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**Environmental,
Food Quality,
and Food Safety
Issues Affecting
Agribusiness in
Selected Asian
Countries**

Technical Report No. 10



**Regional Agribusiness Project
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Environmental, Food Quality, and Food Safety Issues Affecting Agribusiness in Selected Asian Countries

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EXECUTIVE SUMMARY

The Asia Regional Agribusiness Project (RAP) has four major components (marketing, trade and cooperative ventures, environment, and regional economic analysis), which support agribusiness initiatives of the U.S. Agency for International Development in six Asian countries. These RAP-supported countries or “RAP countries” (as they are termed) are Bangladesh, India, Indonesia, Nepal, the Philippines, and Sri Lanka. The RAP environmental component was established to provide technical support to the USAID bilateral agribusiness projects and their clients in these countries in environmental sustainability, and to help these agroindustries meet environmental and food quality-related entry requirements by their major target markets.

RAP was also designed to develop, coordinate, and implement regional approaches to resolve technical issues involving environment and agribusiness. There are two major target areas where environmental concerns need to be integrated with agribusiness — environmentally friendly techniques appropriate for the intensive production of high-value agribusiness commodities such as fruit, horticultural crops, cocoa, seafood, and spices, and environmental issues associated with agroprocessing activities. In the former target area, programs that will minimize the use of synthetic agrochemicals will be emphasized. In the latter area, programs to minimize end-of-pipe pollution and to improve product safety and quality will be considered.

Market entry requirements for these fresh and processed products will be made more transparent, while at the same time product bound for domestic markets will be made more safe and wholesome and will be produced in an environmentally sound manner. It is important to note, therefore, that when this report refers to “environmental” issues, that food safety and food quality issues are to be included.

This report presents the major environmental, food quality, and food safety issues found to be constraining agribusiness trade in the RAP countries based on visits by a RAP environmental team to government agencies, trade associations, universities, and private industry firms. Because RAP anticipates that this report will be widely circulated, findings from the private sector firms have been kept generic to respect proprietary interests. When appropriate, RAP can provide detailed interview notes on each individual firm on a need-to-know basis. Visits were undertaken in all RAP countries and in select Asian export markets including Japan, Hong Kong, Singapore, and South Korea. Visits were also undertaken in the United States with key government agencies such as the U.S. Food and Drug Administration (FDA).

The report can be used in several ways:

- Individual USAID Asia Mission and agribusiness project staff and clients can turn to their country section and read about issues and interventions of specific concern to them.
- USAID Asia Mission and agribusiness project staff and clients can be made aware of environmental issues affecting agribusiness in other “sister” regional countries, and can assess the needs of their own programs and clients relative to others in the region.
- USAID global and regional agribusiness initiatives in Washington will find a comprehensive overview of the environmental needs of USAID’s agribusiness clients in Asia, and the proposed mechanisms for a Washington-based project (RAP) to help meet these needs.

- The report provides an analytical framework upon which to base priority regional and bilateral environmental assistance strategies for the RAP environmental component.

Following is a summary of key proposed interventions in which RAP could play a useful role. These interventions are needed to alleviate environmental and food quality constraints hampering agribusiness trade.

IMPORTING COUNTRIES

Hong Kong

No significant opportunities identified for RAP at the present time.

Japan

1. Assistance with control of oriental and melon fruit fly in exported fruit products.
2. Assistance in antibiotic drug residue minimization in the aquaculture sector.
3. Assistance in product quality improvement and pesticide minimization programs.
4. Cooperation with the Japanese International Cooperation Agency on a Sri Lankan plant quarantine project and with the Philippine Bureau of Plant Industry on a pesticides laboratory project.
5. Provision of translated food safety/phytosanitary Japanese entry requirements to exporters in the RAP countries.

Singapore

1. Hosting by FDA of a workshop on hazard and critical control point analysis (HACCP) for seafood.
2. Development of a pilot program between Singapore and several large horticultural exporters (Indonesia) to certify that pesticides are being used judiciously and that residue problems are being minimized.
3. Comparison of seafood HACCP requirements of the United States, European Union (EU), and Japan.

South Korea

No significant opportunities for RAP identified at this time.

United States

1. Increased assistance in basic quality management of fresh and especially processed seafood and produce. Emphasis should not be on overly sophisticated HACCP protocols, but on basic plant sanitation, worker hygiene, and good manufacturing practices.
2. Training in seafood HACCP for exporters of low- to medium-quality seafood.
3. Facilitation of exporter access to FDA, U.S. Environmental Protection Agency (EPA), and U.S. Department of Agriculture (USDA) databases.
4. Assistance to Indonesia to improve the "automatic detain" situation for cocoa and shrimp exports to the United States.

EXPORTING COUNTRIES (RAP COUNTRIES)**Bangladesh**

1. Assistance with food safety regulations to be implemented through the Ministry of the Environment.
2. Provision of information on sources for used food processing, waste effluent, and laboratory equipment.
3. Assistance with chemical (including pesticides) and microbiological laboratory enhancement, including analyst training. This can probably best be accomplished by a preliminary (feasibility) study to identify precise needs and resource requirements. The study should incorporate a review of the establishment of a central facility associated with agricultural export.
4. Assistance in seafood HACCP to the fisheries export industry.
5. Assistance in multiple areas including fruit and vegetable processing, waste effluent treatment, and composting.
6. Assistance with proper pesticide application, with a focus on basic applicator training and pesticide use.

India

1. Feasibility study for a Pride of India food enhancement program. For several key commodities, this program would integrate a number of key technical assistance needs including:
 - Linkage of agribusiness projects with sustainable, environmentally sound production practices;

- Export product enhancement through a recognized “seal of export quality”;
 - Pesticides minimization and integrated pest management;
 - Laboratory upgrading and analyst training;
 - Provision of technical food information in the form of quality/grade manuals, food standards information, and so forth; and
 - Improved product safety and quality.
2. Development of postharvest product quality/grade manuals, with some assistance in organic food certification.
 3. Organization of technology update workshop. This would provide updated information on food processing and could extend also to food safety and product hygiene issues.
 4. Provision of technical information services to access foreign food regulations, and where appropriate and obtainable, of food additive and pesticide safety assessment information.
 5. Providing access to relevant EPA databases to appropriate Indian agencies and organizations.
 6. Providing access to one or more viticultural and postharvest technical experts to the Indian grape industry to carry out a comprehensive technical review of the industry.
 7. Providing technical training services in food inspection (regulatory and/or voluntary quality programs), good manufacturing practices, and HACCP.
 8. Providing upgrading and analyst training for food laboratories (including pesticide residue), in the event that the Pride of India program does not move forward.

Indonesia

1. Assistance with development of an integrated pest management (IPM) program for the cocoa pod borer.
2. Assistance with resolution of the automatic detention of cocoa and shrimp exported from Indonesia to the United States.
3. Assistance to the cocoa industry in improved fermentation/flavor processes.
4. Holding one session of a regional FDA seafood HACCP workshop in Indonesia.

Nepal

1. Technical assistance to the private dairy sector in new product development and product safety.

2. Assistance to remote villages in producing higher-value, nutrient-rich fruit and vegetable crops — for both local consumption and income-generating purposes.
3. Environmental cleanup of carpet and tanning industries.

Philippines

1. Analysis of Philippines versus the developed countries in sanitary and phytosanitary (SPS) standards to show where deficiencies are with regard to entry into GATT.
2. Assistance with the development of an extraneous materials testing laboratory, specifically providing a list of needed testing equipment and providing analyst training.
3. Provision of assistance with basic good manufacturing practices and quality control programs.
4. Development of model plans and specifications for small to medium-sized food-processing establishments.
5. Assistance to select agribusinesses and nongovernmental organizations in sustainable agricultural practices, including IPM and organic farming techniques.

Sri Lanka

1. Assistance to develop and train a food/agriculture analytical laboratory that can provide services to:
 - Domestic and export-oriented food processors;
 - Government agriculture and research agencies;
 - Medical agencies involved in poison control work including pesticide poisonings; and
 - The agriculture sector in general.
2. Additional assistance to microenterprise food-processing projects and firms by the development of a basic training handbook in food processing for microenterprises and by providing one-on-one technical assistance and training seminars on food plant sanitation, good manufacturing practices, and wastestream management.
3. Assistance with the development of a national food inspection and food standards system. The initial focus would be on developing food standards for key Sri Lankan commodities and processed food products; the secondary focus would be developing a program to implement basic inspection and hygiene standards within the processing industry. Also to be considered are basic training programs in retail and food service hygiene.

Based on the results of the fact-finding missions to all the countries mentioned above and as a result of events involving follow-up between RAP and the USAID field Missions and agribusiness

projects, the following is a list of the priority RAP activities that have emerged since the field interviews were conducted. These are the activities that, as of this writing (June 1995), are now the higher priority work plan items designed to alleviate some of the environmental constraints to Asian agribusiness trade identified by the RAP environment team. Some of these projects have been completed or initiated. Others are awaiting supplementary funding from the field Missions.

- Analytical study on import detentions of RAP-country products in foreign markets.
- Paper on the relationship between agribusiness and environmental risk.
- Paper on case studies of integrated pest management and the private sector.
- Paper on the pesticide policies and programs of different Asian countries.
- Regional workshop(s) in seafood HACCP.
- Regional workshop on the U.S. seafood market.
- Regional workshop(s) in food plant sanitation.
- Regional workshop on postharvest technologies.
- Regional workshop on phytosanitary barriers to trade.
- Regional food laboratory strengthening project.
- Technical assistance in dairy processing (Nepal).
- Technical assistance in local horticultural production and marketing (Nepal).
- Technical assistance in cocoa import detentions by FDA (Indonesia).
- Technical assistance on IPM control of the cocoa pod borer (Indonesia, Philippines).
- Technical assistance in filth, extraneous materials testing (Philippines).
- Technical assistance in basic good management practices and HACCP (multicountry, possibly with videos).
- Technical assistance in pesticide maximum allowable residue limits (multicountry).
- Grape/seafood export enhancement program with “seal of quality” certification (India).

CONCLUSIONS

RAP environmental team visits to both the importing and exporting countries revealed a wide range of needs to be addressed in areas linking environment, food quality, and food safety to agribusiness. For agribusiness operations to be sustainable, they have to be cognizant of and responsive

to environmental concerns. Although many processors and exporters will strive only to achieve minimum compliance with local regulations, those who seek to excel over the long term will strive to be ahead of local and international standards. They will attempt to overcomply with environmental and food safety standards to maximize public relations and consumer confidence so that brand loyalty is established early and maintained.

This is where RAP can help the most. RAP's limited resources will not be able to help agribusinesses that aim for an absolute minimum of environmental compliance. Our interventions will be of greater assistance to those who truly have a long-term vision and are genuinely concerned about the safety of their products and the way in which their production processes affect the nonrenewable resources of the environment.

In summary, then, we list below the major areas in which RAP should and can intervene to assist the RAP countries in overcoming environmental constraints to agribusiness trade.

Product Quality

This is the number one area for technical assistance from the environmental component. Key interventions should be in postharvest handling. Assistance in crucial components of the farm-to-port chain need to be addressed for fresh produce, such as cooling, bruising, sorting, washing, packaging, labelling, temporary storage, transport, and prevention of contamination from chemicals or extraneous materials. All these efforts, most of which will reduce spoilage and decomposition, are to be aimed at improving product appearance and quality at the final market destination.

