	0	0	0	0
Dividends	0	0	0	0	0
Changes In Acc.Reciev.	0	100,653	0	0	0
Changes in Inventory	0	0	0	0	0
TOTAL APPLICATIONS	4,274,244	517,153	46,084	31,600	100,732,
Net Cash Flow /Period	202,781	383,558	789,541	801,679	732,625
Cash on Hand	202,781	586,338	1,375,879	2,177,558	2,910,183

Figure 9

# INTERNAL RATE OF RETURN vs FARM SIZE

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59	Summary
60	Background
61	Proposed Venture
61	Objectives and Key Success Factors
62	Seasonality of the Business
63	Research and Regulatory Influences
63	Market Analysis
64	Company Structure & Management
64	Risk
65	Thai Partners
66	Financial

### SUMMARY

This is a preliminary business plan for a new joint venture corporation. The company will purchase, process, and market honey and high value products derived from royal jelly and bee pollen. These products will be sold to wholesalers and distributors in Thailand and other Asian countries.

The new company will be developed from an existing honey products operation based in Chiang Mai. This firm has been operating as a honey collection and semi-processing firm for more than 15 years. Increasing costs of labor required for collection and greater profitability in processing and marketing are causing the company to shift its long-term strategy.

The owners have been actively involved in management and, along with the present staff, will transfer to the new company. The new company will require the addition of new staff.

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pgs-56-58

The firm has a strong base of beekeepers throughout Thailand for a steady source of raw material. It currently owns several pieces of the necessary equipment required for the processing plant and land has been purchased and is available for lease. Several of the products for the new venture are presently being marketed or prepared for sale.

The new venture requires capital for the new processing plant which can produce honey and other bee products of higher market value. Stronger research and development and marketing operations are needed for the new operation. These capabilities are expected to be provided by the U.S. partner.

The business will be capitalized at \$300,000. In keeping with Thailand laws, a majority of the shares will be held by the present managers. Part of the local capital will be contributed in the form of equipment currently in use. A positive cash flow is generated during the first five years and grows steadily as the business expands. An internal rate-of-return of 26 percent is projected.

## BACKGROUND

Bee keeping and honey production have been established in Thailand for many years.

Within the past decade, honey and other bee products such as bee pollen and royal jelly have become increasingly popular domestically and in other countries. This is mainly due to regulatory approvals by food and drug agencies in Thailand, Japan, and other countries.

The approvals increase the market value of bee products by allowing firms to promote and sell higher value, packaged health foods, particularly those made from royal jelly and bee pollen.

Growing domestic and export demand has stimulated the need for processing and marketing capabilities by private companies. This plan is a joint venture for a processing plant that will serve these market needs.

Bee keeping in Thailand is mainly a small scale business, but total production is quite large. Each year about 3,000 tons of honey, 100 tons of bee pollen, and 50-100 tons of royal jelly are collected. About 100,000 boxes of bees are used to produce these raw products. They are managed by small scale farmers and orchardists with support from honey and bee product buyers and processors.

Production and collection teams organized by the buyer-processors have traditionally moved the boxes around the country in sequence with the flowering seasons of various crops.

Increasing labor and other collection costs are lowering the profitability of this operation. At the same time, the profitability of processing and marketing honey and bee products is attracting an increasing number of companies into those segments of the industry. About 20 to 30 companies are now reported to be involved in this business.

#### PROPOSED VENTURE

The venture will originate, process, and market honey, bee pollen, and royal jelly which will be used to create high value, consumable bee products. Honey's primary nutrients are glucose and fructose. In Thailand longan and lychee flowers are the main food sources for honey. Sneru, kapok, cassava, and other field crops are other main sources.

Bee pollen is the collection of male gametes of plants which are carried back to the hive by worker bees. It is collected from the hives along with royal jelly and honey. Most pollens contain 18 kinds of amino acids and enzymes and 16 kinds of minerals and vitamins, and it is highly valued as a health food raw material.

It is commonly marketed as unprocessed powder or is processed into tablets and granular forms. The healthy food effects of bee pollen are proclaimed to be similar to those of royal jelly.

Royal jelly is a complex mixture of proteins, amino acids, lipids, carbohydrates and vitamins which is secreted by worker bees during the digestion of pollens and honey. In a natural system, it is fed to queen bees throughout their larval and adult lives and also to young worker bees and drone larvae. When it is collected, fresh royal jelly is sticky and milky in appearance. It is normally frozen and supplied to processors or dehydrated and processed into tablets and other consumable products. Processed royal jelly is proclaimed as a healthy food to retard aging, increase stamina, increase appetite, and generally improve nutrition.

#### OBJECTIVES AND KEY SUCCESS FACTORS

- The objectives of the new venture are:
- To maintain strong relations with producers to ensure a steady supply of raw honey and bee products.

- To establish a honey and bee products processing plant to produce a wider range of value-added products.
- To establish a marketing and trading organization in order to market and distribute those products.

The key elements for success of the venture will be processing of high value honey and bee products and then marketing these through domestic and export channels. Maintaining high quality levels and meeting domestic and foreign food and drug requirements will be the critical factors in exporting to Japan and other regional markets. The existing company is marketing some processed products. Other companies in the industry have developed a wider range of items with success.

There will be an important shift in the existing company's business focus toward more processing and marketing and away from collection. This firm now has good sources of supplies and strong connections to beekeepers. It is hoping to build on these strengths to more effectively compete in the processed products market by continuing to supply beekeeping equipment to it beekeepers. The company hopes to reduce costs of raw material sourcing by developing a more integrated system based on their producer contacts and sources of supply.

The existing managers have more than 15 years of experience in the business. Their aim is to continue to expand their interest in Thailand's bee products industry and deliver higher value items to the market at reasonable prices. They are fluent in English and several Asian languages and are familiar with market requirements in domestic and export markets. They are also technology-oriented and know their capabilities in the business.

#### SEASONALITY OF THE BUSINESS

The location, seasonality, and types of flowers available to bees is an important factor affecting honey production and processing, as well as the financial aspects of the processing operation. Longan, the primary and most valued flower, has peak flowering cycles every other year and is only grown in the northern part of the country. Lychee and flowers of other crops are used to make up for the shortfall but also have specific flowering periods and production ranges.

This variability of production causes peak buying and processing periods from July through December and, thus, puts a strong cash flow demand on the firm in the latter half of the year.

Honey marketing (mainly exports to Taiwan) tends to follow production. As the processing plant comes on stream, more high value products will be introduced which use honey as a raw material. Combined with sales of royal jelly, bee pollen, and other high value products, sales and cash flow will be more steady throughout the year.

#### RESEARCH AND REGULATORY INFLUENCES

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Bee pollen, royal jelly, and their derivative products are considered to be much like pharmaceuticals by the food and drug regulatory agencies of many countries. The venture's success, therefore, depends on approval of the company's products by these agencies. This will require an investment of more than \$400,000 or more in high quality equipment and supporting infrastructure. Much of this equipment is already owned by the present company, but more will need to be purchased for a new processing plant. It is hoped that the joint venture partner will assist with product development and marketing expertise in order to speed up product introductions and reduce time in obtaining regulatory approvals.

#### MARKET ANALYSIS

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Honey and bee products have very good market potential for growth.

Both domestic and export demand is expected to continue growing over the next five years. Some sources expect the annual growth to be 100 percent or more.

Export figures for honey show that both export and domestic demand is growing. In 1989 the value totaled about \$350,000 and in 1990 jumped to nearly \$1.4 million. (Part of this growth could reflect seasonal trends as discussed above.) Taiwan, Singapore, Japan, and Hong Kong are the main markets. The domestic market is also expanding significantly.

In 1989 natural honey imported to Thailand was valued at approximately \$220,000. In 1990 the value climbed about 10 percent to more than \$240,000. Australia, Germany and the U.S. were the primary sources.

Statistics for royal jelly and bee pollen are not available. The company has been marketing honey and some semi-processed bee products for several years. Current sales levels are well above those reflected in the early stages of the new venture. Most of their sales are to buyers in export markets who further process the products into high value items. Sales have also been made to processing companies selling in the domestic market (see Figure 10, Bee Products Projected Sales).

Through this market experience, the company's managers have seen a trend in the industry toward more processed consumer products. They have conducted some research on the overall market and specific high value products and see strong potential for several branded items. However, they are aware that more market and distribution efforts must be made before a joint venture is formed or specific products are launched.

At this time, they expect to distribute the company's products to several markets (see Table 20).

**COMPANY STRUCTURE AND MANAGEMENT**

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The joint venture company will be registered in Thailand with 60 percent of the shares held by the existing Thai company and 40 percent owned by the foreign partner.

Much of the management and labor will be provided by the existing Thai company.

Two major shareholders and operators of the present firm will assume responsibility for sourcing raw materials and operating the processing plant. Additional management will be hired for key marketing and sales positions.

The current operation has 20 workers employed in production and collection teams. Approximately 50-60 people will be required for staffing the processing plant. It is expected that many of the present staff will assume those positions and additional people will be hired to fill the remaining positions.

**RISK**

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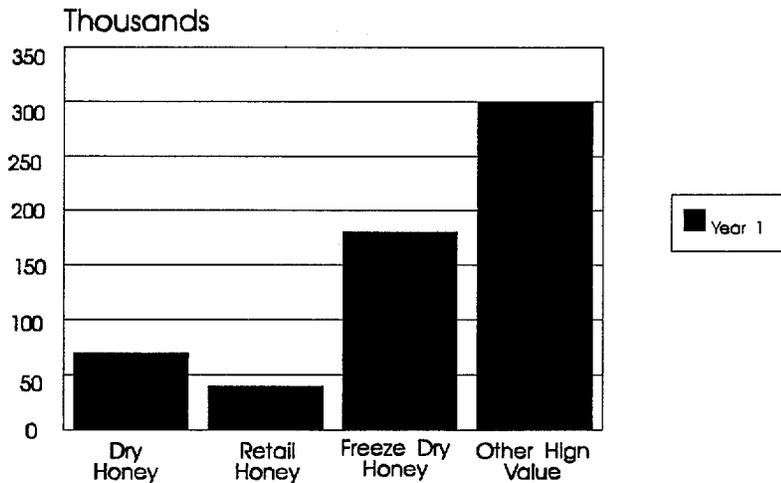
There are three critical risks and/or problems that must be recognized with this venture.

Table 20

PRODUCT	TARGET
Honey	Domestic and Export to Taiwan
Royal Jelly Products	Domestic and Export to Japan
Bee Pollen Products	Domestic and ASEAN Export

Figure 10

## Bee Products Projected Sales



1. Variability of raw material supplies. Seasonality and annual variability in the types and quantity of flowers available for bees to produce honey, royal jelly, and bee pollen could have a significant effect on the business. This risk can be managed as the new company develops a broader origination base and its storage and marketing capabilities.

2. Development of new value added products. The existing company has been primarily production and semi-processing oriented. It has not been extensively involved in developing new value added products. This will, therefore, be an area in which the new venture must move quickly in order to justify the large investment in plant, equipment, and other startup costs.

3. Marketing capabilities. This is closely related to Item #2 above. If the new products which are developed, as well as larger volumes of existing products, cannot be marketed effectively, there will be a negative effect on profitability.

### THAI PARTNERS

The Thai partners have operating experience and market contacts on which to develop the business. More marketing expertise and capital would allow the new venture to develop and increase profitability.

By constructing and operating a plant to produce consumer ready bee products, the firm will become more efficient and improve the quality of honey products for human consumption. Added value will also be given to nutritious and renewable raw materials produced in Thailand. As more export revenues are earned, Thai beekeepers will have a larger, more stable market demand for their products.

Conservative estimates for honey and products output and price have been used in formulating the financial returns. Only moderate sales levels are assumed in relation to those of the existing operation.

This is done to allow for the new and more diversified product range and the added marketing efforts required.

An initial capital base of \$300,000 is assumed for startup. Existing assets in the form of vehicles, processing equipment and storage equipment will be provided by the present management. Working capital needs will be met by contributions from both partners. Additional capital may be provided by either partner in the form of technology or management. Net income after taxes is \$58,000 in the first year and climbs to \$175,000 in the fifth year. The internal rate of return is 25 percent during the first five years.

FINANCIAL *Performance*

Financial projections for this venture are detailed in Table 21, Income Statement; Table 22, Balance Sheet; Table 23, Source of Funds; and Table 24, Internal Rate of Return.

Table 21

INCOME STATEMENT					
	YR 1	YR 2	YR 3	YR 4	YR 5
Annual Growth Rate	50.00 percent	35.00 percent	25.00 percent	20.00 percent	10.00 percent
Sales	Year 1	Year 2	Year 3	Year 4	Year 5
Dry Honey	\$69,600	\$104,400	\$140,940	\$176,175	\$211,410
percent of Total Sales	12 percent				
Honey - Retail	\$39,600	\$59,400	\$80,190	\$100,238	\$120,285
percent of Total Sales	7 percent				
Freeze Dry	\$180,000	\$270,000	\$364,500	\$455,625	\$546,750
percent of Total Sales	31 percent				
Other - Hi Value	\$300,000	\$450,000	\$607,500	\$759,375	\$911,250
percent of Total Sales	51 percent				
Total Sales	\$589,200	\$883,800	\$1,193,130	1,491,413	1,491,413
Cost of Sales					
Raw Materials	\$348,000	\$522,000	\$704,700	\$880,875	\$1,057,050
percent of Total Sales	59 percent				
Labor	\$63,360	\$95,040	\$128,304	\$160,380	\$192,456
percent of Total Sales	11 percent				
Overhead	\$2,400	\$3,600	\$4,860	\$6,075	\$7,290
percent of Total Sales	0 percent				
Total Cost of Sales	\$413,760	\$620,640	\$837,864	\$1,057,050	\$1,057,050
Gross Profit	\$175,440	\$263,160	\$355,266	\$444,083	\$532,899
Gross Margin	30 percent				
Operating Expenses					
Selling Costs	\$36,240	\$54,360	\$73,386	\$91,733	\$110,079
percent of Total Sales	6 percent				
Research/Development	1,030	\$3,600	\$5,400	\$7,290	\$9,113
percent of Total Sales	1 percent				
General & Administrative	\$49,680	\$74,520	\$100,602	\$125,753	\$150,903
percent of Total Sales	8 percent				
Total Operating Expenses	\$89,520	\$134,280	\$181,278	\$226,598	\$271,917
percent of Total Sales	15 percent				
Income from Operations	\$85,920	\$128,880	\$173,988	\$217,485	\$260,982
percent of Total Sales	15 percent				
Interest Income	\$0	\$0	\$0	\$0	\$0
Interest Expense	\$0	\$0	\$0	\$0	\$0
Income before Taxes	\$85,920	\$128,880	\$173,988	\$217,485	\$260,982
Taxes on Income	\$28,354	\$42,530	\$57,416	\$71,770	\$86,124
Net Income After Taxes	\$57,566	\$86,350	\$116,572	\$145,715	\$174,858
percent of Total Sales	10 percent				