RAP can also make significant contributions in product quality through technical assistance in process control and management. Interventions in good manufacturing practices, low acid canning techniques, general food plant sanitation, worker hygiene, and HACCP (when appropriate) are warranted. These interventions will improve the negative image that product from RAP countries suffer from based on concerns over contamination with filth and extraneous material.

RAP can also make contributions in providing information on minimum quality standards and consumer quality expectations in target markets. Provision of information on grades and standards is part of this, but further extension into areas such as size, shape, color, flavor, texture, varietal type, and packaging preferences is indicated.

Product Safety

Although the environmental team saw numerous opportunities for RAP to offer assistance in food safety, the importing countries (with the possible exception of the United States) considered this to be far less of an impediment to trade than food quality. Many importers are concerned about product decomposition, spoilage, contamination with toxic microbes and chemicals, and so forth, but food safety concerns do not really seem to be a driving force behind the international movement of agribusiness products out of Asia or between Asian countries. Process controls designed to improve overall product quality (such as good manufacturing practices and HACCP) will indirectly serve to improve food safety in any case. The one possible exception to this low-key perspective on food safety would be the seafood industry, where food safety is actually a priority concern and where much technical assistance to prevent product contamination with toxic microbes and drug residues is being rendered.

Another food-safety-related concern has been that of pesticide residues. Despite the substantial concerns of importers, exporters, and international donor agencies about this issue, detentions of food product in foreign ports because of residues occur relatively infrequently. Concern runs high, however, because traders are well aware that the consuming public can easily overreact to the slightest misconception or ill-founded association between food and pesticide content. The possibilities for RAP to make contributions in this area are described in the next section.

Classical Environmental Issues

Pesticide Residues

The fate of agrochemical residues in the environment appears to be a priority area for RAP intervention, particularly where residues on consumable agribusiness products are concerned. RAP can help minimize such problems through technical assistance in the following areas: safe, judicious use; the use of least-toxic alternative compounds; biological and cultural control of pests; and provision of information on maximum allowable levels of residues in foreign markets.

Integrated Pest Management (IPM)

Currently popular is the use of integrated techniques to minimize the use of synthetic agrochemicals and thereby lower production costs and increase product safety. Complete IPM systems are complex to implement and will require substantial buy-ins into RAP to achieve any meaningful degree of impact. However, RAP can more easily provide informational support — updating interested agribusinesses with the latest technical innovations in IPM, relating success stories in horticultural IPM from other parts of Asia or the world, and so forth. RAP has identified private-sector-sponsored IPM as an area of importance that has not yet reached many interested Asian agribusinesses. Most IPM programs have been promoted by state and federal agencies in staple food crops such as grains. RAP can make an important contribution by relating success stories in private-sector-sponsored IPM — medium to large companies actually making internal investments in innovative, environmentally friendly techniques to control pests.

Organic Farming

RAP also has found that another area of classic environmental interest is that of organic farming. Many agribusinesses (or the associations that support them) were highly interested in being able to supply organically certified product, especially to export markets. Their interest was considerably high even though their market research efforts for the organic products had been very limited. RAP can provide assistance to Asian agribusinesses in how to grow produce organically, how to implement a successful and legitimate certification process, and how to conduct market research for organic products.

Agroprocessing Wastestreams

Visits in the RAP countries revealed a significant number of opportunities for RAP to provide assistance in the management of wastestreams from agroprocessing facilities. Both cleanup of liquid effluents and treatment/utilization of solid wastes are areas of interest. However, the requests for such

assistance are not uniform, even within individual countries. Therefore, most of the assistance would have to be customized on a plant-by-plant basis to be effective. One potential area for common interest may be that of composting, and perhaps a regional seminar on this topic could be worthwhile. RAP might also provide generic information on low-technology solutions to end-of-pipe effluent problems focused on certain industry sectors — for example, fruit processing, poultry, dairy, and leather tanning.

Cross-cutting RAP Interventions

Export Enhancement Programs

RAP has the ability to design and help implement major sectoral export enhancement programs using principles of “total quality management” and “seal of quality” certification programs that would be recognized in foreign markets. The Pride of India export enhancement program for grapes (described conceptually in the paper) would be an example of this. RAP should initially focus on feasibility studies, overall project design, and provision of technical expertise to identify quality constraints. Thereafter, local funding sources from both the public and private sector would have to contribute in a major way to launch the program. A partnership of key stakeholders has to be willing to share in the overall cost of the program, and, in particular, the producers have to be willing to pay for laboratory testing of product, acquisition of the quality seal or logo (if merited), and the provision of outside technical expertise to identify quality gaps.

Upgrading of Analytical Food Laboratories

We identified many opportunities for RAP involvement in this area, which has cross-cutting implications for food quality, safety, and issues of general environmental concern. Food laboratory infrastructure in all the RAP countries was relatively weak, especially in the crucial area of pesticide residue analysis. Accurate detection of filth and extraneous material is another area worthy of assistance. RAP can serve to assess the status of laboratories; initiate remedial work; integrate qualified laboratories into export enhancement programs; improve importer confidence in the capabilities of local laboratories; and identify new regional market opportunities for credible, upgraded laboratories.

Technology Awareness

Asian agribusinesses seem particularly willing to be exposed to the latest technological innovations that might improve product quality and cost-effectiveness for both domestic and foreign markets. RAP can provide a steady stream of information on relevant technologies, pursue customized requests, or even sponsor regional workshops on appropriate topics. Technological transfer between USAID-supported Asian agribusiness projects is minimal — many projects are not even aware of technology breakthroughs being sponsored by USAID in similar projects in neighboring countries. RAP can serve to stimulate that all-important cross-fertilization, as well as to introduce technology innovations from other parts of the world.

Relationship to USAID Strategies

RAP is managed by USAID's Office of Agriculture and Food Security (AFS), which is a component of the Economic Growth Center of the Global Bureau. RAP, and the major environmental interventions outlined above, will assist AFS in generating sustainable agricultural growth that will expand income and food purchasing power throughout developing countries in Asia. The overriding concern is to improve food security in these countries. RAP environmental interventions will contribute to this through promoting greater efficiency and productivity in the use of agricultural and agribusiness resources while maintaining the integrity of the environment. AFS desires improved technologies in food production, processing, and marketing so that food costs to poor consumers are eventually lowered. RAP assistance in such areas as food quality, safety, and laboratory enhancement will contribute to environmental health and economic growth. Postharvest losses will be reduced. Access to more sophisticated consumers will generate added disposable income for the producers, whose operations will prosper, become more efficient, and ultimately lower per unit cost to the consumer. Although some of the USAID agribusiness projects supported by RAP have an export focus, the quality and safety interventions needed for success in export environments will also have a very positive effect on quality and safety of agribusiness products for the domestic market. This is especially true in the area of laboratory enhancement: if these facilities can be upgraded to the point where their procedures become reliable and credible, both domestic and export-oriented food producers will increase demand for their services so that they may confidently assess and track the quality and safety of their product.

Environmental interventions such as organic farming and integrated pest management, if successful, have further potential to lower production costs by minimizing the need for expensive, synthetic agrochemicals. IPM and other interventions to keep pesticide residues on food under control and efforts to clean up agroprocessing wastestreams all make contributions in environmental health. In the six RAP-supported countries, it will be exceedingly important to keep the agricultural production base as "clean and green" as possible. The use of toxic agrochemicals must be minimized. Contamination of the nonrenewable resources (especially water and soil) within the production base, or contamination of the laborers who keep the production base active, will eventually stagnate or greatly reduce output. This would lead to limited production capacity and much higher food prices in the future for the poor.

AFS strategic objective #1 is stated as follows: **"Help to ensure that adequate quantities/qualities of food become available to target populations."** RAP's environmental program will make several important contributions here. First of all, this very paper is a documentation of constraints to productivity and profitability in the agriculture and agribusiness sectors. And solutions to overcome these constraints are offered — some of which are already being implemented. Second, the RAP environmental component offers many opportunities to enhance in-country human and institutional capacity to augment agricultural productivity, although the focus is not so much on public sector institutions as on private sector ones.

Strategic objective #2 is stated as follows: **"Assist poorer households, and all individuals within them, to have adequate access (through self production and/or purchasing power) to food."** The principal RAP contribution here would be in lowered food prices through more efficient postharvest and marketing operations that decrease postharvest loss and generate maximum return on the dollar for the produce. The ability of RAP to identify and assist with the entry and quality requirements of markets willing to pay the best price for the produce is a case in point.

And finally, strategic objective #3 states that AFS should **"Promote agricultural practice that enhances the long term conservation of natural resources."** RAP-sponsored interventions in pesticide safe-use, integrated pest management, organic farming, and effluent treatment for agroprocessing facilities

can make significant contributions toward this objective. All these activities tend to conserve natural resources by minimizing degradation and exposure to potentially toxic agrochemicals and wastes.

The RAP environmental component will strive to make USAID-supported agribusiness initiatives in Asia into significant contributors to economic growth, primarily by making the postharvest process more efficient and quality driven; facilitating access to markets by making food safety, food quality, and phytosanitary requirements more transparent; and making the entire agribusiness process more sustainable through protection of the natural resources, workers, and consumers from environmental hazards. RAP cannot force environmental and quality compliance on the Asian agribusiness community. We have to adequately promote the economic and other advantages of environmental sustainability and then work with firms and entities that truly share that vision.

INTRODUCTION

The Asia Regional Agribusiness Project (RAP) has four major components (marketing, trade and cooperative ventures, environment, and regional economic analysis). These components support the agribusiness initiatives of the U.S. Agency for International Development in six Asian countries. These "RAP countries" (as they will be termed) are Bangladesh, India, Indonesia, Nepal, the Philippines, and Sri Lanka. The RAP environmental component (RAP/EC) was established to provide technical support to the USAID bilateral agribusiness projects and their clients in these countries in environmental sustainability and to help these agroindustries meet environment and food-quality-related entry requirements of their major target markets.

RAP was also designed to develop, coordinate, and implement regional approaches to resolve technical issues involving environment and agribusiness. There are two major target areas where environmental concerns need to be integrated with agribusiness: environmentally friendly techniques appropriate for the intensive production of high-value agribusiness commodities such as fruit, horticultural crops, cocoa, seafood, and spices; and environmental issues associated with agroprocessing activities. In the former target area, programs that will minimize the use of synthetic agrochemicals will be emphasized. In the latter area, programs to minimize end-of-pipe pollution and to improve product safety and quality will be considered. Market entry requirements for these fresh and processed products will be made more transparent while, at the same time, product bound for domestic markets will be made safer and more wholesome and will be produced in an environmentally sound manner. It is important to note, therefore, that when this report refers to "environmental" issues, food safety and food quality issues are to be included under the general "environmental" rubric.

Because the potential range of environmental issues and concerns are many, it was incumbent on RAP, at the very outset, to try and determine the areas of most need or, in other words, to determine the highest work priorities to optimize efficiency. This determination and prioritization could best be done by directly interviewing the organizations and individuals in RAP countries and in target export markets with knowledge of the specific environmental issues and concerns.