Table 22

BALANCE SHEET					
Assets	Year 1	Year 2	Year 3	Year 4	Year 5
<b>CURRENT ASSETS</b>					
Cash	\$0	\$0	\$0	\$0	\$0
Investments	\$0	\$0	\$0	\$0	\$0
Accounts Receivable	\$0	\$0	\$0	\$0	\$0
Notes Receivable	\$0	\$0	\$0	\$0	\$0
Inventory	\$0	\$0	\$0	\$0	\$0
Total Current Assets	\$1	\$0	\$0	\$0	\$0
<b>PLANT AND EQUIPMENT</b>					
Building	\$75,000	\$112,500	\$151,875	\$189,844	\$227,813
Office Equipment	\$1,200	\$1,800	\$2,430	\$3,038	\$3,645
Leasehold Improvements	\$100,000	\$200,000	\$300,000	\$300,000	\$360,000
Less Accumulated Depreciation	\$20,000	\$30,000	\$40,500	\$50,625	\$60,750
Total Net Property & Equip	\$36,000	\$284,300	\$413,805	\$442,256	\$530,708
Other Assets	\$0	\$0	\$0	\$0	\$0
Total Assets	\$36,001	\$54,002	\$72,902	\$91,128	\$109,353
<b>LIABILITIES &amp; OWNER EQUITY</b>					
<b>Current Liabilities</b>					
Short Term Debt	\$0	\$0	\$0	\$0	\$0
Accounts Payable	\$44,103	\$66,154	\$89,308	\$111,635	\$133,962
Income Taxes Payable	\$28,354	\$42,530	\$57,416	\$71,770	\$86,124
Accrued Liabilities	\$0	\$0	\$0	\$0	\$0
Total Current Liabilities	\$72,456	\$108,685	\$146,724	\$183,405	\$220,086
Long Term Debt	\$0	\$0	\$0	\$0	\$0
Total Liabilities	\$72,456	\$108,685	\$146,724	\$183,405	\$220,086
<b>Common Stock</b>					
Common Stock	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000
<b>Retained Earnings</b>					
Retained Earnings	\$0	\$86,350	\$116,572	\$145,715	\$174,858
Total Equity	\$300,000	\$386,350	\$416,572	\$445,715	\$474,858
Total Liabilities & Equity	\$372,456	\$495,034	\$563,296	\$629,120	\$694,944
Return on Assets	159.90 percent				
Total Asset Ratio	6.11 percent				
Debt to Worth Ratio	-1.99	-1.99	-1.99	-1.99	-1.99
Gross Margin	29.78 percent				
Operating Margin	14.58 percent				
Earnings before Taxes Margin	14.58 percent				
Profit after Tax Margin	9.77 percent				
Return on Sales	32.81 percent				
Return on Stock Equity	19.19 percent	22.35 percent	27.98 percent	32.69 percent	36.82 percent
Leverage	12.00 percent	13.98 percent	17.50 percent	20.45 percent	23.03 percent
Administrative Efficiency	8.43 percent				
Selling Efficiency	6.15 percent				
Production Efficiency	70.22 percent				
Annual Growth Rate		50.00 percent	35.00 percent	25.00 percent	20.00 percent

Table 23

## Source of Funds

	Year 1	Year 2	Year 3	Year 4	Year 5
Income after Taxes	\$57,566	\$86,350	\$116,572	\$145,715	\$174,858
Depreciation & Amortization	\$20,000	\$30,000	\$40,500	\$50,625	\$60,750
Operating Cash Flow	\$77,566	\$116,350	\$157,072	\$196,340	\$235,608
Increased Long Term Debt	\$0	\$0	\$0	\$0	\$0
Issuance of Stock	\$300,000	\$0	\$0	\$0	\$0
Total Source of Funds	\$377,566	\$116,350	\$157,072	\$196,340	\$235,608
Use of Funds					
Marketing and Advertising	\$9,600	\$14,400	\$19,440	\$24,300	\$29,160
Salaries	\$82,080	\$123,120	\$166,212	\$207,765	\$249,318
Facilities	\$1,200	\$1,800	\$2,430	\$3,038	\$3,645
Capital Equipment	\$1,200	\$1,800	\$2,430	\$3,038	\$3,645
Research and Development	\$2,400	\$3,600	\$4,860	\$6,075	\$7,290
Operational Expenses	\$58,800	\$88,200	\$119,070	\$148,838	\$178,605
Increased Working Capital*	\$0	\$0	\$0	\$0	\$0
Total Use of Funds	\$155,280	\$232,920	\$314,442	\$393,053	\$471,663
Total Fixed Costs	\$5,968	\$7,460	\$8,952		
Gross Profit	\$47,073	\$22,560	\$1,272		

Table 24

## Internal Rate of Return

INVESTMENT	300,000					
INCOME TAX RATE	33 percent					
INTERNAL RATE OF RETURN	26.32 percent					
GROSS TAXABLE INCOME						
YEAR	SAVINGS	DEP.	TAX SAVINGS	NET CASH AFTER TAX	SAVINGS	FLOW
0						(300,000)
1	85,920	20,000	65,920	21,754	44,166	64,166
2	128,880	30,000	98,880	32,630	66,250	96,250
3	173,988	40,500	133,488	44,051	89,437	129,937
4	217,485	50,625	166,860	55,064	111,796	162,421
5	260,982	60,750	200,232	66,077	134,155	194,905

*INVESTMENT #5:  
SEED/BULB/ROOTSTOCK  
PRODUCTION AND MARKETING*

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<u>73 Summary</u>
<u>73 Background</u>
<u>74 Proposed Venture</u>
<u>75 Financial</u>

SUMMARY

This opportunity for propagation and sale of introduced commercial varieties in Thailand could be developed as an enterprise associated with an existing commercial seed/bulb farm or as a separate business. The operation would best be situated in the Chiang Mai area due to that region's favorable climatic conditions and proximity to many high quality commercial growers.

A joint venture with an international company which specializes in research and development of new varieties is recommended. This arrangement would offer the Thai partner ready access to a broad range of genetic material, production and marketing expertise, and possibly capital for startup of the venture. The international company would gain access to a favorable research and production area, as well as new markets for its varieties.

BACKGROUND

Thailand currently imports more than \$1 million worth of cut flowers each year and exports more than \$25 million.

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Pgs - 70 - 72

Table 25

## PRIMARY CROPS:

hybrid tomato	hybrid eggplant	hybrid sweet pepper
hybrid of Cucurbitaceae	hybrid peas and bean	hybrid lettuce

This large and growing domestic and export demand suggests that Thailand is well situated to increase its standing among world flower producers. As the market potential grows, so will Thailand's demand for high quality, market acceptable genetic material for production of roses and other flowers. There is also potential for Thailand to become a regional export base for root stock and other genetic materials used in the floricultural industry.

PROPOSED VENTURE

ASACI found several promising opportunities. One has been operating for six years and has research, production and international marketing experience. This seed and bulb firm was established in 1985 by a group of Kasetsart University professor and alumni, and they have formed a seed production division and research development division with the following objectives:

- To develop practical techniques of hybrid seed production of vegetables and flowers in tropical climates and then establish a commercial program in hybridized rootstock and seed multiplication for foreign countries as well as local consumption.
- To improve local vegetables and flowers seed for local market and to test new varieties.
- To distribute high quality seed as a result of propagation.
- To develop the extension work system by the firm for contracted farmers.

After proven tests for hybrid seed production are employed, the technology is transferred to staff, a proven product line, and then to contract farmers. (see Table 25, Primary Crops and Table 26, Open Pollinated Flowers)

Table 26

## OPEN POLLINATED FLOWERS:

Cosmos	Balsam	Zinnia
Pansy	Canna	Cleome
Vinca	Moonflower	Celosia
Antirrhinum	Marigold	

After a pilot project with tomato hybrid seed by 20 contracted farmers, the commercial operation of 200 farmers produced 2,000 kilograms of seed. The firm produced four tons of hybrid tomato seed last year on contract for three separate companies -- U.S., Europe, and Taiwan. It is premature to consider a partnership, equity or a joint venture.

The company expanded into flower seed production in 1988 and now produces 20 varieties of open pollinated seed on contract with technical assistance exchange with a company in another Asian country.

This firm makes effective use of the Horticulture, Entomology and Plant Pathology departments of Kasetsart University. The objectives of the breeding program are:

- Develop hybrid seed for local market (cucumber, water melon, pumpkin).
- Develop improved varieties for agribusiness crops (peas and beans).
- Develop tropical flower seed for local market.
- Reproduce bulbs for flowers and vegetables such as lilies and gladiolus.
- Expand the tissue culture laboratory and develop tissue culture plants.

This firm has grown to thirty temporary employees with over 100 contract farmers.

The management has been pleased with recent experience with a U.S. seed firm and would like to generate a contract in each major area.

#### FINANCIAL

The team noted two areas for specific consideration. A U.S. bulb producer may have a different size of bulbs that are not commercially viable in the U.S. market. For example, two million of those bulbs could be sold to this firm each year with a budget of \$50,000 to \$75,000 for technical assistance and related travel. Along with the sale of bulbs, the US firm could expect a return based on the improved sales of bulbs and a seat on the board for monitoring and assistance purposes.

The tissue culture project is promising based on the climate and technology. The current varieties of the dedordrum orchid could replace the existing varieties. This high volume item could be handled on a research station to research station basis (U.S. Government to Thai Government for mutual exchange of information) with this firm being one of the qualifying research stations.

*INVESTMENT #6: PEANUT SNACK  
FOODS MANUFACTURE AND  
MARKETING FOR THAILAND AND  
REGIONAL EXPORT*

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79	Summary	
79	Background	
80	Proposed Venture	
80	Problems	
81	Opportunity	

SUMMARY

The opportunity exists for introducing dry roasted, shelled, skinless plain and flavored peanuts to the domestic Thai and nearby export markets by establishing a snack foods production plant in the northeastern area.

BACKGROUND

Per capital income has been increasing in Thailand -- from 15,271 Baht (\$601) in 1984 to 24,860 Baht (\$978) in 1989 -- and is the highest growth rate in the Southeast Asia region. Along with the rising income has been increased migration to the cities, a faster paced lifestyle, more television, and a greater interest in fast foods, including snack foods.

Fast foods and snack foods have gained acceptance in the forms of Kentucky Fried Chicken, McDonalds, baked cookies, chips and limited peanut (ground nut) based snack goods. Indications are that these products are becoming more widely accepted. With increasing income, television and, other exposure, the market outlook appears bright.

Previous Pages Blank

pgs - 76 - 78

Currently, approximately 160,000 tones of peanuts are produced annually in Thailand. Production is in both the rainy and dry seasons with slightly more production in the dry season. Numerous assemblers buy the production from thousands of small farms (averaging less than one acre of peanut production each) and sell directly or through intermediates to commercial peanut handlers and shellers as well as numerous smaller retailers. The major shellers and handlers usually sell in-shell peanuts or shelled, skin-on peanuts to distributors, retailers, further processors, or, in some cases, nearby export markets.

Further processing of peanuts in Thailand is limited to skinless, fried (oil roasted) peanuts, oil roasted peanuts coated with a flour, sugar, and coconut milk mix containing 50% peanuts and 50% flour; oil roasted peanuts coated with a 50% flour, sugar and cuttlefish mix; and oil roasted peanuts coated with a 50% flour, sugar, coconut milk and coffee flavor. Dried boiled in-shell peanuts, vacuum packed in cellophane packing, was also observed in the market place. There appeared to be no nitrogen packing or other quality presentation methods found among the locally produced products.

The products taste tested were found to exhibit the flour taste prominently and not considered a first quality peanut product. Rancidity was also found in many of the products. The in-shell peanuts were also found to be of lower quality.

No dry roasted peanuts were found in the market place, or discovered through industry contacts, other than a limited amount of U.S. produced and processed dry roasted peanuts found in one very upscale food market and at a very high price.

#### PROPOSED VENTURE

A market opportunity exists for introducing dry roasted, shelled, skinless plain and flavored peanuts to the domestic Thai and nearby export markets. Local expertise and market tests could determine if currently available western flavorings are acceptable or if new flavorings are required.

Top quality blanched oil roasted plain and flavored peanuts could also be incorporated into a product line utilizing common packaging and distribution systems. Also, mixtures of cashew nuts, pecans and other nuts could be blended with peanuts to create additional products.

Candy (sugar) coated peanuts is another product that would seem to appeal to the regional market, which tends to prefer high sugar levels in many products.

#### THE PROBLEMS-SUPPLY AND QUALITY OF RAW PRODUCT

A dependable supply of competitively processed, quality raw product is essential for premium snack food products.

Local prices, as well as production, appear to be competitive. However, much of the local production appears to be of a quality unsuitable for premium quality peanut products.

Conversations with those knowledgeable of the industry indicate that aflatoxin contamination is a problem in current Thai production, especially production during the wet season. The toxin, which can cause severe food poisoning, results from mold growth and typically occurring during the harvest phase of peanut production and marketing.

#### SOLUTIONS TO THE PROBLEMS

The problem of supply of quality raw product can be met, in part at least, by increased dialogue and education with local farmer groups and cooperatives. Details of such a program can be developed, but are beyond the scope of this profile.

The aflatoxin problem can be monitored by product sampling and laboratory analysis, which must be a component of quality snack food manufacture. The problem of aflatoxin occurrence can be minimized by increased attention at time of harvest and drying procedures.

#### THE BUSINESS OPPORTUNITY

The opportunity exists to establish a snack foods production plant in the northeastern area near the areas of

production to produce peanut based snack foods for domestic consumption and regional export.

The emphasis should be on premium quality products for the premium markets for the country and region, as well as other markets. Special emphasis should be placed on kernel size and quality, material quality and packing. Marketing and distribution should be directed to premium and mass markets.

Local Thai businessmen familiar with the national and regional markets are ready to make an investment in a state-of-the-art American style snack food plant with American quality control. A suitable American partner should be found to provide technical assistance in facility design, equipment procurement and installation, quality control, and production technology.

As with market research, a detailed economic analyses has not been conducted. The American partner's involvement can range from a minimum of services in providing the various technical know-how and specifications to investing in a substantial equity position in the venture. Returns to the American partner would be determined by the degree of involvement and negotiation.

INVESTMENT #7: CUT FLOWER  
IMPORTS FROM THE US

PROPOSED VENTURE

Opportunities exist for imports of cut flowers and other floral products to Thailand from the U.S. Thailand now imports nearly \$2 million worth of flowers each year. Most of these shipments originate from the Netherlands, Malaysia, and other Asian countries. The U.S. has only a very small share of the market.

Price competitiveness, quality, and accessing domestic market channels will be key factors in successfully importing from the U.S. Landed prices from the U.S. must be competitive with shipments from other sources. The largest single cost factor is air freight costs. The increased numbers and frequencies of flights between Thailand and the U.S. by American flag carriers is a positive factor, however. The carriers' representatives in Thailand are eager to support any U.S. shippers that would like to sell to Thailand and can offer preferential rates with sufficient volumes. Customs regulations including phiso-sanitary requirements along with good relations with freight forwarders is critical.

Previous Pages Blank

Pgs - 82 - 84

Maintaining quality and accessing buyers are other important considerations. Since imports from the U.S. are small, the market may not be used to the varieties and general quality levels offered by US shippers. U.S. imports will already be at a disadvantage compared to other origins due to long transport time. Delays at customs could be disastrous. Hence, ownership of a company-controlled cool-storage and/or development of an efficient distribution may be necessary.

Significant investments will be required to research the Thai market, make contacts with buyers, and offer test shipments to prove the acceptability of U.S. quality. Competitors from Holland and Malaysias are very strong and well established. Success of the U.S. importer will require local market penetration. Market research is required to identify segments and channels of distribution. Pricing strategy must be market-driven.

Impacts of declining tourism at present and the resulting effects on hotels and restaurants could affect flower imports.

The marketing network must rely on trustworthy connections and good relationships with local wholesalers and retail outlets.

If this trade can be developed, it will offer benefits to U.S. flower exporters and Thai importers. Success depends largely on the quality of the people involved at all levels of the supply chain. U.S. shippers will have accessed a new and growing market while Thai buyers will have broadened their sources of supply to offer local customers.

89 Summary  
90 Proposed Venture  
90 Market and Sales  
91 Risk

SUMMARY

A significant opportunity exists for investment in an integrated cut flower and foliage company based in Thailand. This company would best serve the needs of the market, Thai flower producers, and the Thai economy by integrating its marketing operations with a facility producing flower bouquets and other value added products for export. A capability to offer new varieties and production inputs to growers would also bring long-term benefits to the company and the industry.

The business would best be located in the central region since it is the production, marketing, and transportation hub for much of Thailand's flower business. The venture could be done by a Thai owned company. However, a linkage with an internationally known flower company could offer market feedback which will benefit the production facility.

Developing an integrated company which "processes" and exports "value added" products and links growers with the market would need to be a multi-stage project due to the present structure of the Thai flower business.

Previous Pages Blank

Pgs 87-88

The industry is such that growers now have little access to new varieties or direct linkages with buyers in export markets. This is due to the large number of small scale growers with limited incomes to support new investments. There are more than 4,000 orchid growers in Thailand. Another factor is the dominance of local flower merchants and buyers in the domestic trade who, directly or indirectly, tend to limit the flow of market information to growers. The net result is that the local industry has more difficulty in adapting to demands of the world market than other world suppliers.

#### PROPOSED VENTURE

The production of cut flowers is a capital intensive venture that can potentially generate large sales in a relatively short time. Cut flower production also requires a great deal of technical skill, attention to detail and a close working relationship with a broker or agent in the chosen market. Internal rates of return often exceed 30 percent on many floral crops.

#### MARKET AND SALES

Trends in the Thai and international flower business are a good indication of the potential for success of this venture. In recent years, Thailand has developed into a small flower growing and export center in Asia.

The country now ships about \$25 million worth of flowers to countries around the world. Most of these exports are orchids and other cut flowers destined for markets in Japan, the Netherlands, Germany, and several Asian regional countries. There are also increasing exports of some tropical flowers and foliage.

There are plans for continued expansion to the European Common Market and Japan as well as the U.S. but efforts to date have not been promising primarily due to a lack of practical, technical assistance and a lack of knowledge of that distant cut flower market. The major competition for this market is from Colombia, Kenya, South Africa, Israel and Spain. Thailand production will have to meet some stiff quality and sanitary standards to win a share of this market. Today's market is a more difficult market to enter than it was 10-15 years ago.

Export sales to large markets such as the U.S. and Europe require specialization in one or two crops that complement each other. This is especially true for small farms or production units. This allows some "economy of scale" and permits the development of successful production experience for the horticulturist, management and work force.

The Thai export production evolved from growers who supplied the local market and were not satisfied with their rate of return, then exported to Japan and other neighbors. A local market is often a very "forgiving" market. Thus, the local market will often absorb low-quality production at relatively high prices by world standards.

Most floral exports will be marketed by brokers or wholesalers in the world cities serviced by major international carriers. A close working relationship between broker and grower will be needed to ensure that a good product mix and quality reach the ultimate consumer. This service is an additional value that should ensure one's place in the market.

### RISK

The floriculture industry is a dynamic and exciting activity with tremendous profit potential and satisfaction. However, in the real world, there is a "down side" to floriculture. A greenhouse can become a "bottomless pit", consuming money at a rapid rate for the naive or careless management.

After visiting several operations, observing their plants and activities and working with their agronomists on some relatively basic concepts, we must conclude that there are some serious barriers to the future growth of this industry.

Some of these problems are climate concerns, others are technical matters and finally others are people and management concerns.

Here is a partial list of concerns that must be addressed by the industry and those who encourage its support and growth:

- Educational training with more emphasis on applied principles of horticultural science.
- Technical assistance is lacking at the local extension agent level as well as foreign assistance.
- Understanding of the effects of environmental factors upon plant growth and their control.
- Information on soil preparation and proper planting densities.
- Pruning and harvesting programs.
- Grading, classification and bunching of flowers.
- Storage, handling and shipping of flowers.
- Pre-cooling and use of floral preservatives.
- People management skills for efficient operation.

- Proper understanding and use of refrigeration space.
- Knowledge of world flower grades and standards.
- Isolation from the rest of floricultural production and ideas.

Environmental factors in Thailand result in a large-scale laboratory experiment:

- Very hot temperatures
- Cool elevations,
- Low light intensity ,

High humidity, and

- High Levels of Carbon Monoxide

Some concerns were noted by the team:

- Lack of technical support services
- Nutrition
- Plant protection
- Post-harvest care

- General care and maintenance
- Lack of refrigerated storage space at airport
- Problems of importing seeds or planting materials due to bureaucratic delays, arbitrary decisions in customs or additional taxes for products to be grown and then exported (VAT).

There is nothing magical about growing flowers. It is a lot of hard work, quick decisions and a sound foundation in plant physiology, common sense and people skills. These concerns must be addressed and resolved by intensive training by an individual or by individuals who are knowledgeable of the "book learning" process as well as the practical realities of a developing nation. In summary, there is some good potential but also some challenges that the nation and a potential investor must address before making a commitment.

*INVESTMENT #6: PEANUT  
PRODUCTION & QUALITY  
IMPROVEMENT*

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SUMMARY

An opportunity exists to improve production, varieties, techniques, field layout mechanization, as well as harvesting and handling, for peanut production in Thailand.

BACKGROUND

Thailand produces approximately 160,000 tones of peanuts annually. Of that amount, (7%) seven percent is exported to nearby countries. Most production is of the Spanish variety. Farmers prefer the Spanish varieties because of their fruiting at shallow levels, which makes for easy hand harvesting. All peanut harvesting in Thailand is by hand. Average peanut yields for the country is about 1,182 pounds per acre. By comparisons, U. S. production levels on irrigated land, using latest varieties and production technology, averages 3,500 to 4,000 pounds of peanuts per acre.

Thailand has two growing seasons per year -- a dry season from October/November to February/March is followed by a wet season from April/May until October. It is generally necessary to have irrigation to grow crops in the dry season to ensure a good crop.

Previous Pages Blank

Pgs - 93 - 94

All irrigation observed was flood irrigation. Most, if not all, peanuts in Thailand are produced on irrigated land in the dry season; or produced on upland (non-irrigated land) during the wet season.

### PROPOSED VENTURE

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The business opportunities in this project may be categorized as supplying services and know-how in the following areas:

#### I. Improved production

1. Improved varieties
2. Improved production techniques, including
  - a. Improved field layout and mechanization
  - b. Use of sprinkler irrigation on suitable upland areas

#### II. Improved harvesting and handling

1. Mechanical harvesting and handling
2. Mechanical drying

An Irrigation Development Cooperative (a government sponsored development cooperative) is interested in developing improved production as noted and has suitable land area and water resources for doing so. A nearby peanut handling and processing firm is interested in working with the Irrigation Development Cooperative in offering improved drying and handling.

The opportunity exists for an American partner to supply equipment and know-how to both the production and handling aspects of the project. There are the possibilities of joint venture agreements in both cases, or minimally, the possibility of supplying services and know-how only.

No economic analysis has been attempted in that returns could vary widely, depending upon the nature of agreements.

### RISK

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The U. S. export opportunity is to market improved variety peanuts and harvesting, handling, and drying equipment. The Thai opportunity is to increase peanut production for internal consumption and regional export.

Producing high quality peanuts, free of aflatoxin, will open up markets which do not accept current production. The availability of higher quality peanuts should stimulate internal consumption. One of the traditional obstacles to be overcome by farmers -- that of simply moving from the status quo -- is not considered to be the major problem in this case.

Rather, the major problem is believed to be the availability of mechanical harvesting, drying, and handling procedures due to the small size production units. Most of the aflatoxin problems are believed to occur during harvesting and handling, and can be eliminated by timely harvesting, drying, and handling procedures. The higher yielding peanut varieties of the runner varieties are more difficult to harvest by hand than the Spanish varieties. Thus, mechanical harvesting and drying would solve, or materially contribute to solving, both problems. However, typical production units are less than (1) one acre and are frequently in irregular shaped fields.

Preliminary discussion with cooperative representatives and village farmers indicate an interest in, and willingness to try, new methods. It is believed that the willingness can be translated into improved production practices, including larger and better organized production units.

ASAC INTERNATIONAL

8301 Greensboro Drive, Suite 260  
 McLean, VA 22102  
 Phone: 703-356-2455  
 Fax: 703-356-2488

The American Society of Agricultural Consultants International is the international arm of the American Society of Agricultural Consultants -- a nonprofit incorporated association of America's premier agribusiness consultants. The nearly 400 members of the Society are experienced professionals, many with advanced degrees, who are dedicated to helping developing nations improve their resources and markets through private sector initiatives. ASAC International serves as developing countries' gateway to the American agribusiness sector.

ASACI's strength is in the caliber of its consultant members. Examples of the caliber of ASACI's membership: the Manager of one of the Nation's largest farming companies, a banker charged with developing agricultural loans for one of America's largest banks, and a CEO of a multi-billion dollar international food company.

The general qualification statement for ASAC International membership indicates representative overseas work assignments for many countries throughout the world and includes screening to assure professionalism and length of time in the profession, as well as tested by their clients in the private and government sectors. Their experience encompasses the broad spectrum of agribusiness endeavor including business management, agricultural economics, animal sciences, plant science, food processing and marketing and training.

ASACI consultants have completed 75 project investment profiles involving 14 countries resulting in 15 implemented projects, which have generated millions of dollars in new joint venture businesses. More projects are in various stages of development.

ASACI's successful program through international projects are implemented is the "INTEGRATED AGRIBUSINESS DEVELOPMENT PROGRAM FOR MODERN FOOD SYSTEMS." A summary of the Program follows:

- PRE-TRAVEL INVESTOR SURVEY:** This component is carried out on an on-going basis by the ASACI Project Manager. The extensive list of interested investors, ASACI investor database, ASACI member contacts, and ANE sources is contacted and their interests are noted. These primarily focus on country and enterprise interest. Also, information is secured on special interests that may relate to Thailand.
- IN-COUNTRY RECONNAISSANCE:** This component is carried out by a three-person team that visits Thailand to collect sufficient information to prepare an introductory assessment report on the following: 1) agribusiness investment climate and potential for U.S. agribusiness investor involvement, and 2) prospective enterprises and prequalified potential joint-venture partners in Thailand.

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Pg - 98 - 100

**IN-COUNTRY AGRIBUSINESS OPPORTUNITY PROFILES:** This is the main thrust of in-country efforts by ASACI. A five-person team examines and provides in-depth profiles on the previously identified opportunities. The profiling work usually involves marketing assessments, management assessments, financial analysis, economic analysis, agribusinesses, identification of training needs, and analysis of export opportunities for U.S. goods and services and investor interface.

**MARKETING AGRIBUSINESS PROFILE OPPORTUNITIES:** This component involves the marketing of profiles to U.S. investors. ASACI accomplishes this using four main strategies:

1. Extensive contact with potential investors who were identified in the pre-travel investor survey component. In addition to marketing considerations, our process identifies specific interests by enterprise and specific types of agribusiness investors and creates a perpetual cycle of investor interest.

2. Potential investors listed in the ASACI computer database are contacted. This database provides names of specific U.S. investors and countries and specific enterprises that interest them.

3. Potential investors who are known and identified by the team members and ASAC membership through "executive referral." That is, ASAC members approach U.S. agribusiness executives at the decision making level to present and discuss the trade and investment opportunities.

Having established years of a professional level of trust and confidence with their private sector clients, ASAC members have a unique access to U.S. agribusiness decision makers. This access is necessary for successful investment promotion.

4. Contact with potential investors recommended by other private and governmental agencies.

**IN COUNTRY TEAM BIOGRAPHIES**

**Marshall Burkes, Ph.D.**

President  
AMBUR  
912 Schumann Drive  
Madison, WI 53711  
USA  
(Tel) 608-273-2024  
(Fax) 608-273-0974

Marshall Burkes is CEO of AMBUR, a family firm that specializes in international financial management and business services.

Recent assignments include:

1. Developing a business plan for rehabilitating a problem company for processing a specialized agribusiness commodity with a global market;
2. Determining the feasibility of a new securities instrument for credit unions and retirement funds;
3. Assessing the capacity and interest of specific longer term investors;
4. Developing strategic plan for a new venture company; and
5. Marketing specialized investment products to public and private retirement funds on a national basis.

Dr. Burkes was born and raised on a cattle ranch in Oklahoma on Choctaw family headright land. Following degrees from Oklahoma State University, Purdue University and Ohio State University, he has worked in the financial and investment communities at the state, regional, national and international level. This includes CFO and CEO positions in Farmers Home Administration, Federal Home Loan Bank System, International Finance Corporation and the Wisconsin Investment Board.

Dr. Burkes has served on The Executive Committees of the Council of Institutional Investors in Washington D.C. and is a member of the International Agricultural Economic Association and the American Society of Agricultural Consultants.

**Roy C. Ferguson, II, BS**

Chief Executive Officer  
The Ferguson Group (Tulsa), Ltd.  
10726 South 68th East Avenue  
Tulsa, OK 74133 USA  
(Tel) 918-299-4466  
(Fax) 918-298-1201

Mr. Ferguson is President of Ferguson Group (Tulsa) Ltd., A company specializing in business turn-arounds and strategic planing for agriculture & agribusiness based in Tulsa. The company serves private and institutional clients in the U.S and overseas.

## Appendix B

He developed financial ratio and index guidelines for managing agricultural firms. In addition to preparing economic penetration studies of six industries, he authored the book, "Managing for Profit in Commercial Agriculture, published in 1990. He is a frequent contributor to U.S. agricultural publications, having published more than 260 articles.

Mr. Ferguson's prior responsibilities include service as chief executive officer (CEO) of the U.S. operations of a European swine breeder, a venture capital company involved in swine production, a commercial insurance and lending firm, and a family owned turkey breeding firm where he directed operations in 14 countries.

He is a former member of a special advisory committee to the Secretary of Agriculture. He was invited by the Tanzanian Government to study their national oil seeds industry, and was a member of a British agribusiness delegation to the Soviet Union.

Mr. Ferguson has participated in Harvard Business School case studies and has guest lectured at Oklahoma State University, Kansas State University and the Colorado Graduate School of Banking.

A native of Oklahoma, Mr. Ferguson holds a Bachelors Degree in Business Administration. In addition, he is certified agricultural consultant and a certified management consultant. He is past president of the American Society of Agricultural Consultants and holds memberships in other professional organizations.

### **Joseph H. Marshall, Ph.D.**

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President

Southern Plantations Group

2410 Westgate Boulevard

Albany, GA 31707

USA

(Tel) 912-439-0012

(Fax) 912-883-8881

Dr. Joseph H. Marshall is President and Managing Director of Southern Plantations Group, Inc. (SPG), Albany, Georgia, U.S.A.. SPG is an agricultural, forestry, and agribusiness management consulting organization providing services to investors and Landers in the United States and abroad. His responsibilities include corporate administration, project evaluation & acquisition, land management & development, appraisal and consulting on agricultural & agribusiness projects on a global basis. Dr. Marshall's consulting activities have included most areas of the U.S, Asia, Europe and Latin America.

Before forming SPG in 1987, Dr. Marshall was employed by Gold Kist, Inc., Atlanta, Georgia, a regional agricultural corporative operation in the southern United States, and involved in the producing, processing, and marketing of agricultural commodities and supplies. At the time of his departure to form SPG, revenues of Gold Kist were two billion dollars per year. His last position was Vice-President, Corporate Development, which included the administration of the companies, activities in strategic planning, technical research & development, economic research, engineering and related service.

## Appendix B

Dr. Marshall's prior experience was at Cornell University, where he held research & teaching assignments in agricultural economics; while a Doctoral candidate and on family properties where he participated in the management of farming operations.

He is a native of Georgia, where he grew up on a farm. He is a graduate of the college of Agriculture, University of Georgia, and received the Master of Science and Doctor of Philosophy Degrees from Cornell University, Ithaca, New year, specializing in agricultural economics.

Dr. Marshall is a certified agricultural consultant. He is a member of the American Association of Agricultural Economist and other professional organizations. He is a member of the advisory council of The Cornell University College of Agriculture & Life Sciences, and past president of the American Society of Agricultural Consultant. He is past president of the Georgia Association of Agricultural Economists, and past president of the Georgia Chapter, American Society of Farm Managers and Rural Appraisers.

### **Michael E. Peden, MBA**

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Vice President

International Agribusiness Projects

American Society of Agricultural Consultants, International

8301 Greensboro Drive, Suite 260

McLean, VA 22102

USA

(Tel) 703-893-8303

(Fax) 703-356-2488

Michael Peden is Vice President, International Agribusiness Projects for the American Society of Agricultural Consultants International (ASACI), McLean, Virginia, U.S.A. ASACI is the international operational arm of the American Society of Agricultural Consultants, an organization of Animal, plant, food, business management and other consultants serving the worldwide agricultural and agribusiness community. His responsibilities include the organization and management of economic and technical assessment and business development teams (Chief of Party) for developing countries and providing response to enquiries requesting expert assistance in the private sector.

His prior experience includes serving as Vice President, IMS, Inc. a domestic and international Agribusiness Consulting firm based in Florida Business Manager and Agriculture Director, Florida Sheriffs Ranches, Inc. a 5,000 acre cattle and crop operation providing employment and training to " at risk youth" in Florida; and as an Agribusiness Management instructor in a public school system in Northern Florida.

He has developed many micro-computer progress for use in Agricultural Management. He is a native of Texas and a graduate of the College of Agriculture of Auburn University, Auburn, Alabama. He received the Master of Business Administration Degree (MBA) from Jacksonville University.

Mr. Peden is a certified Agricultural Consultant and a member of the American Society of Agricultural Consultants; a certified member of T.R.I.A.L, Technical referrals in agricultural Litigation, and other professional organization.

**Robert Shleser, Ph.D.**

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President

Aquicultural Concepts, Inc.

P. O. Box 560

Waimanalo, HI 96795

USA

(Tel) 808-259-8049

(Fax) 808-259-8049

Robert Shleser, is President and CEO of Aquacultural Concepts, Inc.. He has a B.S in Agriculture, and a Ph.D.in Genetics from Purdue University. More than 15 years of experiance in aquaculture began in 1969 with a program to breed Maine Lobsters at Martha's Vineyard, Massachusetts. In 1972 he initiated and developed the aquaculture programs of the University of California, at Davis, UCLA, and the Bodega Bay Mariculture facility. He served a technical consultant to the Ralston Purina Corporation in their marine shrimp programs in Florida and Panama from 1973 to 1976.