This report presents the major environmental, food quality, and food safety issues found to be constraining agribusiness trade in the RAP countries based on direct visits by a RAP environmental team to government agencies, trade associations, universities, and private industry firms. Because it is anticipated that this report will be widely circulated, findings from the private sector firms have been kept generic to respect proprietary interests. When appropriate, RAP can provide detailed interview notes on each individual firm on a need-to-know basis. Visits were undertaken in all RAP countries and in select Asian export markets including Japan, Hong Kong, Singapore, and South Korea. Visits were also undertaken in the United States with key government agencies such as the U.S. Food and Drug Administration (FDA). The visits were carried out by a technical team composed of Dr. John Bowman, Development Alternatives, Inc. (DAI), Environmental Specialist for RAP; Dr. H. Michael Wehr, TAS, Inc., food safety consultant for RAP project; Dr. Donald Wissman, DPRA, Inc., environmental consultant for RAP; and Steve Hawkins, U.S. Department of Agriculture, Foreign Agriculture Service (USDA/FAS) Office of International Cooperation and Development, agribusiness specialist.¹

¹ The questions that served as the basis for team interviews are found in Annex A; the countries and organizations visited within those countries are listed in Annex B.

Visits to India and Bangladesh took place in February/March 1995; all the other countries were visited during May/June 1994. To assess the priority intervention areas for RAP, this disjointed visitation scenario is less than ideal. However, most of the findings from the non-USAID entities are still timely and important. Regrettably, some of the USAID priorities in the RAP countries may have changed considerably since June 1994.

This report summarizes the major findings obtained and the needs and opportunities identified by the team. The report also identifies RAP country import issues of importance to some of the U.S. governmental agencies involved with food safety and quality. The report delineates and prioritizes areas for USAID involvement and intervention (especially that of RAP) with respect to environmental, food safety, and food quality issues.²

The report can be used in several ways:

- Individual USAID Asia Mission and agribusiness project staff and clients can turn to their country section and read about issues and interventions of specific concern to them;
- USAID Asia Mission and agribusiness project staff and clients can be made aware of environmental issues affecting agribusiness in other "sister" regional countries, and assess the relative needs of their own programs and clients relative to others in the region;
- USAID Global and Regional agribusiness initiatives in Washington can find a comprehensive overview of the environmental needs of USAID's agribusiness clients in Asia, and the proposed mechanisms for a Washington-based project (RAP) to help meet these needs; and
- For the RAP environmental component, it provides an analytical framework upon which to base its priority regional and bilateral environmental assistance strategies.

² Part of the reason behind this study was to acquire more than just a general feel for the reasons why RAP country agribusiness products were experiencing import failure into developed country markets. We also wanted to gather statistical data on import failure and make cross-country comparisons. We were successful in acquiring specific import failure data from a number of countries, but because of considerations of report length, these data will be presented in a separate RAP report entitled "Analysis of Detentions of Food Products Imported from Selected Asian Countries into the United States and Japan."

ISSUES AND OPPORTUNITIES IDENTIFIED IN COUNTRIES IMPORTING RAP COMMODITIES

In this section we present the principal findings, opportunities identified for assistance, and the specific priorities for RAP involvement with four Asian importing countries that are major markets for RAP-country food products: Japan, Hong Kong, Singapore, and South Korea. Findings and priority areas for RAP involvement are discussed by country.

JAPAN

Principal Findings

- Of the top 50 countries in food imports (by weight) to Japan, the Philippines ranks number 5, Indonesia number 12, and India number 26 (Ministry of Health and Welfare import statistics). Primary commodities imported from each of these three countries in order of weight are as follows:

Philippines: fresh bananas, fresh pineapple, shrimp, canned pineapple, and fresh mango. Philippine bananas are the single largest fresh fruit import into Japan representing greater than 50 percent of Japan fresh fruit imports (source: Japan Fresh Produce Import Facilitation Association).

Indonesia: coffee beans, shrimp, tuna, rattan utensils.

India: whole shrimp, processed shrimp, sesame, cashew nuts, peanuts.

- Ministry of Health and Welfare import statistics indicate that the primary violations of Japanese food law of products imported from RAP countries are associated with the following: seafood, product decomposition and the presence of toxic seafood species; nut products, excessive aflatoxin residues; and processed foods, presence of illegal food additives.
- Ministry of Health and Welfare import officials noted that the relative levels of violations from RAP countries are low compared with imports received from developed countries. This is primarily because of the nature of the products imported; RAP countries are exporters (to Japan) of fresh fruit and vegetable products and seafood, not processed foods. Japan's primary difficulty with imported products lies in food additives and microbiological levels, problems primarily associated with processed foods. Ministry of Health and Welfare officials specified that the primary import problems with RAP country products were the following:

Seafood: spoilage/decomposition and the presence of toxic species.

Fresh fruits and vegetables: illegal pesticide residues.

Nut products: aflatoxin contamination.

- Priority areas of concern with respect to fresh fruits and vegetables imported from RAP countries, according to the Japan Fresh Produce Import Facilitation Association, are product quality, insect/pest infestation, and excessive pesticide residues. The major issue is consistent product quality. Product quality problems include product spoilage and decomposition; lack of consistent size, shape, and color; product bruising; and improper packaging. The Association noted that products are usually grown correctly but not handled properly postharvest. The major pest problem noted from RAP countries is control of the melon fruit fly. The association indicated that a concerted effort is needed in this area.
- The Japan Fresh Produce Association was skeptical that RAP country analytical capabilities, especially for pesticides residues, were adequate.
- The Japan Fresh Produce Association believed, unofficially, that the priorities of the new Sri Lanka Plant Pest and Disease Quarantine Station built through the Japanese International Cooperation Agency (JICA) funds were to permit importation of potato and tree fruit stock.
- Japan Marine Products Importers Association noted a primary area of concern with RAP country products was food safety, particularly microbial pathogens and residues of antibiotics. The primary microbiological problem of concern was the occurrence of *Vibrio cholera* in shrimp and squid. The majority of imports are safe but problems do arise, particularly with imports from Indonesia, the Philippines, and India. A clear problem was delineated with respect to drug residues in cultured seafood. The Association indicated more effort is needed by growers to control antibiotic use and insure that proper withdrawal periods are followed prior to harvest.
- The Japan Marine Products Importers Association indicated that although seafood product quality from RAP countries has improved, there are still difficulties in this area, with better effort needed in quality control.
- JICA noted that its approach to country assistance focused primarily on infrastructure and systems development within a country at a government level with no direct private sector involvement. They perceived USAID philosophy to be, at least in part, fundamentally different, with a major component of USAID's program focused at the private sector, especially microenterprise development.
- JICA indicated a willingness to cooperate with the RAP project. Greatest potential for interaction was perceived to occur in association with RAP Sri Lanka projects, the JICA Quarantine Station Project, and a JICA project in the Philippines that will upgrade the pesticide residue laboratory of the Bureau of Plant Industry. A list of all current JICA projects was provided.

Opportunities Identified

- Assistance in RAP country product quality improvement is important. Japanese expect high food product quality, especially in fresh fruits and vegetables and seafood. Postharvest improvement to reduce spoilage and decomposition, to improve product handling, and to improve packaging are priorities.
- Assistance with RAP country pesticide minimization programs is important. Japanese consumers are very sensitive to pesticide residues on fresh commodities. Technical assistance to improve pesticide residue analytical capability is also an opportunity.

- Assistance with control of oriental and melon fruit fly in exported fruit products.
- Assistance in antibiotic drug residue minimization in the aquaculture sector.
- Cooperation with JICA on the Sri Lanka Quarantine project and the Philippine Bureau of Plant Industries laboratory project.

Priority Areas for RAP Involvement

RAP collaboration with the Japanese import community could most probably take place on two fronts: upon request, to translate, interpret, and clarify Japanese food safety, food quality, and phytosanitary import requirements for exporters in the RAP countries; and to initiate training/awareness activity between the JICA-funded plant quarantine station in Sri Lanka and RAP exporters.

HONG KONG

Principal Findings

- Total imports from RAP countries are low. Primary commodities are tropical fruits and seafood. The only commodity of major significance is bananas. The summary of Department of Health (DOH) import sampling statistics for RAP countries was obtained, as was the 1990 Hong Kong Import Statistics guide.
- Product quality across all products is the issue and a basic one. Food safety does not become an issue since quality is such an overriding concern. More specifically, individual points noted by individual importers included the following:

For seafood, the issues are small catches with no refrigeration; poor transport capabilities (including lack of refrigerated transport; marginal plants from sanitation and general operational capability; and an uneducated and often uncaring work force or one lacking industriousness. Special note was made of industry-wide deficiencies in the Philippines by one importer.

Technology is poor; little or no temperature control from field to shipping; little or no cold chain capability. Result is deteriorated product.

Specifications cannot be met with consistency. Quality is poor.

Would prefer to deal with ISO 9000 firms so that quality is assured.

- The lack of quality casts a cloud and doubt over the entire import market of a country. There is an underlying suspicion among importers with regard to RAP countries because of the pervasive problem of inferior quality.
- Product safety of RAP country products was never mentioned as an issue, probably because:

The quality issues dominate.

RAP country imports, as a percentage of total imports, are low.

The Hong Kong DOH import inspection program appears to be limited and focuses only on major import problems (for example, organophosphate pesticide residues on leafy green vegetables from China).

- Comments relating to specific economic and market factors affecting RAP countries were noted:

Several importers noted the following factors as being key in preventing their involvement in doing business with RAP countries:

- *Lack of infrastructure (transportation, sorting and grading, cold storage, port facilities, and so forth); lack of technology; and lack of attention to good product handling/sanitation practices to assure consistent product quality.*
- *Lack of investment security.*
- *Lack of physical security of facilities.*
- *Political instability and/or lack of strong governmental control of the country.*
- *Ethnic/cultural issues giving rise to a lack of worker industriousness and labor difficulties.*
- *Government corruption.*

The majority of leafy green vegetables for the Hong Kong market are imported from China. Because of geography, transportation cost, and historic trading ties, it will be difficult, if not impossible, to replace the position of China.

There is the possibility of supplying off-season (summer vegetables) from RAP countries if quality can be improved.

An opportunity exists for the supplying of summer cabbages from the Philippines (and Malaysia). Quality is currently a limiting factor in developing this market.

Niche markets may also exist for premium fruit and vegetables.

Emphasis should be placed on new product development from existing strengths (for example, tropical fruits and seafood) and the R&D infrastructure should be strengthened to make this happen.

- Several importers indicated a strong interest in working with and investing in Vietnam. The reasons given for this were several and focused on:

A quicker business cycle than for RAP countries.

Cheaper costs than RAP countries.

Presence of a good work ethic, particularly in the north.

Government has control of the country.

- The DOH indicated a strong interest in the proposed FDA Seafood HACCP workshop. All others with whom visits were conducted were importers, not seafood exporters.

Opportunities Identified

- Quality improvement activities with respect to fresh commodities is a critical priority. The need is across all fresh product areas. RAP focus should be on postharvest handling and packaging. Assuring product safety should be a key element of these programs since, once quality improves, safety will become a dominant issue.
- Using RAP countries, especially the Philippines, as a source of summer vegetables, particularly cabbages, for the Hong Kong market. Product quality improvement is a prerequisite for this opportunity.
- Development of a niche market for premium fruit and vegetable products. Product quality improvement is a prerequisite for this opportunity.
- FDA Seafood HACCP training was strongly supported.

Priority Areas for RAP Involvement

The possibility of direct collaboration between RAP and Hong Kong appears limited. The major issue is how to improve the overall quality image of produce coming from the RAP countries. This can only be done gradually and individually with each RAP country. And besides, only with time will the very strong connection between Hong Kong importers and Chinese suppliers begin to erode. Since Hong Kong is very lax in its food safety-related import requirements, this is not an area worthy of RAP focus.

SINGAPORE

Principal Findings

- Overall food control is the responsibility of the Food Control Division of the Ministry of the Environment. Food Standards are promulgated by this Division. Import authority for seafood, fresh fruits and vegetables, and meats has been delegated to the Primary Production Department (PPD) of the Ministry of National Development. For seafood, the Fisheries Division of this agency is the lead; for fresh fruits and vegetables, the Agriculture Division is the lead.
- More than 90 percent of all food consumed in Singapore is imported.
- Few processed foods from RAP countries are imported into Singapore.
- The primary sourcing for leafy green vegetables is Malaysia with Indonesia serving as a secondary source.

- Indonesia serves as a key source of cabbages and tomatoes although Thailand is the primary tomato supplier to Singapore. One importer indicated, however, that the Indonesian variety was preferred by Singapore consumers over the Thailand variety but poor quality prevents market strength. One importer emphasized that Indonesia should focus its export emphasis to Singapore on cabbages, tomatoes, and potatoes, with attention devoted to quality improvement.
- The Philippines supplies only bananas and mangoes to the market. The Philippines cannot compete in cost with Malaysia, Thailand, and Indonesia in the supply of leafy vegetables to the Singapore market.
- The lack of quality is the major issue with fresh fruits and vegetables from RAP countries. Issues include two major areas:

Overall product quality, including uniformity of size, shape, and color; product spoilage and decomposition resulting from temperature abuse from harvest to arrival in Singapore; and improper product handling.

Deficient packaging, primarily weak cardboard boxes that lead to crushed, damaged, or pilfered product. It was noted that the expense of proper packaging with low-volume RAP country production creates a prohibitive cost squeeze.

- Food safety relating to pesticide residues in fresh fruits and vegetables is not a declared issue for importers but is a declared issue for government officials. The Agriculture Division of the Primary Production Department recently (1994) implemented new rules and regulations relating to imported fruits and vegetables that are aimed directly at the illegal pesticide residue issue. They have instituted licensing of all fresh fruit and vegetable importers, instituted mandatory source labeling for all commodities, and instituted a spot checking pesticide residue test program. They have also undertaken bilateral discussions with primary fruit and vegetable suppliers on the pesticide issue and have a strong interest in initiation of some type of voluntary certification system.³
- No quarantine restrictions on edible foods exist within Singapore. Plant pest and disease restrictions do exist for certain propagation species, primarily ornamentals. Plant pest and disease as well as pesticide regulations were purchased.
- Fresh seafood is a major commodity within Singapore. More than 90 percent of all fresh fish consumed in Singapore is imported. There is a \$800 million processed fish business in Singapore of which 90 percent is re-exported. Singapore has little restriction on the importation of fresh seafood but has significant restriction on the importation of processed seafood. The import of chilled cooked seafood is prohibited. The import of frozen cooked seafood is permitted but only with a health certificate and only when it meets specific microbiological standards. Mandatory lot testing of all imported processed seafood is carried out by the Fisheries Division of the PPD.

³ Agriculture Primary Production Department Plant Health Branch officials were very interested in a potential RAP project that would involve pesticide minimization activity in conjunction with residue monitoring and product certification with a major vegetable fruit/vegetable supplier (probably in Indonesia).

- The sourcing of most fresh fish from Malaysia is by truck and from Indonesia and Thailand by vessel or air. Limited quantities of seafood are obtained from India, Sri Lanka, and Bangladesh, primarily by air.
- Lack of quality is the key issue with imported seafood. Government officials noted clear problems of RAP seafood imports relating to:

Small catches.

Lack of temperature control — no or poor icing.

Contaminated water used for ice manufacture.

Lack of cold storage.

Poor handling and sanitation practices.

Extreme difficulty in controlling or improving the good manufacturing practices (GMPs) of processors.

Lack of infrastructure for transportation, handling, and processing.

Industry officials (Seafood Importers Association of Singapore or SIAS) noted that the quality of RAP country seafood processing plants extended across the spectrum of capability — from World Class (Class A) to less than marginal operations (Class D). They indicated that, in all RAP countries, Seafood HACCP was being practiced to some extent. The Industry officials recommended that RAP consider assistance to the industry, incorporating the hazard and critical control point analysis (HACCP) concept, at multiple levels; thus assist plants in moving from class B to class A and class C to class B using a 3-5 year plan for each step. The driving force would be the ability to enter increasingly upscale markets. The industry clearly knew which firms were which and where the markets were. They indicated RAP country governments or fisheries associations could provide such information to RAP (this is, in fact, the case, as the Indonesia section below indicates).

- SIAS suggested the establishment of a privately run HACCP training center.
- SIAS identified the need to harmonize the HACCP requirements of the major export markets — the United States, the European Union (EU), and Japan. They noted that for exporters to all three markets, it is difficult to deal with the differing requirements of all three countries simultaneously. It was agreed that the first step in this process would be to carry out a comparison of seafood HACCP requirements for all three major export markets to see where the similarities and differences are.
- SIAS and the Agriculture Department Fisheries Division both indicated strong support for the FDA Seafood HACCP proposal. SIAS indicated strong support from their membership and offered to host the meeting in Singapore.

Opportunities Identified

- Quality improvement activities with respect to RAP country fresh commodities is again a priority. The issues are the same as those identified in other country visits. Postharvest quality improvement programs with a clear focus on key commodities with export potential are needed. Food safety, especially in pesticide residue minimization, is a key identified need, particularly with the implementation of Singapore's strengthened fresh product import control program.
- An opportunity exists for the design and implementation of a model pesticide certification program for fresh fruits and vegetables imported from RAP countries. Leaf green vegetables imported to Singapore from Indonesia appear to be a target commodity/country. Cooperation from the Agriculture Division's Primary Production Department can likely be obtained for this activity. The program could be a good model for other RAP countries and a beneficial program for all parties.
- Potential market enhancement for Indonesian tomatoes was identified. Identified also were market enhancements for Indonesian potatoes and cabbages. Product and packaging quality improvements are prerequisites for this development.
- Comparison of seafood HACCP regulations comparison between the United States, the European Union, and Japan was identified as a project area that would be beneficial for regional seafood processors and exporters.
- FDA Seafood HACCP training was strongly supported.

Priority Areas for RAP Involvement

Two areas have promise. First, RAP could serve as a catalyst between the Singapore Agriculture Division and one or more key produce exporters (probably from Indonesia) to develop a model pilot program focused on the goal of zero pesticide residues. Pesticide safe-use and integrated pest management (IPM) would be the focus of the program.

Second, the holding of a regional seafood HACCP workshop in Singapore under the auspices of SIAS has a high potential for success. The key question would be whether the USAID Missions will have the appropriate funds to send clients to Singapore for the training — they will prefer that RAP organize a HACCP event such that the trainers come to the RAP countries on an individual basis.

SOUTH KOREA

Principal Findings

- Almost all RAP country imports are fresh fruit, fresh seafood, or frozen seafood. Limited amounts of fresh vegetables and processed food are also imported. Bananas are the primary import commodity. Also important are spices and condiments for further processing.
- The major import problem/issue from RAP countries is product quality. Overripe fruit and spoiled or decomposed seafood are the major problems. Based on the multiple visits carried out,

these problems are associated with improper postharvest handling practices (for example, improper product handling, temperature abuse during shipment, lengthy shipping times, and weak packaging).

- Compliance problems, when they occur, are almost always associated with two areas: pesticide residue violations, and decomposition and spoilage of fishery products and spoiled or decomposed fresh fruit and vegetables. Total food safety violations with processed foods are infrequent.
- The amount of seafood imports from RAP countries is low when compared with the major import sources for this commodity — Russia, China, and Vietnam. The primary issue is quality.
- Beef imports from RAP countries do not occur because of foot and mouth disease problems. Poultry imports are essentially nil because of avian influenza and other diseases. Two-year pest status must be documented by RAP countries before allowing poultry imports.
- Plant and pest disease restriction are several and are summarized in the Korean Ministry of Agriculture, Forests, and Fisheries (MAFF) PPQ documents. A similar approach to that of APHIS is taken by MAFF to permit the entry of new plant types into Korea.
- Most prohibited plants are propagation species.
- Cut flower entry into Korea is not a problem.
- The single importer visited in Korea specified his priority issues as:

Lack of consistent quality from shipment to shipment. Variability is great with no clear way to guarantee quality.

Lack of attention to Korean Food Standards (not solely a RAP country issue).

Improper labeling according to Korean Food Standards (not solely a RAP country issue).

Inadequate packaging of canned product — specifically detinning and usage of weak (nonbeaded) tin cans.

Opportunities Identified

Quality improvement activities with respect to RAP country fresh commodities is again the priority. The issues are the same as those identified in other country visits. Postharvest quality improvement programs with a clear focus on key commodities with export potential are needed. Food safety issues, especially in pesticide residue minimization and prevention of product decomposition, are also of key concern.

Priority Areas for RAP Involvement

Opportunities for direct, meaningful cooperation with South Korea are quite limited. RAP countries do not successfully export a lot of product here. Again, RAP contributions to improving overall

product quality will serve to indirectly improve the chances for increased export successes in the Korean market.

ISSUES AND OPPORTUNITIES IDENTIFIED IN RAP PROJECT COUNTRIES

In the following section, we indicate the principal findings, opportunities identified, and the priority areas for RAP involvement in the six RAP project countries of Bangladesh, India, Indonesia, Nepal, the Philippines, and Sri Lanka.

INDONESIA

Principal Findings

- The Ministry for Agriculture, Agency for Agribusiness has submitted five priority projects to the national policy agency (BAPPENAS) for approval. They are:
 1. A study to develop/enhance agribusiness in rural areas.
 2. A feasibility study to design agribusiness projects to enhance the rural poor (microenterprise project).
 3. Development of agricultural accreditation systems including ISO 9000 and laboratory accreditation.
 4. Development of agricultural food safety and quality standards from raw products through processing.
 5. Development of a market information system.

BAPPENAS indicates that projects 2 and 4 have priority with a focus on project area 4.