In 1976 he became a consultant to the Ecuadorian firm, Empacadora Shayne and assembled the technical team that developed and built the first commercial shrimp hatchery and breeding facility in Ecuador. He joined the Oceanic Institute of Hawaii in as the Director of Research and Vice President In 1978 he established the Oceanic Institute Marine Shrimp program which provided the foundation for the commercial shrimp activities in Hawaii today. Intensive production technology developed at the Oceanic Institute is being used in the many locations in the world.

In 1984, Dr. Shleser founded Aquacultural Concepts, a Hawaii based consulting firm which provided consulting services to governments and the private sector on most aspects of commercial aquaculture. The firm has emphasized; site selection, feasibility analysis business planning and trouble shooting in commercial shrimp farming. In the last few years, Shleser has focused his consulting activities on anaerobic digestion of animal manures and other types of organic waste to produce methane, organic fertilizer, and ingrediants for animal and aquaculture feeds. Dr.Shleser presently serves on the technical advisory board of UNISYN Corporation and is a member of the World Aquaculture Society, the Caribbean Aquaculture Association and the Florida Aquaculture ociation

**Tim Welsh, BS**

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Managing Director

AgriSource, Ltd.

36/11-12 No. 21, Soi Land Suan

Bangkok, Thailand

(Tel) 662-253-5858

(Fax) 662-253-5858?

Tim Welsh is Managing Director of Agrisourcee Co., Ltd., Bangkok, Thailand. The company was founded in 1989 and provides market research and project management services in South-east Asia. Clients include private companies and public agencies from the U.S., Thailand, and elsewhere.

## Appendix B

Recent activities have involved field crop and vegetable seeds, vegetable oils, dairy production, livestock genetics and farm and food handling equipment. Also, included are fruit and vegetable exports and training for groups from other regional countries.

Before forming AgriSource, Mr. Welsh was employed as a commodities merchant for a major interanational agribusiness company where he traded grains and oilseeds. He was earlier International Marketing Director for the USA Dry Pea and Lentil Council where he directed worldwide market development programs for a U.S. industry exporting 70 percent of its annual production. In this position he directed market development teams to over 30 countries.

A native of the United States, Mr. Welsh grew up on a livestock and field crop farm in the state of Iowa. He is a graduate of the College of Agriculture, Oregon State University where he specialized in Agricultural and Resource Economics and Animal Science.. He has also studied toward a Master of Science degree in Agricultural Economics at Washington State University.

He is a member of the American Society of Agricultural Consultants International and the American Chamber of Commerce in Thailand.

### Williamm Zappettini, Jr., BBA

Zappettini Consulting Company

2 Lupin Lane

Atherton, CA 94025

USA

(Tel) 415-322-8545

(Fax) 415-322-xxxx

William Zappettini, Jr. is President of Mt. View Industrial Pack, Inc., Millbrae, California, USA, and Chairman and President of the Zappettini Group, due of Atherton, California. Mt. View is a family owned holding company which includes more than 160 acres of nurseries and more than 1.5 million square feet of greenhouse facilities in California producing and distributing roses and other cut-flowers throughout the United States and overseas. The Zappettini Group provides management and consulting services to U.S. and international investments flower production and distribution.

Mr. Zappettini joined the family owned floral business in 1955 and has remained active since. His activities have included the establishment and management of flower production, flower distribution and marketing, commercial Real Estate Holdings, and other family investments. During the period 1985-90 he served as a news commentator for the floral industry for CBS Radio. He has been instrumental in establishing flower production and marketing programs in South America, and is active in the flower markets of Holland.

He is a native of California and is a graduate of the University of San Francisco, specialize in Business Administration. He served as an officer in the U.S. Army.

He is a Certified Agricultural Consultant, and holds memberships in the American Academy of Florists (AAF), The Society of American Florists (SAF), Roses, , wholesale Florists and Floral Suppliers of America and other professional and horticulture organizations.

**ASACI HEADQUARTERS STAFF BIOGRAPHIES**

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**Kelly M. Harrison, Ph.D.**

Executive Vice-President

American Society of Agricultural Consultants, International

8301 Greensboro Drive, Suite 260

McLean, VA 22102

USA

(Tel) 703-893-8303

(Fax) 703-356-2488

Dr. Kelly M. Harrison has been active in international agribusiness development and agricultural product marketing for more than 25 years. Since 1984 he has been President of Kelly Harrison Associates, Inc., a consulting firm specializing in international agribusiness management and trade. The company has been involved in export market development for U.S. agribusiness clients. The company has completed consulting assignments in most countries of the Western Hemisphere as well as Korea and Egypt.

Dr. Harrison is a graduate of Texas Tech University and holds an M.S. from Kansas State University and a PhD. from Michigan State University, all in Agricultural Economics and Agribusiness Management. He spent nearly 10 years on the faculty of Agricultural Economics at Michigan State University where he was a leader in the University's pioneering work on the role of marketing in economic development. He directed AID financed studies on that subject in Brazil, Colombia and Costa Rica. He also taught courses in agricultural marketing and food system management, while consulting in most countries of Latin America.

From 1977 to early 1981 he served as General Sales Manager and Associate Administrator of the Foreign Agricultural Service. He managed several major export credit programs disbursing over \$3 billion annually for export credits to over forty different countries. Also responsible for direct export sales of certain CCC-owned commodities. Activities included policy formulation, high level liaison with Congress and other agencies, international representation, and liaison with constituency and clientele groups.

From late 1988 to mid 1991 he served as Chief of Party for a technical assistance team helping the Jordanian government and private sector make improvements in their agricultural marketing system and expand export markets. He directed extensive research on horticultural market opportunities and competitive conditions in the European Economic Community. That market research revealed large, profitable and well protected market windows for eight winter season fresh horticultural products from Jordan.

**Michael E. Peden, MBA**

(see biography listed in In Country Team Biographies)

## Appendix B

### Cynthia A. Leigh, BGS

International Projects Coordinator  
American Society of Agricultural Consultants, International  
8301 Greensboro Drive, Suite 260  
McLean, VA 22102  
USA  
(Tel) 703-893-8303  
(Fax) 703-356-2488

Currently serving as International Projects Coordinator for the American Society of Agricultural Consultants, *International*, Ms. Leigh has expertise in logistics planning and promotional writing with specific experience in marketing and organizational promotion. She applies computer skills to enhance these activities and has experience working in an international environment.

Prior to joining ASACI, Ms. Leigh served as Supervisor of Marketing and Information Systems for the Spain '92 Foundation -- an arm of the Spanish government operating as a non-profit organization headquartered in Washington, DC. She created a national outreach program, served as Mailing and Circulation Adviser to a new monthly magazine, wrote and designed public information and management materials and created a custom computer database system for project tracking.

In 1985, Ms. Leigh worked for The Cousteau Society in New York as Production and Special Event Coordinator where she directed the Cousteau staff in participating in a 2,000-person televised dinner honoring Captain Cousteau and served as the Production Coordinator for a two-hour television special, "Jacques Cousteau: The First 75 Years."

Ms. Leigh began her career as an Administrative Assistant in 1973 with Mutual of Omaha's Public Relations/Government Liaison office in Washington, DC. From 1977 to 1985 she served as representative for the Executive Vice President on Planning Committees for more than 30 public affairs events. The majority of projects involved fund-raising and promotion for nonprofit organizations netting from \$10,000 to \$1 million. Promotions represented included serving on the Planning Committee for the annual fund-raiser for "USO Woman of the Year" dinner honoring Mrs. George Bush, Barbara Mandrell and Elizabeth Taylor and Member of the Event Staff for the "Bob Hope Celebrity Special."

Ms. Leigh has a Bachelor of General Studies degree from The American University, Washington, DC. The degree includes completion of an Advanced International Business semester at The University of Copenhagen during which time she traveled extensively for field studies to Western and Eastern Europe and Scandinavia. She has begun work toward a Master's Degree in International Communications at The American University.

*AGRIBUSINESS INVESTMENT IN THE  
KINGDOM OF THAILAND*

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INTRODUCTION

In 1984 the U.S. Agency for International Development's Agricultural Technology Transfer Project (ATT) began. The Project is designed to assist the Royal Thai Government to introduce appropriate new technology to increase the quality and value of exports, reduce imports, and maintain positive growth rates for the agriculture sector. The purpose of the ATT Project is to accelerate the Royal Thai Government's and the private sector's capacities to identify, introduce, and manage the modern agricultural technology needed to increase yields, production, incomes and product value and quality.

In 1989, the USAID Bureau of Asia, Near East and Europe (ANE) approved a new strategy for its assistance for the agriculture sector. The strategy entitled, "Food Systems Strategy for the 1990's" includes a major focus on agribusiness. In November, 1989, the USAID Asia Near East Bureau awarded a five-year institutional support grant to ASACI to assist in the implementation of the Strategy on a regional basis. ASACI is responsible for implementation of the agribusiness element of the USAID ANE Bureau strategy.

The purpose of the Cooperative Agreement/Grant between USAID and ASACI is to provide resources to assist the Royal Thai Government Ministry of Agriculture and Cooperatives, and appropriate other Thai Government agencies and Thai private entities concerned with trade and investment, in realizing the potential for

commercialization by agribusiness resulting from activities funded by the ATT Project. Maximum commercial use of the results of the ATT Project will require increased and new investment by agribusiness.

The objective of expanded U.S. and Thai investment in agribusiness activities is consistent with a major element (trade and investment) of the Memorandum of Understanding between AID and the Royal Thai Government, "Advancing Mutual Interests in a Rapidly Changing International Environment."

Working under this Cooperative Agreement/Grant, the American Society of Agricultural Consultants International (ASACI) structured an Agribusiness Assessment Team to begin the first component in their "Integrated Agribusiness Development Program for Modern Food Systems." This component calls for an in-depth analysis of the agribusiness and general business climate and early identification of potential agribusiness projects in Thailand for prospective U.S. investors.

To prepare this Investment Promotion Report, a three-person advance team first studied pertinent data available from U.S. sources, reviewed interest of potential investors listed in the ASACI database, and then traveled to Thailand from July 30 - August 26, 1991, to conduct interviews, make on-site inspections, and gather first-hand information.

Taking the stance of a potential U.S. investor, team members assessed the investment climate, analyzed the agricultural sector, and made a preliminary evaluation and selection of prospective project opportunities.

In the second phase of ASACI's "Integrated Program", a follow-up team of 5 ASACI consultants reviewed the Agribusiness Assessment Report and began work on the Project Profile Component in early November, 1991 in Thailand to further evaluate and select those prospective ventures of highest potential interest to U.S. investors.

The investment promotion document, upon review and approval by USAID/Thailand, will then be made available through the marketing network of ASAC members to selected U.S. potential investors. Other prospective investors and interested parties may obtain this report at a nominal cost by contacting ASAC headquarters at the following address:

**American Society of Agricultural  
Consultants International  
8301 Greensboro Drive, Suite 260  
McLean, Virginia 22102**

**703-893-8803 (Tel)  
703-356-2455 (Fax)**

Although secondary data sources were important, the most vital information on the potential for U.S. agribusiness activities contained in this Report was obtained by one-on-one meetings and interviews with Thailand private sector agribusiness owners, operators, managers and entrepreneurs who are assuming the profit/loss risk in operating an agribusiness venture. This information from business people on the firing line was given considerable weight in developing the assessment of the Thailand agribusiness climate.

Secondary data sources such as the Foreign Economic Trends Report, U.S. Department of Commerce, Country Report: Thailand, the Thailand Board of Investment, and Economist Intelligence Unit revealed that the general investment climate in Thailand is excellent and improving rapidly due to recent government measures directed at establishing a more free market economy and business climate with extensive enhancements for international investors. To facilitate follow-up on assessment information, this Report lists potential Thailand partners interviewed by team members, as well as other valuable contacts in the Thailand business and agribusiness sectors.

## COUNTRY BACKGROUND

### GEOGRAPHY

Thailand has an area of approximately 517,000 square kilometers, which is slightly smaller than the State of Texas or about the size of Spain. The elongated shape of the country makes the north to south distance about 1,860 kilometers. Distances in any other direction are substantially less. Bangkok is located at the center of the country, or approximately 14 degrees north latitude, which generally places it on the same level as Manila, Guatemala, and Khartoum. Topographically, Thailand may be divided into four major regions:

The central region where the soil is fertile and the Chao Phraya River network is a dominant factor.

The north-east plateau, which is approximately 300 meters above the central plain region and is the poorest region because of having a thin soil and periodically plagued by droughts and floods.

Northern Thailand is comprised of mountains and fertile valleys. The southern peninsular region which extends to the Malaysian frontier and is primarily rain forest.

The southern region receives the most annual rainfall and the northeast region the least rainfall. The climate of Thailand is controlled by monsoons, which results in three distinct seasons: the rainy season from mid-May until October, a cool and dry season from November until February, and a hot period which begins in March and extends through May. The southern region receives more rain for a longer period of time than other parts of the country and is subject to two monsoons. This makes the wet season essentially last through January. The temperature range is more even year-round in the south. The northeast plain is subject to the highest temperatures during the hot season where the daytime temperature easily reaches 39 degrees Centigrade and is only a few degrees lower at night.

Most of Thailand is very humid with the northern mountains being the exception. Temperatures drop as low as 13 degrees Centigrade at night during the cool season in Chiang Mai and even lower in Mae Hong Son. Central Thailand receives most of the rains during August and September but has experienced flooding during October because the soil has become totally saturated by that time.

Bangkok experienced the most severe flooding in 30 years in 1983 when virtually all of the city was under several feet of water. The northern region receives slightly less rain than the central region. August is the peak of the rainy season. The northeast receives less rain than other parts and periodically suffers droughts. In Ranang, it rains most frequently. In May, rainfall averages 21 out of 30 days, and in October rainfall averages 22 out of 30 days.

## HISTORY

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With a history dating back to 650 A.D., the Thai people originated in Southeastern China with the development of the Kingdom of Nanchao. This civilization lasted for more than 500 years.

The Thai people repelled invasions and refused to be incorporated into mainstream Chinese culture. However, these intrusions forced the Thai people to the South to what is now known as Thailand.

The Thai migrants joined together and formed a capital city at Sukhothai in the 13th century. Although other civilizations had existed on Thai soil much earlier, Sukhothai was the first sovereign capital of Thailand. It prospered for over 100 years during which time Thai customs, culture and architecture styles were developed. This paralleled the establishment of the northern Lannathai kingdom by King Mengrai in approximately 1296. Chiang Mai was the center of the kingdom.

During the mid-14th century, a new dynasty developed at Ayutthaya, approximately 85 kilometers north of present day Bangkok. This new city on the Chao Phraya River prospered and absorbed the Kingdom of Sukhothai. It remained the capital of Thailand for 417 years. Ayutthaya systematically grew and prospered until 1767 when it was taken over by the Burmese. One of the key factors which made the Ayutthaya a progressive period in Thailand's history was the establishment of diplomatic relations with the West and trading agreements with the European powers of that period.

Ayutthaya survivors fled south and formed a new Thai capital at Thonburi under the leadership of King Taksin. They were eventually successful in reclaiming Thai lands which had been lost to the Burmese. Taksin died in 1782 and was succeeded by Chao Phraya Chakri as Rama I, the first of the present Chakri dynasty. Under his rule, the capital was moved across the Chao Phraya River to the present site of Bangkok.

Under Chakri dynasty rule, Thailand's borders have been integrated and all parts of the country have been brought under central government rule. Rama V, who ruled from 1851 to 1868, secured relations with the West, particularly France and Great Britain. Thailand maintained its independence during this period when many of its neighbors were colonized by European countries. During the reign of Rama VI (1868 to 1910), many social and political reforms prepared Thailand for the 20th century.

Thailand was ruled by an absolute monarchy through the reign of Rama IV and into the period of Rama VII (1925 to 1934). As a result of a 1932 coup d'etat, the government of Thailand was changed to a constitutional monarchy. Rama VII abdicated the throne two years after the coup. He was succeeded by King Ananda Mahidol who became Rama VIII and ruled until 1946 when his brother, King Bhumipol or Rama IX, became the monarch and continues to hold that position today.

Since 1932 Thailand has been a constitutional monarchy. However, the King is held in great standing and supported by the Buddhist religion. This religion composes over 90 per cent of the Thai population. The King, Bhumibol Adulyadej (Rama IX), is one the most resolute advocates for democracy. Considering the reverence that the people of Thailand have for the King, it is assumed that a democratic agenda is being developed and nurtured.

Thailand is governed by the military, which overthrew the democratically elected government in February of 1991. Then Prime Minister, Chatichai Choonhaven, was removed from office in a bloodless coup. However, business in Thailand goes on with little or no disruption.

With the support of the Royal Family, a civilian government of respected leaders has been installed, a new National Assembly has been appointed, a new constitution is being developed and elections are scheduled by March, 1992. However, the investor must take a "see to believe" stance in this matter.

The newly appointed Prime Minister, Anand Panyarchun, has put together a highly respected cabinet of technocrats, businessmen and military officers. With the appointment of Mr. Panyarchun, Thailand has seen a renewed effort to develop business linkages with the U.S.

#### GOVERNMENT

The Kingdom of Thailand is designed as a Constitutional Monarchy and operates as such most of the time. At this time a new permanent Constitution is being developed. Under this edition the King is Head of State. Sovereignty is derived from the people and exercised by the King through the National Assembly, and the Council of Ministers, which is consistent with the Constitution.

All statutes are formally developed in the name of the King after the granting of Royal Assent to a bill passed by the National Assembly. Statutes usually express principles and leave details to Royal Decrees and Ministerial Regulations which are implemented by the government and do not require formal action by the legislature.

The National Assembly is the bicameral legislative division of the Kingdom of Thailand and is made up of the Senate and House of Representatives. The Senate is appointed by the King. Senators serve a six-year term and may be reappointed at the pleasure of the King. The House is popularly elected and serves four-year terms. However, a discerning fact to the investor is that the King may dissolve the House and call for re-elections.

Proposed bills are introduced either by the Council of Ministers or by members of the House of Representatives. Bills relating to money must be presented by the Council of Ministers or a member of the House with the approval of the Prime Minister. After approval of a bill by the House, it is then sent to the Senate for action. If the bill is approved by the Senate or no action is taken, then the bill is considered passed. The House is empowered to override a Senate veto in case of conflict. Thailand's basic legislation is codified in the Civil and Commercial Code, Land Code, Penal Code, Criminal Procedures Code and Revenue Code.

The Council of Ministers, headed by the Prime Minister, is charged with administration of the Kingdom of Thailand. The Council and Prime Minister are appointed by the King, subject to approval by the President of the National Assembly. Ministers are subject to recall by the King.

#### GENERAL ECONOMY

Thailand maintained a steady GNP rate during the 1980's which exceeded 10 per cent per annum by 1987. It is on the periphery of attaining the ranking of NIC (Newly Industrialized Country), which should be realized within the next decade. Thailand will be joining forces with South Korea, Taiwan, Hong Kong and Singapore in becoming a leader in the Pacific Rim economic boom.

It is projected that by 1992 more than half of Thailand's labor force will be employed in some segment of manufacturing or industry. Presently, about 60 per cent of Thai labor is engaged in agriculture, 10 per cent in commerce, 10 per cent in service jobs and 8 per cent in manufacturing. Thailand's major exports are rice, tapioca, sugar, rubber, maize, tin, pineapple, tuna, textiles and electronics. Manufactured goods have become an increasingly important source of foreign exchange earnings and now account for 60 per cent of Thailand's exports.

Tourism is presently the leading source of foreign exchange. Nearly five million tourists spent 57 billion baht (over \$2 billion U.S.) in 1988. The government economic design remains focused, however, on export growth through the development of light industries such as textiles and electronics backed by rich reserves of natural resources and a large labor force. Economists predict that a broad-based economy will make Thailand a major economic competitor in Asia in the long term. Thailand also has the lowest foreign debt in Southeast Asia -- just 20 per cent of the gross domestic product.

Average per capita income by the end of the 1980's was US\$880 per year.

Regional inequities, however, mean that local averages range from US\$300 in the northeast to US\$2,300 in Bangkok. The current inflation rate is approximately 5-6 per cent per annum.

The northeast of Thailand has the lowest inflation rate and cost of living. This region is poorer than the rest of the country, and handwoven textiles and farming are the primary means of livelihood in this area. In the south, fishing, tin mining and rubber production keep the local economy fairly stable. Central Thailand grows fruit (particularly pineapple), sugar cane and rice for export and supports most of the industry (textiles, food processing and cement). North Thailand produces mountain or dry rice for domestic use, maize, tea, various fruits and flowers and is heavily dependent on tourism.

Teak and other lumber was once a major product of the north; but, since early 1989, all logging has been banned in Thailand in order to prevent further deforestation. Current regulations prohibit logging of teak or clearing additional mangroves, but enforcement is weak.

Several egregious encroachments on national forest lands and protected mangrove areas have generated strong negative publicity and highlighted the need for stronger regulations and enforcement.

#### HUMAN RESOURCES

The agribusiness investor in Thailand will find the labor force to be a major asset. Thai labor costs are reasonably priced, and the workers are interested in learning and developing on the job.

Some sources indicate the Thai labor force is capable of high levels of dexterity and when properly trained can produce at a high level of productivity. With a 90 per cent literacy rate, Thailand is among the prominent developing countries in compulsory education. Education is mandatory until age 15.

The Thai government has set a minimum daily wage range from 61 baht to 73 baht, depending on location and type of job. The potential investor can expect to pay the following monthly wages:

- Unskilled Workers \$80 +
- Skilled Workers \$160-\$200
- Middle Management \$400

The cost effectiveness of utilizing Thai workers is a strong competitive advantage as compared to U.S. workers and other Asian workers in the region. Vocational and Training schools are turning out potential candidates for work in the agribusiness industry. ASACI expects these workers to play an ever increasing role in development of the private agribusiness sector.

#### RURAL EMPLOYMENT, MIGRATION, AND WAGES

Thailand's population is over 55 million, with approximately 58.4 per cent being in the rural work force. Being 95 per cent Buddhist and living in a loosely structured hierarchal society with a royal family at the top, very few racial, religious, or other tensions are prevalent. The minimum wage is officially about US\$4.00 per day. Agricultural workers commonly receive US\$2-3.00 on a day labor basis.

Population growth reportedly has been stabilized to 1.9 per cent annually throughout the country. Migration to urban areas has been significant during the past 10-20 years as would be expected with a fast growing economy. Gross National Product increased from 1980's US\$11.98 billion to US\$20.5 billion by 1988 -- followed by 1989's US\$22.7 billion. Approximately 58 per cent of the work force accounts for just 16 per cent of GNP. Strong emphasis from the Board of Investment on encouraging agricultural development via joint ventures and other means is seen by the government as being a key element in minimizing social and political dislocations.

Most business representatives interviewed agree that both the labor work force and farmers are generally trainable, although often bound by tradition. Agricultural production technology is transferable, which is verifiable by the predominance of large, modern installations in the poultry and swine production sectors. Labor protection is provided by regulations include medical leave up to thirty working days per year, maternity leave, worker's compensation severance pay, plus codes governing unfair dismissals.

Government spokesperson point with pride to a 90 per cent literacy rate as concrete evidence of employee and farmer trainability. However, the definition of "literacy" most likely relates to U.S. sixth or seventh grade equivalency.

LAND TENURE AND REFORM

About Sixty percent of Thailand's total population of about 55 million people are engaged in some form of agriculture. Approximately 10 per cent of the population resides in Bangkok. Agriculture represents about 15 per cent of the country's Gross National Product estimated by the Board of Investment to be US\$60 billion in 1991.

Land holdings are typically small and in the range of 0.5 to 25 acres. A relatively small number of 500 to 2,000-acre holdings exists even though no government restrictions prevent ownership of large sections of land. In addition, government ownership of state enterprises (parastatals) having large tracts also exists, although the official position stresses reduction of government involvement in competing with free enterprise.

Still, the small-holding land ownership pattern presents a major problem in planning the development of large, land oriented, agro-industrial business ventures which require significant amounts of contiguous, good quality land. Acquisition difficulties are also complicated by the fact that many farmers and other land owners do not possess clear title to their land. Long-term leases are often used as a practical substitute for ownership.

Approximately 20 per cent of Thailand's farmers participate in cooperatives that typically have local memberships of 500 to 1,000 individuals. Most co-op members are smaller producers except where contractual joint ventures with private companies have been developed.

COMMUNICATIONS

The Telephone Organization of Thailand (TOT) and the Communications Authority of Thailand (CAT) are the two government organizations that provide telecommunication services in Thailand. CAT furnishes services via satellite and marine cable to other countries of the world. At the time of this Report, there is direct dialing to over 30 countries, including the United States. The services of CAT also include facsimile, leased/rented services, telex/ telegraph and, as of late, mobile and radio telephone services.

The domestic services of TOT deal primarily with in-country services and truck line services to Burma, Laos, VietNam, Malaysia and Singapore. TOT personnel estimates that 1.2 million lines have already been installed with an expected .8 million more for a total of 2 million lines by 1992.

The undersupply of regular telephone capability has led to the major popularity of portable/mobile telephones. In late 1986, mobile telephone service was started, and TOT is expected to have approximately 18,000 lines in operation by the end of 1991.

The major problem faced by the telephone infrastructure is the slow pace at which new line capacity has been installed. The number of lines per 100 population is only 1.9 (compared to 9.7 in Malaysia, 30 in Korea, 46 in Singapore), and the waiting time for a new installation can be years. The total line capacity in Thailand is currently only about 1.2 million, and this lack of services has retarded some business development.

The Royal Thai Government has approved a private concession for approximately \$3 billion to install an additional 2 million lines in Bangkok. New lines will be added at about 500,000 per year. Another concession for the installation of 1 million lines in the areas outside of the capital is planned. Other services such as satellite communications, cellular phone and paging services, and fiber optic trunk lines are undergoing rapid growth. While communications infrastructure will still be inadequate for several years, there is reason to believe that privatization of services will greatly speed up the provision of both basic and advanced telecommunications services.

### ROADS

Thailand has approximately 80,000 miles of roads and highways with 8,000 miles of major traffic routes that connect Bangkok with the provinces. One major artery is the Asian highway that reaches from Thailand's northern provinces, south through Bangkok, and continues on across the Thai-Malaysian border, through Malaysia and terminates in Singapore.

There appears to be sufficient surface transportation to handle agribusiness operations in most parts of Thailand. Of course, as with any developing country, there are areas where the transportation sector will not handle agribusiness needs without upgrading. This is an area that can be discussed with the government prior to location of operations. Traffic in Bangkok (population 6.7 million) will have to be seen to be believed. There is a common saying in Thailand, "Thailand does not have to be concerned about being invaded -- the invaders would be trapped in the Bangkok traffic and never be seen again."

The traffic pattern is British where driving is on the left side of the road and all vehicles are right-hand drives. There are almost no American automobiles or trucks. Japan, German and French manufacturers dominate the automotive market.

Thailand is focusing on several areas of major enhancement of the land transport sector:

- Linking the capital of Bangkok with the eastern seaboard, in line with the governments privatization and decentralization directives.
- In the south, work is being done with the "Southern Seaboard" project.
- Work is planned for Bangkok to reduce traffic congestion.

### RAIL

The State Railway of Thailand (SRT) operates approximately 2,000 miles of track to approximately 600 destinations. There are four main routes that radiate from the capital of Bangkok. These routes lead to the north and Chaing Mai, Nong Kahi in the northeast, east to Prachinburi and south to Singapore.

SRT has extended routes from Bangkok to reach Sattahip, a deep water port in the Eastern Seaboard district. Railways generally are non-electrified with motive power from diesel prime movers. There appears to be a combination of European, Asian and U.S. rolling stock. Passenger trains are quite acceptable and offer a low-cost method of quality transportation to the businessman.

WATER

A main source of transportation, Thailand has over 2,500 usable inland waterways which are managed by the Ministry of Communications (MOC). Approximately 500 miles are usable for transportation of heavy cargo such as rice. However, in the dry season the amount of waterways usable by heavy vessels is often less than 250 miles. The MOC reports that an average of 900,000 tons of goods are handled annually on these waterways.

In regard to ocean access, Thailand has over 1,200 miles of coastlines on both the Gulf of Thailand and the Andaman Sea. Separate sea lanes have been established for both fishing and transportation. A total of 40 operational seaports and 90 fishing piers dot the southern coast of Thailand. Most seaports are operated by the private sector and have inadequate facilities.

The Port Authority of Thailand is a government agency charged with the responsibility of overseeing the major ports in the country. The major ports are located at Klong Toey, Sattahip, Songkhla, Phuket and Laem Chabang.

Klong Toey Port at Bangkok is the largest port in Thailand. It is in close proximity to Bangkok's business and commercial nucleus. Klong Toey Port contains 10 wharfs for general cargo and numerous berths to handle container ships and semi-container and conventional cargo ships. The facility also includes piers used for barges and 18 privately owned wharfs.

The facility may efficaciously accommodate ships of up to 12,000 gross tons. Larger ships unable to navigate up the Chao Phaya River find it necessary to load and off-load on the landward boundary of Sichang Island off the Chonburi coast. These vessels are then assisted by seagoing tugboats and barges. As a result of rapid industrial growth during the past decade, Thailand's ports have been unable to keep pace with the increased demand.

Congestion is increasingly becoming a problem at Klong Toey Port. The Port Authority of Thailand has developed a strategy to help alleviate some of the congestion, which includes rearranging hauling systems for import containers, re-allocation of unused space, improving land traffic and promotion of the diversion of traffic to the port of Sattahip, which is nearby.

The port of Sattahip, a deep-sea port, was previously a military facility used by the Royal Thai Navy. In 1979, it was taken over by the Port Authority of Thailand and developed into a commercial port. It has the facilities for loading and off-loading containerized and general cargo. Sattahip is located approximately 200 kilometers from Bangkok and is under utilized at the present time, but steps have been taken to reduce container rates in order to negate the increased transportation cost to Bangkok.

Other deep-sea ports are located in the south at Songkhla and Phuket and on the Eastern Seaboard at Laem Chabang.

Songkhla may accommodate both general and containerized cargo, whereas Phuket may accommodate general cargo ships. Laem Chabang is located in the province of Chonburi and is the newest of Thailand's ports. It can accommodate both containerized and general cargo.

Figure 11

Electricity Capacity and Demand : 1991-1996				
End of Fiscal Year	Capacity Increase (MW)	Installed Total (MW)	Electricity Demand (MW)	Reserve Margin %
1991	1,940	9,939	8,260	19.2
1992	917	10,827	9,029	15.5
1993	1,242	12,069	9,825	18.6
1994	906	12,947	10,689	17.1
1995	923	13,870	11,498	15.8
1996	1,000	14,836	12,335	15.6

There are approximately 48 shipping firms in Thailand. The government is a major shareholder in two of the companies. The shipowners association is enterprising and supported by the Board of Trade. Bangkok International Airport is located on the outer periphery of Bangkok and approximately a 45-minute drive to the central business district. It plays a major role in Southeast Asia's aviation circuit. Airports Authority of Thailand, a government agency, is assigned the responsibility of managing the airport.

Bangkok International Airport is served by over 50 international airlines including Thai Airways International, the national airlines. As a result of a recent expansion program, the Bangkok International Airport can now accommodate approximately 3,300 incoming passengers and 4,300 outgoing passengers per hour.

To meet the increasing need for air exports, an air cargo park was recently constructed. Projected capacity for the new facility is approximately 400,000 tons of air cargo annually. Additional cargo facilities are now being planned with the anticipation of Bangkok becoming a regional center for cargo transport.

There are 23 domestic airports in addition to the Bangkok International Airport throughout Thailand. These airports are managed by the Commercial Aviation Department. International airports include Khon Kaen in the northeast, and major international airports at Chiang Mai in the north and Phuket in the south. Both Chiang Mai and Phuket have major cargo facilities.

#### ELECTRICITY

The parastatal Electric Generating Authority of Thailand provides power for the country. The current is 220 A.C. volts, 50 cycles. Wall plugs vary and are the two-pronged European type. Electrical transmission lines cover most of the nation and the supply is dependable. The Authority forecasts that more than 11,000 megawatts will be generated in 1991. ASACI found the power in Bangkok to be relatively smooth and free from major "spikes" and "noise." (see Figure 11)

#### LAND AND WATER RESOURCES

The Kingdom of Thailand's political divisions include 72 provinces divided into 3 to 19 districts, each typically made up of 2 to 10 subdistricts. Each subdistrict contains up to 15 villages. Residing in each village are 100 to 500 families.