- The cocoa industry (ASKINDO) has as a priority the resolution of the automatic detention of cocoa beans imported into the United States because of live insect and mold problems. This issue was also mentioned as a priority by the National Agency for Export Development (NAFED) and Sucofindo. ASKINDO noted that efforts are under way to develop new drying procedures that should assist in reducing the level of mold, and requested assistance in resolving the automatic detention problem. The RAP team noted that RAP could clarify the requirements of FDA to resolve the automatic detention, but felt that presentation of information on industry initiatives on implementing new drying procedures and submittal of hard data showing consistent resolution of the mold problem would be the best approach to removing the automatic detention situation.
- ASKINDO noted the need for biological control procedures for control of the cocoa pod borer. Of particular interest is investigation of the use of mating disrupters, or pheromone(s), of this pest. The pod borer is endemic in most cocoa growing regions, with certain growing areas closed because of the pest. Current control procedures include mechanical stripping of affected pods and burning of infested materials. A second disease of concern where control work is needed is *Heliopeltis dieback*; this insect pest attacks new shoots and pods resulting in their destruction. This pest does not have the same level of priority as the pod borer. The American Cocoa Research Institute (ACRI) has indicated an interest in IPM; RAP has initiated contact with ACRI in this regard and will pursue the activity.

- ASKINDO also spoke of a priority project related to cocoa flavor quality. The project relates to developing better control of cocoa fermentation. This is a complex area with technology interwoven with market flavor demand characteristics and market economics. ASKINDO would prefer that all beans be fermented to avoid market economic problems. Because the United States tends to buy unfermented beans there is a propensity for growers to think that they can sell unfermented beans at a higher rate of return than they can get for the fermented product (in other words, avoid the cost of fermentation). However, the bulk of the world market demands fermented beans and ASKINDO fears the loss of these markets if their growers will not ferment. Hence the thrust of ASKINDO. The U.S. cocoa industry is also interested in working on specific fermentation projects. Therefore, there may be a match between ASKINDO and the U.S. cocoa industry. Preliminary contact has been made with the American Cocoa Research Institute (ACRI) in this regard. RAP should pursue this project area.
- ASKINDO has an additional interest in strengthening the acceptance of quality certificates by foreign countries. The issue is the accuracy of representation of official certification. A potential RAP project exists in this area.
- The development and improvement of the fisheries industry is a strong priority for the Indonesian government and the industry itself. NAFED has a priority in this area as does the Directorate General of Fisheries (DGF). DGF has initiated significant activity in training government inspectors in seafood HACCP; initial training-of-trainers for DGF inspectors has already been carried out. DGF needs practical experience for their HACCP-trained inspectors before proceeding further. The thrust and immediate priority of DGF is to ensure that its inspection program and standards are equivalent to those of FDA. The second priority of DGF is to obtain HACCP capability within the industry. NAFED's priorities include the interest that DGF has in fisheries but extends also to the improvement of the food safety and quality control capabilities of the industry to produce a better product. Based on discussions with NAFED, the agency has a strong interest in the concept of moving Class B plants to Class A plants and Class C to Class B (Class A = highest level of sophistication).
- Both NAFED and DGF indicated strong interest in the FDA Seafood HACCP project.
- The Department of Health Food Control Section has a stated priority in enhancing the capability of the Indonesian food industry in good manufacturing practices, including sanitation, process control, and overall product quality and quality assurance systems. Processing plant worker training in food hygiene was a priority. Specialized training in areas such as pesticide residue analysis, food microbiology, aflatoxin analysis, and the training of field food inspectors was also indicated to be a priority. Support was stated for the concept of developing worker training videos for small to medium-sized firms that focus on basic food processing operations (raw product handling, process control, and post-processing product handling) and that feature the HACCP systems approach.
- NAFED indicated that the priority fruit and vegetable commodities slated for export were as follows:

Fruits: durian, pineapple, banana, mangosteen.

Vegetables: potato, tomato, cucumber, snow peas, baby corn, cabbage.

The primary markets indicated for these exports were Singapore, Hong Kong, Japan, South Korea, Taiwan, the United States (limited commodities), and the European Union (limited

commodities). Primary needs identified by NAFED in this area included training in the phytosanitary requirements of the above markets and training in developing quality standards for the above commodities.

- The Horticultural Export Association of Indonesia stated the following priorities for their association: enhancement of ocean transportation systems, improved efficiency of processing firms, extension of marketing channels, and information on foreign food standards including those for product irradiation.
- The Agriculture Development Project (ADP) indicated the need for a local consultancy to provide assistance to Indonesian firms in the new FDA product labeling requirements (NLEA). ADP also indicated support for a conference to strengthen Indonesian trade connections with Singapore and Hong Kong; it was suggested that the conference involve roundtable discussions with importers, exporters, and Government of Indonesia officials.

Opportunities Identified

- Catalyze a cocoa quality improvement program to improve export status. The program would include one or more of the following: improved pest control, pesticide residue reduction, improved status of official quality certificates, and assistance with fermentation process and mold control.
- Need for assistance in development of national food safety system including laboratory development, inspector training, guidance in food standards development, and implementation of improved food processing control systems.
- Clear interest in seafood HACCP including the co-sponsoring of an "all Indonesia" conference.
- Clear interest in attending a regional conference on phytosanitary issues. There is also interest in conducting a local workshop aimed at making the Government of Indonesia Plant Protection and Quarantine system more efficient.
- Establishment of a local consultancy to provide assistance to local businesses in understanding and complying with new FDA\USDA\EPA regulations, especially the new food labeling (NLEA) requirements.
- Assistance is desired in postharvest handling of fresh fruit and vegetable products.
- Interest was indicated in a conference to strengthen Indonesian trade connections with Singapore and Hong Kong.
- Interest was expressed by the Department of Health in developing food safety (HACCP) videos to train local food processing plant personnel in basic food product handling, plant sanitation, process control, and postprocess product handling procedures.

Priority Areas for RAP Involvement

At first glance, many opportunities exist for RAP collaborative activity in Indonesia. These will be limited, however, as the 1995/1996 work plan for ADP is finalized. The most promising area for RAP involvement appears to be in cocoa export quality. To produce a safer product for the eye of the American consumer, a multiagency integrated pest management project will be organized by RAP for control of the cocoa pod borer. In addition, a RAP-organized project to lift some cocoa exporting companies off the FDA detention list is anticipated. This may also be extended to shrimp firms. Both these activities will serve to strengthen the ASKINDO through RAP-facilitated linkages to the American Cocoa Research Institute (ACRI) and to FDA. Additionally, it is likely that a RAP-facilitated workshop or training event in seafood HACCP will be of considerable interest to ADP.

NEPAL

Principal Findings⁴

- The RAP environmental component will find a limited number of opportunities here since environment and food safety constraints are of low priority. Marketing, price information, and trade and cooperative venture support appear to be the biggest needs. At the time of the visit, the principal programs and priorities of the Agro Enterprise Center (AEC) were not sufficiently defined yet; therefore support in environment is a bit premature.
- At the time of the visit, real export successes of the AEC were practically nonexistent. It was even hard to discern any kind of commodity focus. AEC support of enterprises involved with nontraditional agricultural export (NTAE) products (vegetable seeds, mushrooms, baby corn, angora wool from rabbits, tissue culture products, orchids, silk, and herbal tea) was proceeding, but there was no clear indication as to which commodities were of the highest priority. AEC staff thought RAP might be most useful in providing price and market analysis information focusing on Asian and EU (as opposed to U.S.) markets.
- After meeting with several AEC-supported firms, it was apparent that they still had many needs. These firms, both large and small, were hungry for the establishment of concrete trading and supply relationships with foreign firms. Sizable investments had been made in export-oriented agribusinesses, yet demand in both internal and external markets was very ill defined. Simply put, these firms are floundering in their attempts to secure outside buyers. They speak about "potential deals," "interested buyers," "broken deals that will hopefully will be repaired," vague references to "foreign investors," and so forth. When pressed for details, it turned out that many of these firms have no concrete set-ups with foreign buyers. They seem to have little interest in domestic opportunities (where much of the demand may lie). They wanted RAP to provide any assistance whatsoever that would lead to their striking deals with foreign buyers.
- The Mission Agriculture Office (ARD) is interested in a significant buy-in to RAP for a variety of services in support of nontraditional agriculture. The buy-in probably can't be designed until

⁴ It should be noted that the visit to Nepal was significantly shorter than that of the other countries, and only one team member was able to carry out the interviews. For that reason, the Nepal section is abbreviated compared with the other countries.

mid-1995 because the Mission is awaiting the outcome of a new Asian Development Bank-funded "National Agricultural Perspective Plan" headed up by John Mellor, which will define the role for NTAEs and cash crops from the hill country in the national context. Another factor is that the new MARD project (Market Access and Rural Development) needs to be better defined. The proposed buy-in to RAP might service both the ATSP and the new MARD project. To best utilize the buy-in, the Mission has to better define the separate goals and relationships between those two projects.

- The Mission has a unique funding mechanism called SIRE (Sustainable Income for Rural Enterprise). All the ARD projects contribute funds to it. This mechanism is a pool of obligated but uncommitted money. It can only be utilized for new and novel activities that don't fall under any existing project descriptions. It is worth inquiring about as a funding source for future RAP activities.

Opportunities Identified

- AEC has considerable needs in marketing information, specifically price and volume information in the importing countries. Ideally, they would like to have on-line services. In products such as silk yarn, baby corn, and mushrooms, they would like to be linked with buyers in S.E. Asian markets and need accurate information on which countries are buying how much. Potential trade with other RAP countries is of high interest to them.
- AEC mentioned technical assistance in packaging technologies as a priority need.
- In association with a dairy development project, the Mission may be interested in food safety and good manufacturing practices for the industry, as well as technical assistance on the environmental impact of pollution from milk processing facilities. They are interested in the potential export of product such as *yak* cheese. DANIDA has been providing some assistance in these areas.
- The Office of Economics/Private Sector is particularly interested in environmental issues associated with the leather tanning and carpet dying industries.
- The disposal of old, outdated pesticides (many from India) stockpiled in decrepit, parastatal warehouses is a major concern in Nepal. ADB is already providing assistance in this area.
- Environmentalists fear that marketplace vegetables such as cauliflower, cabbage, potato, radish, carrot, and onion may be highly contaminated with BHC (an isomer of lindane). A pesticide residue testing facility called NESS (Nepal Environmental Scientific Services) has been set up by private Japanese investors. Collaboration with NESS might lead to an important market basket survey for BHC and other chemical residues.
- The ANSAB organization is trying to demonstrate the potential of small cottage industries in naturally occurring, botanical pesticides (for example, neem, eucalyptus, artemesia, and timbor dust) and other environmentally friendly technologies such as blue green algae fertilizer, kapok fibers, true potato seed, and village-level mushroom production. They have approached AEC for support but the two groups do not see eye-to-eye on the commercialization process. ANSAB wants to promote village coops and associations; AEC wants to pursue microenterprise.

- According to government researchers, IPM for high-value fruit and horticultural crops is still in its infancy in Nepal. A fair amount of IPM has been developed and promoted in cereal crops. AVRDC has supported preliminary work in biocontrol of cabbage pests such as the diamond back moth. The government is seeking IPM and biocontrol technical assistance in the following priority areas:

Shoot and fruit borer of solanaceous crops — especially eggplant;

Fruit fly in cucurbits;

Thrips in pepper; and

Fruitworm of tomato.

The downside to all this is that much basic research needs to be done in vegetable IPM in Nepal, and the government does not yet have vegetables as a high-priority intervention.

Priority Areas for RAP Involvement

Because Nepal lags far behind the other RAP countries in its readiness for export activities, opportunities similar to those in other countries will be limited. However, there appears to be a high degree of Mission interest for RAP assistance in three areas: technical assistance to the private dairy sector in new product development and product safety; assistance to remote villages in producing higher-value, nutrient-rich fruit and vegetable crops — for both local consumption and for income-generating purposes; and environmental cleanup of carpet and tanning industries.