Thailand's total land area is approximately 51.3 million hectares or 112.9 million acres. Approximately 37 per cent of the available land is currently involved in some type of agricultural activity.

Water availability ranges from plentiful along the Mekong River in the northeast to significantly low in the central, western and, northeastern zones. Climate is particularly important to water resources in Thailand since surface water is the main source of water used. Thailand's major water basin is the Chao Phraya which covers 35 percent of the nation, including most of the north and central areas (930,300 MCM annually). Other major river basins are the Mae Klong (13,400 MCM), the Mun (28,600 MCM), the Tapi (11,000 MCM), and the Mekong (5,500 MCM).

Approximately 50 percent of surface runoff is captured and stored along major streams with large reservoirs and distribution systems to serve irrigation and hydropower. There are thousands of other smaller storage facilities (confinements of 1,000 to 12,000 hectares) that serve the agricultural needs of groups of farms and small irrigation districts.

Agricultural practices, industrial development, and human waste from an expanding population (1.6 percent per year), have led to rather widespread problems regarding both surface and subterranean water pollution.

The need for additional water in Thailand relates to several factors: rapid growth in water use due to transition of agriculture to industry, shift from rural to urban population, shift from subsistence to cash crop agriculture, decreasing water quality, significant spatial differences in rainfall climate, and excessive water evaporation. Lack of effective regulatory and management techniques also contribute to additional water needs.

Areas for improvement include waste disposal, loss of storage due to silting and lack of maintenance, over-pumpage of groundwater giving rise to subsidence of Bangkok and resultant poor drainage and flooding, non-optimal management of water at large scales and at district or irrigation scheme scales and at individual farmer scale, no charge for agricultural water leading to its inefficient use, and lack of water use laws and regulations.

Specific water needs are geographically distinct. The first is the central plains area to which Thailand's economy is strongly tied and where additional water would be of great benefit. The central plains irrigation needs are supplied by major reservoirs which have multiple purposes -- to handle the floods from tropical storms, provide water for urban areas, dilute lower river pollution and generate hydroelectric power (15 percent of Thailand's supply). The irrigated areas in the central plains represent only 15 percent of the nation's agricultural lands, yet produce nearly 50 percent of the crop value.

The second area is the northeast region where average rainfall is the lowest in Thailand. Rainfall agriculture predominates in this region, which contains one-third of all Thai farms. This area has many low moisture capacity soils; and, when irrigated, often develops salinity problems.

#### National Development Strategy

In 1987, Thailand began the Sixth Five-Year National Economic and Social Development Plan (1987 to 1991). The Plan for the next period (1992 to 1996) has just been released and seeks to improve on the economic performance from the Sixth Plan.

According to Board of Investment figures, the growth rate of 4.9 per cent during that period was almost double the world rate. To develop a higher rate, the Government of Thailand has targeted three main areas for development strategy utilization. Obviously, these objectives are general; however, they have a direct impact on the agribusiness sector and, subsequently, investment development.

Noted below are the objectives as summarized and noted in discussions with Dr. Atachika Brimble of the Thailand Board of Investment:

Increase efficiency by improving human resources, promoting science and technology, conserving natural resources and optimizing management and administrative systems.

Improve manufacturing systems, marketing systems, and infrastructure support in order to boost industrial and agribusiness activity and development.

Increase social equality by distributing income and progress to develop low-income areas in an effort to reduce economic disparity between urban and rural regions.

Dr. Brimble noted that the Five-Year Plan has placed more emphasis on export promotion, and private sector development has been given a leading role with government taking the supporting role.

#### EDUCATION

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The past few years have been a period of rapid growth and expansion in the higher education system in Thailand. During this time, the Rathchamongkol Institute of Technology, and other private and public vocational schools, have been elevated to the tertiary rank.

Education is mandatory through grade 6, and plans are to increase compulsory education to grade 9. There is currently a disappointing level of secondary enrollment, especially in rural areas, and technical/vocational training is sometimes not closely linked with the manpower needs of industry. University education is coming under increasing pressure to produce more of the skills needed by the marketplace and to reform operating systems to attract and retain highly skilled faculty. Recent trends indicate that the non-formal and higher educational systems are improving and will be better prepared to meet the demands of industry.

The higher education system in Thailand has been designed to closely emulate the system used in the United States. An Associate's Degree or diploma is awarded after three years of study in a Bachelor's Degree program; Bachelor's Degrees require at least four years followed by a Master's Degree which generally requires a one-year program. Doctoral Degrees are offered in a few fields. Thailand presently has 20 government and 23 private universities or campuses. (See Table 27, Higher Education Institutions in Thailand). Numerous private and public vocational schools provide a variety of programs.

Vocational training programs offer three levels of qualification that require years of course work. The lowest level is a Certificate of Vocational Education, which is presented to students who complete three years of training in a program beyond completion of secondary school (9 years of school). Other certificates, Advanced Certificate of Vocational Education and Higher Certificate of Vocational Education, require additional years of study.

The total number of students who graduated from vocational schools in 1988 was approximately 150,000. About 50 per cent of the students received certificates in technical fields and the remaining 50 per cent were in business fields.

## COUNTRY RISK

Recently Thailand has been in the top ten of countries with the largest inflows of foreign direct investments, as noted in the table below, East, South and Southeast Asia has been the highest since 1985.

Table 27

Higher Education Institutions in Thailand	
Type of Institution and Degrees Offered	Number of Institutions/Campuses
<b>Government Universities</b>	16
Doctoral Degree	
Masters Degree	
Post-Graduate Certificate	
Bachelors Degree	
Diploma	
<b>Private Universities</b>	23
Bachelors Degree	
Diploma	
Higher Certificate of Vocational Education (P-V-S)	
<b>The Ratchamongkol Institute of Technology</b>	28
Bachelors Degree	
Advanced Certificate of Vocational Education (P-V-T)	
Higher Certificate of Vocational Education (P-V-S)	
Certificate of Vocational Education (P-V-CH)	
<b>Government Vocational Colleges</b>	202
Advanced Certificate of Vocational Education (P-V-T)	
Higher Certificate of Vocational Education (P-V-S)	
Certificate of Vocational Education (P-V-CH)	
<b>Private Vocational Colleges</b>	363
Advanced Certificate of Vocational Education (P-V-T)	
Higher Certificate of Vocational Education (P-V-S)	
Certificate of Vocational Education (P-V-CH)	

Political instability, limited track records and poor statistics make gauging risk a risky business. According to the September 20, 1991 Wall Street Journal, two "risk-raters" try.

The two risk-raters:

Economist Intelligence Unit (EIU), a New York-based subsidiary of The Economist Group, London. A rating of A, or 0-20 points, is the least risky. That's followed by B, 25-40 points; C, 45-55 points; D, 60-75 points; and E, 80-100 points.

International Country Risk Guide (ICRG), put out by a U.S. division of International Business Communications, Ltd., London. ICRG offers a composite risk rating, as well as individual ratings for political, financial and economic risk. The political variable-which makes up 50 percent of the composite figure-includes factors such as government corruption and how economic expectations diverge from reality.

The ratings break down into three categories: medium-term lending risk, covering such factors as external debt and trends in the current account, with a maximum score of 45 points; political and policy risk, including factors such as the consistency of government policy and the quality of economic management, with a maximum of 40 points; and short-term trade risk, including foreign-exchange reserves, with a cap of 15 points.

The financial rating looks at such things as the likelihood of losses from exchange controls and loan defaults. And economic ratings take into account such factors as inflation and debt-service costs.

The maximum, or least risky, score is 100 for the political category and 50 each for financial and economic risk. For the composite score, 85-100 is considered very low risk; 70-84.5, low risk; 60-69.5, moderate risk; 50-59.5, moderately high risk; and 0-49.5, very high risk.

Thailand is perceived as one of Asia's most attractive investments!! Economic growth is strong, wages are relatively low, and the government is hospitable to foreign investment. The country is once again under military rule after a brief period of democracy.

The infrastructure is under some strain because of the economic boom, which reflected a major restructuring in 1984. EIU gives Thailand a score of 25, putting it in the B category. Political risk drags down the score. ICRG. give Thailand a score of 68, ranking it 40th. financial risk is scored at 57, financial risk at 42, and economic risk at 37. According to the Global Ranking, Thailand is in the top one-third countries on overall risk.

## TAXATION

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A progressive personal income tax is levied on net income ranging from 5 percent to 50 percent. Taxation starts at 5 percent for \$2,000 equivalent and peaks at \$80,000. For non-residents, only income earned in Thailand is taxable after standard deduction of expenses.

Business tax is a gross receipts tax levied on specific categories of business. Taxation on sale of goods range from 1.5 to 50 percent but other agribusiness areas peak at 10 percent. An additional surtax of 10 percent of the business tax is imposed as a municipal tax.

On January 1, 1992, a value added tax (VAT) will replace the current business tax. This major change is designed to eliminate the double taxation and to promote investment and export. The VAT must be collected at the rate of 10 percent of value added on sales of goods or services at each stage of production and submitted each month.

## INVESTMENT FINANCING

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The International Finance Corporation (IFC), an independent member of the World Bank Group, is the largest source of direct project financing for private investment in developing countries. The Regional Office is in Bangkok.

IFC helps to structure financial packages appropriate to a venture and its risk profile. In addition to project financing, IFC acts as a catalyst, bringing in other lenders, shareholders and coordinating financing from foreign and local banks, export credit agencies and other institutions. IFC can invest up to 35 percent of the share capital for a venture, so long as it is not the largest shareholder.

However, the loan and equity investments that IFC makes for its over account are usually limited no more than 25 percent of project cost. IFC normally invest in ventures costing at least \$4-6 million.

IFC only approves ventures that have realistic prospects of being profitable and that will benefit the economy of the host country.

With a high costs per project, IFC does on-lending (agency lines) to local banks. At the present, two banks have \$5 million for equity. The Siam Commercial Bank can invest \$0.5 to 1 million and the Thai Farmers Bank can handle equity up to \$0.5 million.

Also, the Bank of Asia has \$20 million for at least 8 investor for \$2.5 million or less. This co-financing on a 50-50 basis is provided at LIBRO + 1/2 percent.

The Bank for Agriculture and Agriculture Cooperatives (BAAC) lends money to agricultural projects. BAAC lends to small and medium-sized farmers, as well as to integrated agriculture development projects involving joint ventures and other schemes within the private sector.

Government policy requires all commercial banks to loan a minimum of 5 per cent of their loan portfolio and 20 per cent of total deposits to agricultural rural industries and agribusiness with at least 14 per cent going to farmers and rural industry. Another relevant financing body is the Industrial Finance Corporation of Thailand (IFCT), a quasi-government institution that provides financial services and marketing assistance. Small, medium and long-term loans are made up to ten years by IFCT to private sector businesses on a project basis. Equity investments are also available.

## AGRIBUSINESS ENVIRONMENT

### Political, Economic, and Social Stability

Thailand is stable!! There is little question that the country enjoys a political and economic stability which is reassuring to American investors. Thailand has never been colonized and has maintained a continuous existence for over 700 years. Therefore, Thais have few reservations about dealing with foreigners. Other factors which have helped Thailand maintain stability is the national religion of Buddhism, individual respect for the Monarchy and personal freedoms. It is said that Thailand does not suffer from malnutrition or from excessive unemployment. In fact, Thailand is the fifth leading exporter of food in the world.

One concern that surfaced recently is the "coup" that took place in February of 1991. . However, the Thai people, and particularly the business community, did not "slow down." Thais told ASACI team members that a "coup" is only considered a minor inconvenience and little attention is noted. One Thai businessman stated "business first!"

The interim Royal Thai Government has acted quickly to review vital infrastructure projects and reform tax and other policies to promote a stronger business climate. Plans are for a new constitution to be developed and approved and elections to be held for Prime Minister by the end of March, 1992.

Investment Promotion Policy

Thailand's original investment and promotion laws were articulated in 1954 but have been revised numerous times since then in order to adapt to the growing and diversified economy and investment climate in the country. The Board of Investment was established in 1960 for the purpose of overseeing investment promotions and legislation. The Investment Promotion Act was passed in 1977 and requires the Board of Investment to establish a register of activities which are qualified for promotional favors. These privileges may apply to both domestic and foreign investors.

The Board of Investment is divided into two specific branches. One division establishes policy and makes decisions based on that policy. The other division deals with administration and services.

The Board, the first division, is headed by the Prime Minister. The duties of this division are carried out by select economic ministers and significant individuals from the private sector.

Involvement of the private sector emphasizes the importance of the business population in the economic development and promotion in Thailand. It also assures that policies established by the Board are broad based and well supported. The Board of Investment's implementing agencies include the following from the public sector:

- Office of the Prime Minister
- Department of Labor
- Judicial Council
- Ministry of Commerce
- Ministry of Foreign Affairs
- Ministry of Interior
- Board of Trade of Thailand

- Thai Bankers Association
- Bank of Thailand
- Industrial Finance Corporation of Thailand
- Ministry of Agriculture and Cooperatives
- Ministry of Finance
- Ministry of Industry
- National Economics/Social Development Board
- Federation of Thai Industries

The operational arm of the Board of Investment is the Office of the Board of Investment with the Secretary General serving as the top administrator. The primary responsibility of this agency is to provide support and advisory services to investors in Thailand.

Investment promotion projects are grouped as follows: agro-industries, chemicals, mechanical and electrical equipment, metals and ceramic industries, and services. The Board focuses on projects that generate employment, locate outside the Bangkok and surrounding area, generate export products, utilize Thailand's natural resources, conserve energy and serve as a feeder source for other industries.

In accordance with the Investment Promotion Act, the Board of Investment has the authority to utilize numerous options in order to enhance the investment climate. The Board may accommodate investors with tax incentives such as an exemption period for corporate income tax, import duties, and business taxes. In order to protect Thai businesses from unfair competition from imports, the Board may attach temporary tariff surcharges or place bans on certain imported goods.

Bangkok and the five surrounding provinces have been designated by the Board of Investment as exceptions to the Investment Promotion Zone. Additional incentives are available for projects within the Investment Promotion Zone such as reduction of corporate income tax; deduction of certain operating expenses such as water, electricity, and transportation; and the deduction of infrastructure development. Export-oriented industries may be granted additional incentives.

### GENERAL BUSINESS

Foreign investors who wish to do business in Thailand will find a sensible legal and administrative system in place for establishing a business. The regulations are well established and consistently followed. The most common forms of business arrangements are a private limited company registered in Thailand or a division of a company registered in another country.

A limited company registered in Thailand has very similar characteristics to that of the legal characteristics of a similar company in the United States or Great Britain. All shares of a limited company may be foreign owned, and directors may also be foreigners. Neither shareholders nor directors are required to be in residence in Thailand.

Foreign corporations are not required to obtain special registrations to do business in Thailand. They are, however, required to comply with the Alien Business Law which may have implications for the company based on the type of business activity in which it engages.

The Alien Business Law of 1972 disallows participation in certain types of businesses in Thailand for aliens. The law defines an alien as an individual who is outside the Thai nationality or a corporation in which half or more shareholders are alien, or, half or more shares are held by aliens. The businesses which are restricted by this law are service-type operations such as law, accounting, or advertising.

American investors are generally exempt from the Alien Business law because of a 1968 agreement entered into by the United States and Thailand called the Treaty of Amity and Economic Relations. The agreement is perpetual but may be terminated by either country with one year's notice. The agreement allows businesses incorporated in the United States, or in Thailand and majority owned and controlled by American citizens, to operate on the same level with Thais. The agreement allows for certain exceptions, which Thailand does impose on Americans.

The exceptions disallow participation in certain types of businesses such as transportation, communications, banking which involves depository functions, and domestic trade in indigenous agricultural products. As stated by the Alien Occupation Law, all non-Thai citizens working in Thailand are required to obtain a work permit. Non-Thai's who remain in Thailand for an extended period of time are subject to the Immigration Act. Generally, foreign businesses doing business in Thailand that is beneficial to the country's economy are welcome and do not have a problem with permission to remain in Thailand.

In order to receive Board of Investment endorsement, a company's beneficial contribution to the economic development of the country is evaluated. If it is determined that a positive impact will be made by the business, a contract must be entered into with the Board and the business may be given certain incentives. Because foreign companies cannot be promoted, most promoted companies are private limited companies registered under Thailand's laws. Board of Investment promotion is not required for doing business in Thailand but should be part of the consideration for investors.

Businesses must weigh the benefits gained from the promotions against the concessions required of them. A company which produces goods which will be exported from Thailand will generally be allowed to own all or most of the company, and exemptions from import duty and taxes on imported machinery could be very beneficial. Whereas, a company which produces goods for the domestic market may choose to forego the Board of Investment endorsement because of the Thai majority ownership rule.

#### INVESTMENT PROTECTION

Most countries have government insurance against failure in qualified foreign countries due to certain political problems. The United States has the Overseas Private Investment Corporation (OPIC).

OPIC is a self-sustaining U.S. government agency whose purpose is to promote economic growth in developing countries by encouraging U.S. private investment in those nations. OPIC was created by the Foreign Assistance Act of 1969 to mobilize and facilitate the flow of U.S. capital and skills to friendly countries and areas of the developing world, thereby complementing the development assistance objectives of the United States. OPIC assists U.S. investors in this effort through two principal programs:

- The insurance of investment against certain political risk.
- The financing of such enterprises through direct loans and/or guarantees.

OPIC operates in approximately 100 developing countries around the world. Insurance, financing and other forms of investment assistance are available for new ventures or the expansion of existing enterprises. In each instance, the investment projects supported by OPIC must assist in the social and economic development of the host country and be consistent with the economic interests of the United States.

#### INVESTMENT PROGRAM

OPIC insures investments in qualified projects in less developed friendly countries or areas against loss due to specific political risks. OPIC's statute authorizes it to insure against these risks:

Inability to convert into dollars local currency received by the investor as profits or earnings or return of the original investment.

Loss of investment due to expropriation, nationalization, or confiscation by action of a foreign government.

Loss of income and loss due to political violence, i.e., war, revolution, insurrection, or civil strife.

### CURRENCY EXCHANGE

The following are excerpts on exchange relations in Thailand which were originally published by the Foreign Exchange Department of the Bank of Thailand in the document Exchange Regulations in Thailand, A Guide to the General Public, April 1, 1991:

**Rules and Regulations:** The legal basis for exchange restriction in Thailand is derived from the Exchange Control Act (B.E.2485) and the Ministerial Regulation No. 13 (B.E.2497) issued under the Exchange control Act (B.E. 2485). These laws set out the principles of controls under which, Notifications and Notices that prescribe the detailed procedures were issued.

**Administration:** The Bank of Thailand has been entrusted by the Ministry of Finance with the responsibility of administration of foreign exchange. All foreign exchange transactions are to be conducted through an authorized bank. Authorized persons (money changers) only engage in the purchase of foreign notes and travelers' checks and the selling of foreign notes.

**Prescription of Currency:** There are no special requirements concerning the currency to be used for financial settlements with foreign countries, but payments are generally made in U.S. Dollars.

### BANK DEPOSITS

Foreign Currency Account: Thai individuals and juristic persons in Thailand are allowed to maintain foreign currency accounts under the following conditions:

The accounts are opened with authorized banks in Thailand and with funds that originate from abroad.

The accounts may be withdrawn either for payments of normal business transactions to persons outside the country upon submission of supporting evidences or for conversion into baht at authorized bank.

The total amount of daily outstanding balances in all accounts must not exceed US\$5 million for a juristic person and US\$ 500,000 for an individual.

### TRADE

**Exports:** Exports are free from any exchange restrictions, but export proceeds exceeding 500,000 baht in value must be collected within 180 days from the date of export and surrendered to an authorized bank or deposited in a foreign currency account with an authorized bank in Thailand within 15 days from the date of receipt.

**Imports:** Importers may freely purchase or draw foreign exchange from their own foreign currency accounts for import payments. Letters of credit may also be opened without authorization.

**Transactions on Invisible:** All receipts from invisible must be surrendered to authorized banks or deposited in a foreign currency account within 15 days from the date of receipt.

Payments for invisible such as service fees related to foreign trade, educational expenses or family allowances abroad can be made freely.

#### AGRICULTURAL TRADE

Agriculture accounts for about 15 per cent of Thailand's Gross National Product, and reported in 1991 by the Board of Investment to be near US\$60 billion. Sales volume continues to grow as some other areas develop faster.

Agricultural exports currently represent approximately 20 per cent of total exports -- near US\$22 billion in 1990. Whereas agriculture generated 50 per cent of total exports as late as 1985, the gross amount for all exports that year was a much lower US\$7-8 billion.

The U.S., Japan, Europe, and the ASEAN countries of Singapore, Hong Kong, and Malaysia are Thailand's principal export markets for all types of commercial and agricultural products.

Rice ranks at US\$1.8 billion followed by rubber at US\$1.0 billion, tapioca products at US\$900 million, sugar near US\$700 million, prawns at US\$642.3 million, and, lastly, canned fish. Fish and related preparations represent the leading food-associated import at US\$748.2 million in 1989. Significant purchases of fresh tuna occur since Thailand cannot supply its export demand with fish caught in its own territorial fishing grounds.

Imports by amount during 1989 included fiber crops - US\$613.4 million, wood and related products -US\$443 million, fertilizers -US\$407.3 million, paper and paper products -US\$392.6 million, animal products-US\$247.7 million, animal feed -US\$166 million, and milk products-US\$131.6 million.

Excellent opportunities exist for increasing production efficiency via improved technology. Considerable export growth should occur in several classifications such as fruit, pineapple, banana, vegetables, shrimp and cultivated fish, dairy, swine, poultry, and perhaps beef production. Total agriculture exports were expanded by 98.8 per cent from US\$4.6 billion during 1985 to US\$9.2 billion in 1989. Total imports during the same period increased by 167.2 per cent from US\$1.53 billion to US\$4.09 billion.

#### FOREIGN INVESTMENTS

Foreign investors are allowed to invest through setting up of business or equity participation and invest in the Securities Exchange of Thailand. Foreign investments in Thailand which receive promotional privileges from the Board of Investment are accorded various incentives and special benefits.

There is no restriction on capital investment or foreign borrowing. Remittance of investment funds and foreign loans into Thailand are freely permitted without limit, but foreign exchange inflows in the form of capital and loans must be surrendered to authorized banks or deposited in a foreign currency account within 15 days from the date of receipt.

Table 28

Repatriation of investment funds, dividends and profits, as well as loan repayments and interest payments thereon, net of all taxes, may be made freely. Securities, promissory notes and bills of exchange may be sent abroad without restriction. (see Table 29, Where the Money Goes).

## FINANCIAL SERVICES

Most foreign businesses that set up operations in Thailand look to overseas sources for capital financing. Local sources for financial assistance include commercial banks, finance companies, insurance firms and the stock exchange. The commercial banks are the largest lenders with approximately 80 per cent of all commercial loans. In addition, commercial banking institutions offer services which are not available through other sources such as money transfers and foreign exchange transactions.

The most common type of commercial loan is in the form of an overdraft service with interest paid on the outstanding daily balance. These usually extend for a period of one to three years. Term loans are also available, and the number provided annually is growing. Interest is generally charged at the overdraft rate with an additional processing fee of 1.5 per cent and 0.5 per cent charge on unused funds.

The banking system in Thailand is sizable with 15 incorporated banks which have almost 2,000 domestic branches. Bangkok Bank is the largest bank in the system and also the largest in Southeast Asia. The commercial banks have a 95 per cent market share of deposits and loans in the banking system.

Commercial Banks Operating in Thailand			
Banks incorporated in Thailand	97.90%	Banks incorporated Abroad	2.10%
Bangkok Bank	26.60%	Bank of Tokyo	0.46%
Krung Thai Bank	14.72%	Citibank	0.32%
Thai Farmers Bank	14.21%	Mitsui Bank	0.25%
Siam Commercial Bank	9.78%	Hongkong & Shanghai Banking Corporation	0.20%
Bank of Ayudhya	7.27%	Standard Chartered Bank	0.19%
Thai Military Bank	5.61%	Deutsche Bank (Asia)	0.19%
Siam City Bank	3.41%	Chase Manhattan Bank	0.12%
Bangkok Metropolitan Bank	3.15%	Barque Indosuez	0.10%
Bangkok Bank of Commerce	3.40%	Security Pacific Asian Bank	0.04%
First Bangkok City Bank	3.07%	Bank of America N.T. & S.A.	0.07%
Bank of Asia	2.18%	Bank of Siam	0.05%
Union Bank of Bangkok	1.58%	International Commercial Bank of China	0.03%
Thai Danu Bank	1.50%	United Malayan Banking Corporation	0.02%
Nakornthon Bank	1.04%	Four Seas Communication Bank	0.02%
Laem Thong Bank	0.38%		

Note : Percentages represent deposit shares in 1990  
Source : Bank of Thailand

In order to meet the economic development needs of the country, Thailand banks have become progressively more international in their operations. Six of the banks now operate overseas branches. In addition to local banks, 14 foreign banks are licensed to engage in business in Thailand, plus there are 31 representative offices of foreign banks.

Commercial bank assets were 1,258 billion baht at the end of the fiscal year, June, 1990. Commercial bank assets have increased at the rate of approximately 20 per cent per annum since 1981. 1985 and 1986 were exceptions. During this period the rate of growth slowed to approximately 10 per cent. Foreign bank deposits are only 2 per cent of the total.

The competition in commercial banking in recent years has forced many banks to vie for market share. Banks have responded by upgrading their operations through computerization, providing electronic banking and other services.

Table 29

**Where the Money Goes**Inflows of foreign direct investment to developing countries  
(Annual averages, in billions of dollars)

	1980-84	1985-89	1988-89
<b>REGIONS</b>			
Africa	\$1.20	\$ 2.60	\$ 3.20
Latin America and Caribbean	6.10	8.30	10.00
East, South and Southeast Asia	4.70	10.70	15.20
Oceania	0.13	0.14	0.20
West Asia	0.37	0.40	0.54
Other	0.04	0.03	0.06
<b>LARGEST RECIPIENTS</b>			
Argentina	\$0.44	\$0.73	\$1.09
Brazil	2.10	1.59	2.53
China	0.53	2.49	3.29
Colombia	0.40	0.56	0.39
Egypt	0.56	1.23	1.40
Hong Kong	0.68	1.85	2.04
Malaysia	1.13	0.83	1.28
Mexico	1.50	2.02	2.42
Singapore	1.39	2.50	3.29
Thailand	0.29	0.72	1.40

Source: UNCTC

(see Table 28, Commercial Banks Operating in Thailand). The second most significant monetary organizations are the finance and securities institutions. Their assets comprise approximately 13 per cent of the total financial system. There are 115 finance and securities organizations with assets (as of December, 19908) of 200 billion baht. In addition, there are 25 credit financiers that make available syndicated and consumer financing. These institutions usually have an interest rate about 2 per cent higher than commercial banks, and the loans are often short-term.

Because the financial system is primarily located in the Bangkok area, outlying rural areas experience inadequate disbursement of funds and activation of savings. This has resulted in an unofficial financial market which partially fills the needs of many rural farmers, small businesses, and households. Organizations of this type conduct a large number of small financial transactions.

The Government of Thailand administers four non-commercial banks which make loans available in specific areas. They are primarily concerned with agriculture, housing, savings and industry. Included in this group are the Bank of Agriculture and Agriculture Cooperatives, the Government Housing Bank, the Government Savings Bank and the Industrial Finance Corporation of Thailand.

The only bank which deals specifically with industrial development is the Industrial Finance Corporation of Thailand. It is a government system which provides medium and long-term loans and other services including, but not limited to, guarantees, advisory services and underwriting services. This organization can offer concessionary rates for new export companies and expansion and upgrading of companies presently in operation. Its operations are comparatively small, and fixed rate financing is limited to a maximum period of a few years.

The Securities Exchange of Thailand (SET) has increasingly become a center for exchange of equity and debt. Business practices in Thailand have traditionally supported the principle of financing by short-term debt rather than equity. This is reflected by the high debt/equity ratios among Thai businesses. While still considered new and underdeveloped when compared to the markets in Singapore and Hong Kong, SET has experienced formidable growth during the past few years.

## APPENDIX C

The primary elements which control the structure and movement of interest and exchange rates in Thailand are the developing financial market, international trade and a flexible system for gradual exchange rates adjustments. Because the Thailand financial market is still in a developmental process, market forces do not operate freely, and the Bank of Thailand frequently controls interest and exchange rates. An international trade deficit and high foreign debt drove the government to foster a strict monetary policy during the first half of the decade of the 1980's. Since that time, improvements in the international economic environment have presented a more positive climate in Thailand.

In 1986, a balance in international trade accounts was realized, and interest rates began a steady decline. The Bank of Thailand has established the average value of the Thai baht against the currencies of a group of the major industrialized countries. This allows for measured exchange rate adjustments on a daily basis. The Thai baht is tied approximately 10 per cent to the Japanese Yen and from 80-85 per cent to the American dollar. The current exchange rate, effective this date, is 25.70 bahts to 1 U.S. Dollar.

All capital imported to Thailand for business purposes must be registered with the Bank of Thailand to enable the business to repatriate the funds at a later date. The Investment Promotion Act of 1977 addresses the conditions under which a promoted investor or business may remit foreign currency abroad. The Bank of Thailand has a reputation of honoring commitments.

A 20 per cent withholding tax is imposed on businesses in Thailand in addition to a corporate income tax for profits remitted or retained outside the country. Firms incorporated in other countries have approximately 25 per cent withheld from gross remittance. Double taxation for U.S. citizens provides that earnings are taxable only if the taxpayer has a permanent residence in Thailand. Double taxation agreements are presently in place between Thailand and 22 other countries.

There are approximately 70 insurance companies in Thailand which offer coverage other than life insurance. These companies provide coverage necessary for business operation such as damage and liability. In addition, insurance companies may extend loans with fixed assets as collateral, procure or rediscount tax credits of the Finance Ministry and treasury bills, and invest in trusts listed as eligible for trading on the stock exchange.

The Ministry of Industry has the responsibility of establishing industrial standards. The agency which administers standard regulations through an inspection process is the Thai Industrial Standard Institute (TISI). The TISI has categorized standards as recommended or compulsory. The regulations apply to finished products or methods of manufacturing or production. In addition to the government inspection agency, 10 independent inspection companies are presently operating in Thailand.