THE PHILIPPINES

Principal Findings

- Considerable concern exists concerning the competitive position of the Philippines for entry into the General Agreement on Tariffs and Trade or GATT (and the related ASEAN Free Trade Agreement). Concern exists concerning the quality of products produced in the marketplace; there is also concern about product competitiveness both domestically and with regional competitors, especially Thailand, Malaysia, and Indonesia. A need exists for the development of international food product standards that can assist in driving the industry to improve. More extensive assistance may be necessary to rejuvenate facilities and safety and quality systems of the Philippine food industry to improve its competitiveness. This concern was voiced both by USAID Agribusiness System Assistance Project (ASAP) representatives and representatives of the food trade associations. The USAID Mission representative also noted that GATT is likely to be the driving force for policy change within the Philippines.
- A major cause of rejection of Philippine food products is the presence of filth and extraneous material. PHILFOODEX (a trade association) expressed an interest in the development of a laboratory and trained analysts to provide meaningful analytical capability for the Philippine food industry in this area. Capital investment to accomplish this need within an existing laboratory is small (probably less than \$5,000). Needed is training in analytical techniques. Assistance is

also needed on clarifying what the U.S. Defect Action Level Guidelines are for major Philippine-produced food commodities.

- Major issues within the Philippine food industry noted by the various trade association visits were the following:

High cost of processing because of inefficient equipment.

High transportation costs because of lack of road infrastructure.

High power costs.

High cost of raw ingredients.

High cost of quality packaging.

The food trade associations noted the need for assistance in the following areas.

Assistance with compliance with U.S. NLEA labeling.

Assistance with providing basic training in GMPs and quality assurance.

Upgrading of processing facilities — substantive infrastructure development.

- Specific assistance from the PHILFOODEX representative was requested on resolving an issue involving the use of annatto food coloring exported to the European Union. This can likely be handled through the RAP Clearinghouse as a food standard issue.
- Noted was a JICA project to enhance the laboratory capabilities of the Bureau of Plant Industries. JICA assistance will involve supplying laboratory instrumentation and other laboratory equipment and training analysts in pesticide residue analysis. (See discussion under Japan above.)
- The Bureau of Plant Industries indicated the need for assistance in aflatoxin analysis.
- PHILEXPORT (another trade association) was very supportive of the FDA Seafood HACCP workshop and would like to assist in coordinating the holding of one session of the workshop in Manila.
- PHILFOODEX noted the need for providing basic information on small and medium-scale food processing plant design: overall food plant layout, construction materials, processing line design, and process equipment specifications. The model plans would focus on basic food processing capabilities.
- A growing number of agribusiness-related companies in the Philippines are highly interested in environmentally friendly, sustainable agricultural techniques. The ones we visited were not multinational but strictly Filipino firms. These firms, some large, others small but growing, have become interested in finding cost-effective production technologies that are environmentally friendly. There seems to be a genuine concern for consumer health and for the long-term viability of Filipino soil and water resources. These firms are not receiving much support from governmental programs — by contrast, they seek out technologies through trial and error or

through reports of successes in other countries or in the scientific literature. The predominant concern is pesticides — how to use them as judiciously and as infrequently as possible. IPM techniques employing cultural and biological control are being employed, but in a rather haphazard, trial and error fashion. There is a thirst for knowledge of the latest disease resistant varieties, least-toxic pesticide replacement compounds, ultra efficient application devices, drip irrigation systems to conserve water, and slow release fertilizers. Due to a host of government regulations restricting the import of such technologies, many of these well-intentioned firms never get truly sustainable agricultural programs going.

The same is true, although on a lesser scale, with nongovernmental organizations (NGOs) that are trying to promote similar environmentally friendly growing practices to the poorest of the farmers. There is a lack of information on what is successful in other countries under similar, low-technology circumstances. Lack of access to technologies is not the problem here, but the absence of information and the poor availability of extension personnel to effectively deliver the environmental message to the small farmer.

Opportunities Identified

- Analysis of Philippine food standards and systems to establish food and agricultural standards against those of Codex and selected developed countries to indicate where deficiencies exist within the Philippine system with respect to GATT. The purpose of the study would be to identify where enhancements are needed to permit the Philippines to meet their GATT requirements in the food and agricultural regulatory area.
- Providing technical assistance for basic food processing GMPs, and quality control and HACCP programs targeted for small to medium-sized firms.
- Clear interest in the sponsorship of one session of the FDA Seafood HACCP Workshop in Manila.
- Providing training of farmer leaders in pesticide application efficiency and the use of organic fertilizers.
- Collaboration with the PHILRICE/IPM Collaborative Research Support Project (CRSP) in the postharvest handling of fresh fruits and vegetables.
- Providing technical assistance in organic farming; emphasis on sustainability and maximization of profits.
- Possible RAP participation in a 1995 workshop on occupational health and industrial hygiene to be sponsored by UNIDO Regional Network on Pesticides for the Asia-Pacific region.
- Assistance with the development of an extraneous materials testing laboratory, specifically providing a list of needed testing equipment and providing analyst training.
- Participation, in conjunction with the Food and Agriculture Organization (FAO), in developing a IPM success case study history across RAP countries.

- Establishment of a local consultancy to provide assistance to local businesses in understanding and complying with new FDA\USDA\EPA regulations, especially the new food labeling (NLEA) requirements.
- Providing training assistance for aflatoxin analysis.
- Assessment of IPM opportunities for tomato/potato production in Bukidnon province.
- Assistance with the environmental cleanup of the nata de coco processing operations.
- Possible RAP participation in a regional workshop (Bangkok) on botanicals.
- Coordination of the development of model plans and specifications for small to medium-sized food processing establishments focused on key commodity areas.
- Technical assistance to small to medium-sized agribusiness firms (and select NGOs) in environmentally friendly, sustainable agricultural techniques. Focus on those firms producing high-value, cash-oriented crops for both local and export markets.

Priority Areas for RAP Involvement

As in Indonesia, many possibilities exist for collaborative activities with RAP. However, it has been somewhat difficult for ASAP and RAP to decide upon a mutually agreeable area in which to collaborate. Initially, there appeared to be a great deal of interest in having RAP provide assistance in the sanitary and phytosanitary (SPS) implications of the GATT on Filipino agribusiness, but later this interest waned. Remaining priority areas for collaboration might be:

General assistance to interested private sector clients in IPM, growing and marketing of certified organic produce, and other environmentally friendly crop production techniques.

Continued informational support on market export requirements such as maximum allowable pesticide residue levels.

Support of PHILEXPORT and PHILFOODEX members through training events in good manufacturing practices, HACCP, and so forth.

RAP promotion of ASAP-sponsored success stories pertaining to environmentally friendly programs used by Filipino agribusinesses.

SRI LANKA

Principal Findings

- Technical infrastructure for agriculture development including food processing and food safety/quality appears to be significantly limited. The ability of the Ceylon Institute for Scientific Industrial Research (CISIR) to provide assistance in food/agricultural processing and testing areas is limited; although staff is trained and dynamic, physical facility limitations are significant.

CISIR maintains a pesticide residue/pesticide residue formulations laboratory. However the laboratory is inadequately equipped and lacks adequately trained staff and quality control programs. Pesticide residue test results reported from this laboratory have a creditability problem.

A CISIR postharvest technology facility is being implemented. The current state of technology is inadequate; used equipment is being obtained and installed. Staff directors appear dynamic and well trained; assistance investment by USAID in equipment and professional training could pay major dividends in agriculture capability within Sri Lanka.

A Ministry of Agriculture laboratory in Kandy for pesticide residue and pesticide formulation testing is not functional. Existing major equipment does not work and no samples are currently being tested.

Thus a single, capable, and functioning food and agriculture analytical laboratory is needed, with assistance in equipping and training. Detailed training in pesticide residue and formulation analyses and laboratory quality control is indicated. It would seem imprudent to assist more than one laboratory to gain operating capability because of the cost factor and the size of the operational need. It is recommended, based on this visit, that the Colombo CISIR facility be upgraded. Elements of the Kandy Ministry of Agriculture laboratory should probably be incorporated into the Colombo facility.

- USAID expressed a strong interest in evaluating several Sri Lankan pesticide residue or pesticide formulation testing facilities. The two facilities noted above were viewed briefly but no in-depth assessment was made, although the Kandy facility was found to be practically nonfunctional. Technical assistance is needed to carry out the Mission-requested review.
- USAID also expressed a strong interest in an environmental assessment of its entire agriculture mission portfolio.
- There is no food inspection system in Sri Lanka. Additionally, there appear to be only a few food product standards of identity or quality. A Sri Lanka Standards Institute exists but does not appear to be functioning effectively within the food and agriculture area (although this agency was not on our visitation schedule, these comments are made from conversations with other federal agencies). The establishment of a basic food safety and quality standards systems would be of benefit in providing the necessary foundation for a properly functioning domestic and export food and agriculture system.
- The current government position concerning certain highly toxic pesticides is to consider banning them because the quality of the formulation cannot be assured due to the lack of a functioning

pesticide formulations testing facility. Consideration should be given to upgrading Sri Lanka pesticides laboratory capability to assist in resolving this dilemma.

- Comments received from the Faculty of Medicine suggest that a serious pesticide worker exposure situation exists although no confirmation can be obtained because no testing facility exists within Sri Lanka that can perform the necessary physiological analyses. Again, development of an appropriate laboratory facility would be a first step to document this situation, followed by additional efforts in pesticide occupational exposure control program.
- Visits to several small food processors involved in the microenterprise program indicated that assistance in basic food technology and sanitation control would be beneficial. Although efforts by AgEnt are being made to correct this situation (for example, a CISIR workshop program on improved product quality through food hygiene and improved processing), additional activity in this area would be helpful through one-on-one basic food technology assistance to the food processing microenterprises, or the production of a basic food processing training monograph for microenterprises.
- Sri Lanka has developed a significant gherkin industry. Although a model program in agricultural development, the program is at a stage where assistance is needed both for improved pest control and in enhanced production practices. A specific need was noted with respect to biological control for both the gherkin industry and for baby corn and chillies. Industry and project representatives also expressed a need for a study on the fate of pesticide residues during postharvest handling and shipping.
- A visit to the MARD project in Mahaweli revealed two areas of potential collaboration in the environment area between RAP and MARD. First, there was an ongoing effort to initiate pesticide minimization programs in some of the high-value crops (especially chillies and gherkins). However, all of the work was still at the field research level. The research program was well defined and past midphase with a sequential set of experiments in place. It was concluded that the only real meaningful type of collaboration would be for RAP to provide literature search services on demand for the research effort, particularly in nonchemical control of the key diseases in question.

Secondly, meetings with farmers organizations sponsored by MARD led to some interesting discussions concerning safe and judicious use of pesticides. Much of the interaction took place with women farm leaders who seemed keen to learn more about how to protect themselves and their families from the inherent dangers of pesticides. Farmers seemed to know about the need to wear protective clothing, but casually explained how uncomfortable it was and how common it was to spray with a minimum of protective gear. It was also obvious that these producers had already been exposed to different levels of pesticide training efforts by NGOs such as CARE, but that, despite those efforts, pesticides were still being handled in a casual and unsafe manner. To make a dent in this area, it was clear a massive education effort was needed — probably well beyond the scope and capabilities of RAP.

Opportunities Identified

- Technical Assistance to assess the capabilities of existing pesticide residue laboratories. Also assistance to develop and train a food/agriculture analytical laboratory that can provide services to:

Domestic food processors and the agriculture industry.

Government agriculture and research agencies.

Medical agencies involved in poison control work including pesticide poisonings.

Consideration should be given to designing this facility so that it could also serve as an export testing and consultation laboratory, testing food and agriculture products to ensure conformance with target export country's food standards and providing guidance to Sri Lankan food and agriculture industry firms in foreign food standard requirements.

- Assistance to provide an environmental impact assessment of the entire Mission portfolio.
- Sponsorship of a national agricultural planning seminar or seminar series to enhance communications and discussions among agriculture policy groups and to foster long-term planning for the agriculture sector.
- Technical assistance to microenterprise food processors in good manufacturing practices, food technology, and export quality enhancement.
- Technical assistance in basic postharvest handling techniques for fresh fruit and vegetable producers and processors.
- Assistance with the development of a national food inspection and food standards system. An initial focus could be to develop food standards for key Sri Lankan commodities and processed food products followed by a program to implement basic inspection and hygiene standards within the processing industry. Also to be considered are basic training programs in retail and food service food hygiene.
- Conducting a regional workshop on phytosanitary barriers to trade.
- Provide technical assistance to the gherkin industry: provide capabilities for literature review/data provision in IPM and biological pest control and assistance with enhanced production practices and pesticide residue minimization.
- Assistance in the acquisition of survey data with farmers to document agrochemical usage patterns.
- Assist CARE and other NGOs in training farmer organizations in the safe use of pesticides.
- Conduct market analysis for approximately 12 NTAEs with a focus on the Middle East and Europe.
- Provide technical assistance in efficient fertilizer and pesticide usage for key NTAEs and for organic production techniques.

Priority Areas for RAP Involvement

The Mission had considered employing RAP assistance in two important areas related to the environment/food safety component: an environmental overview of the entire Mission portfolio, and an assessment of public sector laboratory capabilities. Subsequent Mission decisions gave these assignments to entities outside of RAP.

Despite that discouraging start, it was still important for RAP to find ways to support the AgEnt project directly (since MARD and MED were scheduled for shutdown in mid-1995). Unfortunately, AgEnt does not have many priorities that fall within environment and food safety. This is because AgEnt is designed to provide support to firms through a matching grants program that is highly oriented to attracting new business, finding foreign buyers, finding foreign investors, and finding the appropriate equipment/technologies so that clients (primarily processors) can scale up their production base. Because of the shared investment scenario, an extremely close relationship is established between the project and the clients, such that most supplemental assistance efforts (such as RAP) are deemed inappropriate and superfluous. Despite this "challenging" environment, it is hoped that collaborative activities might be pursued with AgEnt in the following areas:

Provision of technical assistance in low technology, wastewater effluent systems for poultry and horticultural processors.

Assistance from RAP's food lab strengthening project to upgrade a central facility (or facilities) already found inadequate by the initial assessment team. Focus would be on pesticide residue testing.

Technical assistance in environmentally friendly, sustainable agricultural technologies for the gherkin and other export-oriented industries.

INDIA

Principal Findings

- A U.S.-India commercial alliance has been established as a result of the visit of Commerce Secretary Brown to India. One of the five work areas with which this program deals is agribusiness. Clarification of the specific work components of this alliance and the opportunities for interfacing with RAP is needed. RAP could play an important role in the strengthening of Indo-U.S. agribusiness linkages.
- The USAID Office of Energy, Environment and Enterprise has a strong interest in identifying key priority environmental issues in agriculture and developing a strategy in which USAID can assist in their resolution. A portion of this strategy is the linkage between environmental sustainability and agribusiness development. There is a strong interest on the part of the Agricultural Commercialization and Enterprise (ACE) Project to link agribusiness development with environmental enhancement.
- There is interest in a model project, implemented through ACE, that would focus on food commodities grown under sound environmental conditions. A project involving the development

of a commercial prototype is of primary interest; the project would incorporate such priority items as pesticides management, fertilizer management, and groundwater quality.

- There is a strong interest by the Trade in Environmental Sciences and Technology (TEST) Project in providing India with access to EPA database information. There is also interest in the implementation of an environmental clearinghouse that would incorporate an on-line information exchange.

- Interest was also expressed in the following areas:

Development of a food export certification program. See Pride of India program discussion below.

Improvement of food testing laboratories, extending the work initiated by the visits of John Weatherwax and George Miller ("Report on Assessment of Pesticide Residue Testing Laboratories of Asia," for USAID, November 1994).

Information assistance on food standards for export products.

- The All India Food Processors Association expressed a need for accessing or obtaining the following types of information on a continuing basis:

Technical scientific information supporting the safety of food additives and pesticides.⁵

Food standards information (pesticide MRLs, allowable food additives, microbiological criteria, labelling, and so forth) for major target export market countries.

The establishment of a center that would test export food products to ensure compliance with foreign food standards and specifications, provide information on foreign food standards to exporting firms, and assist with new product development.

The holding of a food technology update workshop/forum.

Entering into a joint working relationship with a sister organization such as the National Food Processors Association.

- The Agricultural and Processed Food Products Export Development Authority (APEDA) indicated a priority interest in developing fresh fruit and vegetable product postharvest handling and product grade manuals. The focus would be on manuals for specific products using existing technology customized for India. The manual for grapes developed by the U.K. Postharvest Institute was given as a good model. Similar manuals are needed for mangos, bananas, and strawberries in this priority order. Also needed was packaging and product grade standards information for these products.

APEDA indicates a high priority for the development of a certification program for organic foods and has established a committee to develop such a program. APEDA would like to develop a manual for organic marketing and certification of organic foods.

⁵ Access to the EPA database would, in part, fulfill the pesticides portion of this request.

The need for assistance in implementing safe pesticide use practices including proper pesticide selection, spray intervals, and residue monitoring was noted. Priority would be given to grapes and lychees.

APEDA indicated support for an export certification program. The preferred approach of APEDA would be to develop a series of laboratories that could test and certify product for export.⁶

Interest was also expressed in:

Developing hygienic standards for meat, especially for the Middle East export market.

Establishing a dairy products testing laboratory.

- The Indian Planning Commission has set the following long-term strategies for agricultural growth:

Assuring that agricultural practices provide for sustainable agriculture.

Providing adequate and balanced nutrition for the population.

Strengthening the market infrastructure and production increases in certain key areas including milk and fisheries.

Key areas noted where RAP assistance would be beneficial were as follows:

Improving the infrastructure for pesticide residue analysis.

Enhancing food inspection capabilities.

Implementation of IPM.

- The Bureau of Indian Standards (BIS) is the national agency that establishes compositional standards for processed foods. The standards incorporate basic food safety elements. The list of standards examined indicates that the standards covered basic dairy, fruit, vegetable, and meat items. Standards are also developed for food additives and pesticides.⁷

The agency also carries out certification of products on a voluntary fee for service basis. BIS is also the primary implementing body for ISO 9000 in India.

The agency has recently implemented an ECOMARK certification program. To obtain the mark, a product must be produced under environmentally sound practices. For food this requires meeting pesticide residue MRLs, being free of adulteration, and using biodegradable packaging. No food products currently have the ECOMARK. Although the requirements of the ECOMARK

⁶ In later meetings, the plan for APEDA to establish seven regional laboratories was mentioned. This plan should be verified and coordinated with the Pride of India program, should this program be implemented.

⁷ Subsequent discussion with representatives of several organizations indicated that the effectiveness of these standards for Indian product quality and safety is limited.

are not particularly rigorous, RAP should consider the incorporation of this program (including the establishment of specific standards) within its Pride of India program.

- The Industrial Credit and Investment Corporation of India Ltd. (ICICI) indicated that its primary operating philosophy for agribusiness development was economic viability of the entity. They indicated they will supply the same philosophy with respect to support for RAP-initiated projects; that is, any environmentally related project undertaken for RAP must also have clear economic viability, if not for the short run, then clearly for the long run.

ICICI indicated that it had an interest in the development of a world class laboratory/export certification facility. ICICI had previously considered such a facility in Pune (likely with the National Chemistry Laboratory — see below) but had not pursued the project because it did not appear that a regional facility had sufficient business to support itself. However, ICICI indicated it could support such a concept as long it was economically viable and suggested the implementation of a feasibility study by RAP for such a center/laboratory.

- Several private analytical testing laboratories were visited. The management staff at these facilities agreed on most of the following points:

India has been much more active in expanding its food and agricultural markets in the last 2-3 years.

The government does not have adequate inspection and testing capability.

Few food standards exist in India and, for the most part, those that exist are not enforced, primarily because of extensive food need.

Agricultural quality standards exist for many commodities but these are also not enforced.

There is a great need for providing a laboratory that can test for world-class exports.

A significant pesticide residue problem exists for fresh agricultural commodities. Indicated also were serious problems with water potability, and excessive bacterial problems. No market basket study of foods for pesticide residues has been done.

All the laboratories we visited supported the export certification program concept suggested by RAP and felt that in addition to improved and more accessible laboratory testing services, the program should extend to crop management at the field level. The substance of this discussion was important in the development of the Pride of India concept.

- The Grape Exporters Association is made up of 16,000 growers in India with an average farm size of 1 hectare. Indian grape production is approximately 30 years old. Annual production is 400,000 tons with the bulk sold domestically; the export market is approximately 20,000 tons annually. Although almost all grapes grown are generically Thompson seedless, the industry comprises multiple strains of the variety. Primary export markets are the Middle East, Western Europe, and the Far East (primarily China). Although significant effort has been put into technology improvement over the past 2-3 years, the industry is still plagued by numerous difficulties, including:

Postharvest difficulties including inadequate field cooling, inadequate chilled truck transportation, poor roads leading to extending transport times, inadequate grading and sorting facilities, and inadequate chilled storage including port storage.

Extensive sorting and recombining made necessary by the multiple strains of Thompson seedless grown.

Inappropriate pesticide use without an easy ability to control and monitor this use.

Lack of adequate packaging material to prevent damage during shipment.

No comprehensive expert technical review of the industry to help resolve these difficulties has been made. The conclusion of our discussion was that such a review would be highly beneficial to the future of the industry.

The association also noted:

Plans for the establishment of a grape experiment/research station near Pune.

Interest in initiating commercial crop production of bananas.

Interest in the export certification program (it noted that the program had to be broader than just the grape industry for long-term financial success). Other areas suggested for inclusion in the program included mangos, apples, and pomegranates.

- The Mahama Phule Agriculture University focuses on teaching, research, and extension to support high-value commodity enhancement for both rain fed and irrigated crops. Emphasis is placed on postharvest and processed product improvement for both domestic and export markets. An additional focus is on pesticide and fertilizer control. The policy of the university is to provide research capabilities and resources to train the trainer; it is not involved in direct extension activities.