## Appendix D - ASACI Thailand Contact List

**Lars Andersson**  
Alfa-Lavel (Thailand), Ltd.  
Klan Gwan House II, 15th Floor  
140/1 Wireless Road  
Bangkok, Thailand  
662-251-1211 OFF  
662-254-1156 FAX

**Komol Anutarasreth**  
East Land Crop Products Corporation  
187 Happyland Soi 1, Ladpraw St.  
Bangkapi District  
Bangkok, Thailand  
662-378-0830 OFF

**Michael Blackburn**  
South East Asia  
FMC (Thailand) Ltd.  
13th Floor Regent House  
183 Rajdamri Road  
Bangkok, Thailand  
662-255-7054 OFF  
662-255-7055 FAX

**Sansonthi Boonyothayan**  
Provincial Land Consolidation Officer  
Sakon Nakon, Thailand  
662-713-223 OFF

**Atchaka Brimble**  
Planning and Development Division  
Office of the Board of Investment  
556 Vipavadee Rangsit Road  
Banghen  
Bangkok, Thailand  
662-270-1400 OFF  
662-271-0777 FAX

**Dara Buangsuwon**  
Division of Plant Pathology  
Department of Agriculture  
Chatujak  
Bangkok, Thailand  
662-579-4127 OFF  
662-579-0148 FAX

**Cecil Carder**  
Security Pacific Asian Bank  
CP Tower Building, 4th Floor  
313 Silom Road  
Bangkok, Thailand  
662-231-0320 OFF  
662-231-0346 FAX

**Ray Carter**  
Purina (Thailand), Ltd.  
888/206-7, 3rd Floor, Mahatun Plaza  
Ploenchit Road  
Bangkok, Thailand  
662-254-9325 OFF  
662-253-2679 FAX

**Suwalee Chandkrachang**  
Biopolymer Research Unit  
Srinakerinvitrot University  
Department of Chemistry  
Sukumvit 23  
Bangkok, Thailand  
662-259-1151 OFF

**Vilailuck Charoenkul**  
Project Division  
Ministry of Agriculture and Cooperative  
Office of the Permanent Secretary  
Bangkok, Thailand  
662-281-8710 OFF

**Herb Cochran**  
Commercial Affairs  
American Embassy  
Klan Gwan Building  
140 Wireless Road  
Bangkok, Thailand  
662-253-4920 OFF  
662-255-2915 FAX

**Pongthep Didyasarin**  
A&ID Consultants Company, Ltd.  
C.P. Tower, 14th Floor  
313 Silom Road, Bangrak  
Bangkok, Thailand  
662-231-0297 OFF  
662-231-0212 FAX

**Martin Dudley**  
Cargill Ltd.  
6th Floor, Chokchal International Building  
690 Sukhumvit Road  
Bangkok, Thailand  
662-258-0520 OFF  
662-260-1178 FAX

**Neil C. Edin**  
Regional Contracting Officer  
USAID/Thailand  
37 Petchburi Soi 15  
Bangkok, Thailand 10400  
011-662-255-3668 OFF  
011-662-255-3730 FAX

**Esarn Dairies Company Limited**  
518/5 Maneeya Center  
15th Floor, Ploenchit Road  
Bangkok, Thailand  
662-254-8178 OFF  
662-254-8251 FAX

**Peter Deinken**  
Human Capital and Technology  
USAID/Thailand  
37 Petchburi Soi 15  
Bangkok, Thailand 10400  
011-662-255-3650 OFF

**Peter Feddersen**  
G. Premjee Ltd.  
8/30 North Sathorn Road  
G.P.O. Box 207  
Bangkok, Thailand  
662-235-0550 OFF  
662-236-6836 FAX

**Richard Frankel**  
Agri-Systems (Thailand) Co., Ltd.  
Kow Yoo Hah Motor Building, 5th Floor  
507 Rajvithee Road Sam Sen Nai  
Bangkok, Thailand  
662-246-3505 OFF  
662-246-3509 FAX

**Douglas Gardner**  
Finance and Administration  
Mekong Secretariat  
Rama I Road  
Bangkok, Thailand  
662-255-0029 OFF  
662-225-2796 FAX

**Jim Grossman**  
Private Sector Officer, USAID/Thailand  
37 Petchburi Soi 15  
Bangkok, Thailand 10400  
011-662-255-3650 OFF  
011-662-255-3730 FAX

**Robert Hawthorne**  
Dole Thailand Ltd.  
9th Floor, Vanit Office Building  
1126/1 New Petchburi Road  
Bangkok, Thailand  
662-250-0810 OFF  
662-253-4232 FAX

**Thongkorn Hiranraks**  
Agriculture Officer, USAID/Thailand  
37 Petchburi Soi 15  
Bangkok, Thailand 10400  
011-662-255-3650 OFF

## Appendix D - ASACI Thailand Contact List

**Manus Hongsaprug**  
Dairy Farming Promotion of Thailand  
160 Mittrapharb Road  
Muak Lek  
Saraburi,  
662-279-2013 OFF

**Kamchai Iamsuri**  
Kamol Kij Company, Ltd.  
293/23-62 Surawongse Rd.  
Bangkok, Thailand  
662-234-1502 OFF  
662-236-5197 FAX

**Sawai Kaewtathip**  
The Marine Development Co. Ltd  
51 Krabi Road  
Phuket, Thailand  
662-211-962 OFF

**Pamela Kent**  
Pacrim Associates Ltd.  
Pacrim Associates Regent Hotel  
155 Rajadamri Road  
Bangkok, Thailand  
662-251-6127 OFF  
662-253-9195 FAX

**Ampon Kittiampon**  
SPAD (OAE/ANU)  
Office of Agricultural Economics  
Rajadamneun Avenue  
Bangkok, Thailand  
662-281-3958 OFF  
662-281-6142 FAX

**Karl Kunz**  
Aquastar Ltd.  
8th Floor, Sathorn Thai Building II  
92/14-15 North Sathorn Road  
Bangkok, Thailand  
662-238-5145 OFF  
662-236-6025 FAX

**Sukdigiam Kupasrimonkol**  
IFC  
1818 H Street, NW  
Washington, DC

**Narong Leesuksontikul**  
The T.A.S. Group  
Charunsanitwong Road  
Bangplud  
Bangkok, Thailand  
662-434-0250 OFF  
662-433-4403 FAX

**David Lyman**  
Tilleke and Gibbons, R.O.P.  
Advocates and Solicitors  
64/1 Sol Ton Son, Ploenchit Road  
Bangkok, Thailand  
662-254-2640 OFF  
662-254-4304 FAX

**MPA International**  
518/5 Maneeya Center  
15th Floor, Ploenchit Road  
Bangkok, Thailand  
662-254-8178 OFF  
662-254-8251 FAX

**Sophia Mackay**  
International (Thailand) Corporation  
107/4 Soi Landplao 93  
Lardplao  
Bangkok, Thailand  
662-539-0627 OFF  
662-539-0627 FAX

**Cherdsak Maesup**  
Upjohn Company, Ltd.  
White Group Building, 6th Floor  
75 Soi Rubia, Sukhumvit 42  
Bangkok, Thailand  
662-391-7567 OFF  
662-381-1365 FAX

**Andrew Morris**  
National Starch and Chemical, Ltd.  
Teo Hong Bangna Building, 4th Floor  
42/2 Moo 10, KM. 4.5, Bang Na-Trat Hwy.  
Bangkok, Thailand  
662-398-0117 OFF  
662-399-1219 FAX

**Boonsong Netcharussaeng**  
Thai Global Foods Co. Ltd.  
1752/49 S. P. Garden  
Pinklao-Nakornchaisri Road  
Bangkok, Thailand  
662-435-2212 OFF  
662-434-6360 FAX

**Nongpho Dairy Cooperative Ltd.**  
119 M3 Nongpho  
Photoram District  
Ratchaburi, Thailand

**Wirote Pattarajinda**  
Khon Kaen Dairies Co. Ltd.  
Khon Kaen,  
662-254-8178 OFF  
662-254-8251 FAX

**Richard Petges**  
United States Embassy  
Wireless Road  
Bangkok, Thailand  
662-252-5040 OFF  
662-255-9199 FAX

**Utai Pisone**  
Foreign Agricultural Relations  
Office of the Permanent Secretary  
Ministry Of Agriculture & Cooperatives  
Department of Agriculture  
Bangkok, Thailand  
662-281-6996 OFF

**Smarn Pongsacharoennont**  
Warner Lambert  
Adams (Thailand) Ltd.  
415 Soi Mitr-Udom 2  
Sukhumvit Road, Samrong Nua  
Samutprakarn, Thailand  
662-393-2286 OFF  
662-398-3140 FAX

**Chulhathep Pongsroypech**  
Seed Division  
Department of Agricultural Extension  
Ministry of Agriculture & Cooperatives  
Department of Agriculture  
Bangkok, Thailand  
662-579-3009 OFF

**Virat Prombred**  
Chokchai Dairy Farm Co. Ltd  
294 Vibhavadeerangsit R.  
Lumlooka  
Pathumtani, Thailand  
662-523-6662 OFF  
662-531-2436 FAX

**Boontam Prommani**  
Agriculture Economic Research Division  
Ministry of Agriculture and Economics  
Office of Agriculture Economics  
964 Ram Intranivate  
Bangkok, Thailand  
662-510-9498 OFF  
662-281-0371 OFF

**Prasert Punyathiti**  
Hortthai Co., Ltd  
71/12 Soi Pongdamri 3  
Ngamwongwan Road  
Bangkok, Thailand  
662-589-5074 OFF

## Appendix D - ASACI Thailand Contact List

**Wanee Ratauvaraha**  
Technical Division  
Cooperative Promotion Department  
Bangkok, Thailand

**Thomas Reese**  
Mission Director  
USAID/Thailand  
37 Petchburi Soi 15  
Bangkok, Thailand 10400  
011-662-255-3650 OFF  
011-662-255-3730 FAX

**Piphat Saetang**  
Thai Castor Oil Industries Co., Ltd.  
12th Floor Orakarn Building  
26/42 Soi Chidlom Ploenchit Road  
Bangkok, Thailand  
662-254-1490 OFF  
662-225-4199 FAX

**Yongsak Sarasombath**  
Agricultural Research Sub-Division  
Ministry of Commerce  
Bangkok, Thailand  
662-282-6171 OFF

**Yookti Sarikaphuti**  
Office of the Permanent Secretary  
Department of Agriculture  
Bangkok, Thailand

**Thomas Seale**  
American Chamber of Commerce  
140 Wireless Road  
P.O. Box 11-1095  
Bangkok, Thailand  
662-251-9266 OFF  
662-255-2454 FAX

**David Seldon**  
Wilber-Ellis Company  
Connell Brothers Company, Ltd.  
GPO Box 1543  
Bangkok, Thailand  
662-541-1432 OFF  
662-541-1431 FAX

**Frank Sodetz**  
The Tomorrow Group  
20/254 Soi Pithaktham  
Bangkok Noi, Thonburi  
Bangkok, Thailand  
662-434-4386 OFF

**Nida Sombatpiboon**  
Alternative Design  
36/11-12 Soi Land Suan  
Ploenchit Road  
Bangkok, Thailand  
662-253-5858 OFF  
662-253-5858 FAX

**Suchart Srihiran**  
Sales Division  
Thai Topy International Corporation Ltd  
14th Floor Asoke Towers  
219/44 Soi Asoke, Sukhumvit 21 Road  
Bangkok, Thailand  
662-254-7837 FAX  
662-259-1185 OFF

**Bruce St. John**  
Caterpillar Far East Commercial, Ltd.  
1760 Sukhumvit Road, 6th Floor  
Bangkok, Thailand  
662-331-5610 OFF  
662-331-5700 FAX

**Suan Sudchai**  
Krung Thai Intercontinental Co., Ltd.  
3675 Rama IV Road  
Prakanoung  
Bangkok, Thailand  
662-258-0245 OFF  
662-258-8103 FAX

**Annuay Sujarittam**  
Board of Trade of Thailand  
150 Rajbopit Road  
Bangkok, Thailand  
662-221-0555 OFF  
662-221-1827 OFF

**Chaiyot Suntivong**  
Office of the Board of Investment  
Northern Industrial Center  
Toong Hotel Road  
Chiang Mai, Thailand

**Bangchong Tanungsungnoen**  
Regional Irrigation Office  
Thailand

**Ajva Taulananda**  
Deputy Minister of Agriculture  
Agriculture and Cooperatives  
Thailand Ministry of Agriculture  
Bangkok, Thailand

**Suchart Thada-Thamrongvech**  
Economics  
Ramkhamhaeng University  
C.P. Tower, 14th Floor  
313 Silom Road, Bangrak  
Bangkok, Thailand  
662-231-0290 OFF  
662-231-0212 FAX

**Thana Thongton**  
Office of the Permanent Secretary  
Ministry of Agriculture and Cooperative  
Department of Agriculture  
Bangkok, Thailand  
662-281-0648 OFF

**Socksai Toornmarree**  
Agricultural Cooperative Division  
Cooperative Promotion Department  
Bangkok, Thailand  
662-282-5854 OFF

**Malee Tridechaphol**  
Group Systems International (FE) Ltd.  
C.P. Tower (3rd Floor)  
313 Salom Road  
Bangkok, Thailand  
662-231-0113 OFF  
662-231-0112 FAX

**USAID/Thailand**  
37 Petchburi Soi 15  
Bangkok, Thailand  
011-662-255-3730 FAX

**Andrew Watson**  
World Agricultural Technology Inc.  
P.O. Box 7228  
Nogales, AZ  
602-281-4664 OFF  
602-281-2482 FAX

**Tony Zola**  
MIDAS Agronomics Company, Ltd.  
Technic Building, Room 403  
48 Soi Lartbanya, Sri Ayudthaya Road  
Bangkok, Thailand  
662-246-1714 OFF  
662-246-5785 FAX

## BIBLIOGRAPHY

Abt Associates, Inc. (1989). *Agribusiness Development in Asia and the Near East: Strategic Issues and a Plan for Action*. Washington, DC: Agency for International Development.

American Chamber of Commerce in Thailand. (1991). *Thailand in Brief*, Bangkok, Thailand.

SAC International. (1990). *Agribusiness Investment Opportunities in the Hashemite Kingdom of Jordan*, Project Survey Report. McLean, VA.

ASAC International. (1987). *Agribusiness Investment Opportunities in Philippines, Volume II: Project Profile Report*. McLean, VA.

Bank of Thailand. (1991). *Exchange Regulations in Thailand*. Bangkok, Thailand.

Bro, Carl. (1991). *Study of the Future Role of the Dairy Farming Promotion Organization of Thailand*, Vol I. Danish International Development Agency.

Bro, Carl. (1991). *Study of the Future Role of the Dairy Farming Promotion Organization of Thailand*, Vol II. Danish International Development Agency.

Dairy Farming Promotion Organization of Thailand. Muak Lek. *D.P.O. Profile*.

Chandrkrachang, Suwalee. Bangkok. *Seaweed Production And Processing*.

Coopers and Lybrand, *Thailand. A Guide for Businessmen and Investors*. 3rd Edition. Bangkok, Thailand.

Holtzman, John S. (1986). *Rapid Reconnaissance Guidelines for Agricultural Marketing and Food System Research in Developing Countries*. Working Paper No. 30, MSU International Development Papers. East Lansing, Michigan.

International Food Policy Research Institute. (1987). *Third World Food Markets: Option for Agricultural Exporters*. Washington, DC.

International Bank for Reconstruction and Development. (1983). *Appraising Poultry Enterprises for Profitability: A Manual for Potential Investors*. Washington, DC: The World Bank.

Journal of International Food & Agribusiness Marketing. (1989). *Supply and Marketing Organization for Agricultural Processing in the Developing Countries*. Binghamton, NY: The Haworth Press, Inc.

Keesing, Donald B. and Andrew Singer. (October 1989). *How to Provide High Impact Assistance to Manufactured Exports from Developing Countries*. IBRD.

Keesing, Donald B. and Singer, Andrew. (October 1989). *What Goes Wrong in Official Promotion and Marketing Assistance for Manufactured Exports from Developing Countries*. IBRD.

Manager Magazine. (July 1991). *The Trouble with Prawns*. The Manager Company, Bangkok, Thailand. Polvatanasug, Vichien.

Nongpho Dairy Co-Operative Ltd. *Report*. Nongpho, Thailand.

Sanyal, Bish. *The Politics Of The Informal Sector In Asia*. M.I.T., Cambridge, MA.

Thailand Board of Investment. (1990). *The Investment Environment in Thailand*. Bangkok, Thailand.

Thailand Board of Investment. (1990). *Thailand Investment 1990*, A directory of BOI Promoted Companies. Bangkok, Thailand.

Thailand Board of Investment. (1990). *The Climate and Incentives for Investors*. Bangkok, Thailand. Tookwinas, Siri. *Marine Prawn Farming in Thailand*. Thailand Department of Fisheries. Bangkok.

Thailand Board of Investment. (1990). *Thailand Investment 1990*, A directory of BOI Promoted Companies. Bangkok, Thailand:

Gittinger, J. Price. (1982). *Economic Analysis of Agricultural Projects* (2nd ed.). Washington, DC: The John Hopkins University Press.

United States Agency for International Development, Asia Near East Bureau. (1990). *Promoting Agribusiness in Asia, Eastern Europe, the Near East, North Africa and the South Pacific: A Strategy for A.I.D.'s ANE Missions*. Washington, DC: Agency for International Development.

United States Agency for International Development, Bureau for Science and Technology Office. (1989). *Agribusiness Development in Asia and the Near East: Strategic Issues and a Plan for Action*. Washington, DC: Agency for International Development.

United States Agency for International Development, Bureau for Asia, Near East and Europe. (1990). *Meeting the Challenge: An Asia and Near East Food Systems Strategy for Growth in the 1990's*. Washington, DC: Agency for International Development.

United States Embassy. (1991). *Foreign Economic Trends and Their Implication for the United States*. U.S. Department of Commerce. Washington DC.

United States Department of Agriculture. (1988). *World Agriculture, Situation and Outlook Report*. Reprint. Third World Agriculture and U.S. Agricultural Interests. Washington, DC.

United States Embassy. (1991). *Key Contacts for U.S. Businesses, for the United States*. U.S. Department of Commerce. Washington DC.

United States Embassy, Bangkok. *Gedes Voluntary Report: Thailand's Dairy Industry*.

United States Embassy, Bangkok. *Gedes Voluntary Report: The Thai Swine Industry*.

World Bank, Asia Region. *Thailand: Agro-Industrial Diversification: Issues and Prospects*.

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and ASACI's Project Officer, John Balis, Acting Chief of Production, Investment and Environment Division, Office of Development Resources, Bureau for Near East. A special thanks to their staffs who made significant contributions with their time, energy, and enthusiasm.

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