The university is also a component member of the All India Coordinated Research Project on Pesticide Residues. This project involves the analysis of selected commodities for specific pesticides by several institutions in approximately four states. The areas are chosen because they are representative of Indian agriculture. Also involved is the assessment of preharvest intervals to assure the absence of excessive residues. The All India project is coordinated by the India Agriculture Research Institute. Each participating institution is assigned crop/pesticide combinations for assessment. This institution's current assignments appeared to be vegetable commodities including okra, tomato, cauliflower, cabbage, and Indian ethnic vegetables. Pesticides involved for monitoring were chlorinated hydrocarbons, several fungicides, and selected other compounds including several organophosphate pesticides.

Pesticide laboratory representatives emphasized that pesticide misuse in India was not as great as presumed by most foreigners. They indicated that of some 200 samples analyzed annually by the laboratory, 50 percent had detectable residues but only 5 percent had residues over tolerance (this percentage is substantially higher than the U.S. percentage). No substantive discussion occurred on the basic laboratory capability, representativeness of the samples, or the quality of analytical results; these factors must be considered when examining this area. This was one of

the first of many conversations on pesticide use. See other meeting summaries as well as the concluding comments on this area below.

- The National Chemical Laboratory (NCL) provides basic technical research and development expertise for India for the chemical field. The Organic Chemistry Division of NCL has a significant but limited involvement in agriculture; NCL has assisted the agricultural chemistry industry in pesticides development, has worked with plant growth regulator development for the grape industry, and has assisted the teak and bamboo industry in plant tissue culture development. Approximately 50 percent of the NCL funding is from contract research for the private sector; there appears to be a reasonably good linkage between NCL and the chemical industry.

The Organic Chemistry Division of NCL has been asked to provide pesticide residue analytical assistance to the Indian Food Industry. A limited amount of work has been done in this regard (40 samples in the past six months) on a fee-for-service basis. Existing pesticide residue capability is limited (see Weatherwax/Miller report); however, the basic technical capability (level of trained individuals, existing facilities, and so on) is such that upgrading (specific pesticides training, additional equipment) of NCL to meaningful performance levels in pesticide residue work is worth serious consideration. Additionally, the placement of NCL within the Indian government provides the basis for considering this laboratory as a possible reference laboratory for pesticide/export laboratory certification programs, should this approach be considered.

Discussions have taken place between NCL and ICICI about upgrading NCL's pesticide residue program. ICICI apparently indicated that they would be willing to provide load funds for equipment purchase. Note the above discussions with ICICI, however, where this discussion has been halted pending a determination of the economic feasibility of the export certification work. NCL has also had some discussion with APEDA on export testing of foods for pesticide residues.

The NCL representative made the following points on export product testing:

The private laboratory capability in India is inadequate with poorly equipped laboratories.

Certificates on pesticide residues are sometimes given without complete testing or, occasionally, even without a sample being submitted.

Exporters don't care whether public or private laboratories do the work, just as long as the work is accurate.

- Mahagrapes is an export market organization for several grape growing cooperatives in Maharashtra state. The organization develops export markets for fresh table grapes and facilitates the movement of grapes from India to the target export country. Major points from the meeting with this organization were the following:

Primary fresh grape export markets are Western Europe and the Middle East.

Exporting began 10 years ago with the Middle East market and extended into Europe some 4 years ago.

Current grape production in India is 400,000 tons of which only 20,000 tons are exported. India is not particularly cost-effective in the export market primarily because of the high cost of input

(pesticides, fertilizers). Mahagrapes represents about 30 percent of the grapes exported from India.

Pesticide residues are an important issue with this organization. Pesticide for export product is used during the first half to two-thirds of the four-month growing cycle. Normally, pesticides are used during the first two months of the growing season with little or no pesticides used in the last half of the season. However, pesticide use is dependent upon the weather, with rain creating the need for enhanced fungicide use. It was indicated that in spite of seminars and training, pesticide misuse is still a problem.

U.K. supermarket importers have worked with Mahagrapes in preventing pesticide residue import problems. Pesticide residue testing has been undertaken by U.K. importers. Additionally they have provided Mahagrapes with a quality manual that itemizes out recommendations for field assessment, quality control during packaging, labelling requirements, U.K. pesticide MRL requirements, and recordkeeping and documentation requirements.

Mahagrapes indicated several areas constraining trade, specifically:

- The perception among importers in developed countries that India has a pesticide problem and a food hygiene problem. Even when such areas are controlled, the perception prevails and prevents the acceptance and purchase of Indian products.*
- The lack of the ability to obtain newer fungicides from multinational pesticide manufacturers. Mahagrapes believes this is due to the unwillingness of the manufacturers to supply product to a market where imitation products may be developed and sold domestically and regionally in violation of patent protection.*

Major constraints within the industry today include the export market and fungicide registration needs indicated above plus an improved disease forecasting system.

Strong interest in the export enhancement/laboratory testing program was expressed. An overall quality export enhancement program including field management, proper postharvest handling, and export lab testing for pesticides, when developed in assistance with U.S. experts and clearly communicated, would greatly assist in the overcoming of adverse market perception problems facing India. Mahagrapes could offer a nucleus of highly controlled grapegrowers for such a program.

- **The Central Food Technological Research Institute (CFTRI) is the federal center for food processing technology and development. It was established in 1950 and has worked to develop India's processed food industry since that time. The Infestation Control and Protectants Department was established to provide research and guidance to the food industry in pest control. In recent times, the department has taken on added responsibility in pesticide reduction. It maintains research programs on biocontrol and pesticide alternative programs and serves as a**

resource to the food industry in conducting limited pesticide residue analysis for export product (similar to NCL).⁸

The CFTRI meeting focused on pesticides issues in India. The important findings of this meeting were the following:

India does not have a well-defined monitoring system. There should be a national level comprehensive program in this regard.

Fifty to 60 percent of India pesticide usage occurs in the north with primary use on wheat, rice, and sugar cane. Some 75-80,000 tons of pesticide are used annually in India.

There are 138 pesticides registered for use in India. Of these, 2 chemicals, lindane (including all HCH isomers) and DDT account for 50 percent of all pesticide usage.

Lindane and DDT are not registered for use on agricultural commodities. They are, however, allowed for use for health control (malaria). Hence, they are available throughout the country and are misused on agricultural commodities.

The overall use of pesticides in India is low — approximately 400 grams of active substance per acre. Total pesticide production is less than in the past, acreage treated is less, concentrate per application is lower, but misuse is high.

Although awareness of pesticide misuse is increasing, unless another broad spectrum pesticide of sufficiently low cost is developed, the problem of continuing misuse of HCH and DDT will continue. No work on such a pesticide is occurring to date.

Work at CFTRI on HCH has focused on the environmental fate of HCH.

The residue levels of HCH are generally low, from 0.1 to 5 ppm. No dietary intake analysis has been done to determine exposure or estimate risk to the population.

Pesticides have not had a particularly high national priority in health concerns because so many other adverse health and nutritional problems face the population.

No routine food monitoring is done within India.

The Government of India is planning to set up an Institute of Food Safety within CFTRI. The institute will deal with pesticide residue, aflatoxin, and heavy metal issues. The role of the institute is to both monitor and do research. Parties involved with the institute include CFTRI; the Ministry of Food Processing, the parent organization of CFTRI; CISIR; and the Department of Biochemistry. Funding is to come from these organizations.

⁸ A brief introductory discussion was held with Dr. Parpia, the former head of CFTRI (1964-1976). He also has worked in Rome for the FAO, in New York for the United Nations, and in Tokyo with the U.N. University — all in food technology and processing/management. He is a world-recognized figure in this area. He is U.S. educated (Oregon State) and well known to most senior U.S. academic food technologists. He appears to be well recognized and accepted as a significant individual in India. RAP should consider approaching Dr. Parpia as an advisor to its environmental component.

The department has been involved in the testing of export product for pesticide residue analysis. This work is done at the request of exporters and is carried out on a fee-for-service basis. Testing to date has primarily involved basmati rice, coffee, spices, cashews, and mango.

Export countries are demanding export certificates on pesticide residues. There is an urgent need for upgrading of laboratories: facilities, instrumentation, and training.

The department has a cooperative program with CSIRO of Australia to develop rapid tests for DDT and HCH. These involve immuno-assay techniques. India has asked CSIRO to incorporate the development of antibodies to DDT and HCH in their overall program.

- The Indian Institute of Horticultural Research is the lead federal government horticultural research organization. The institute has three substations in other climatic areas of India. The focus of the headquarters' site is tropical and sub-tropical plants- fruits, vegetables, flowers, medicinal herbs, ornamentals. The institute is basically organized according to broad plant types and disciplines; it is composed of 12 divisions: fruit crops, vegetables, ornamentals, medicinal herbs, plant pathology, entomology, soil science, extension and training, biotechnology, postharvest technology, plant genetics, and agricultural economics.

The past focus of the institute has been on increasing crop yield. Beginning five years ago, the direction changed to incorporate major activities relating to the development of pest-resistant varietal development. Thus the focus of the work of the institute today encompasses pest resistance with a maintenance or enhancement of yield for agricultural commodities.

The institute does little work per se on pesticide minimization or IPM other than the pest resistance work. However, the institute is part of the All India Coordinated Research Project on Pesticide Residues. The team was provided with a copy of the annual report for 1991-93 for this institute; the report had been submitted to the lead administrative organization, the Indian Agricultural Research Institute (IARI).⁹ The capabilities of the pesticide residue laboratory are limited; it is primarily involved with chlorinated hydrocarbon residue analysis.

USAID supported a mango postharvest technology program in the institute. Substantial laboratory equipment, including at least one gas liquid chromatograph, was purchased under this program. The institute also received a USAID grant to implement a new horticultural processed products laboratory and small pilot plant. Equipment for this laboratory was being installed at the time of the visit. The understanding is that this facility will be a postharvest, processed-product development laboratory doing contract research for the regional food industry.

Institute representatives noted the following about pesticides:

Pesticide use is an issue. For a variety of reasons (protection of crop investment, yield enhancement) growers will use pesticide when needed to ensure protection from pests. The availability of higher-cost hybrid seed (with a need to ensure adequate yields) exacerbates the misuse situation. Usually the cheapest available pesticide is used with recommendations from dealers or fellow growers. Little control exists among domestic food producers whereas export driven markets exercise more control.

⁹ Copies of reports from all participants and the total program can be obtained from IARI. Contact Dr. S.K. Handa, Project Coordinator, Pesticide Residues, Division of Agricultural Chemicals, New Delhi 12, India 110012.

The institute has worked with the grape growers on cultivation practices (including those related to pesticide reduction) and varietal selection.

The institute has significant activities relating to watershed protection including work relating to cultivation practices, crop selection, and pesticide management.

The institute has adopted a damage assessment approach to determining time of pesticide application. For uneducated farmers, it believes this approach is preferable to an economic threshold approach where greater levels of education are needed to adequately identify pests.

The institute has used neem extract (aqueous extract of ground seeds) in their crop protection program.

A need exists for a market basket survey of fresh fruits and vegetables for pesticide residues. Accompanying this is a need for additional laboratory capability and upgrading including instrumentation and training.

There is a need also for increased dissemination of pest management information to growers.

The institute agreed that a food quality product certification program would be beneficial but indicated that it would work only on export product and not for domestic product. For domestic product it would be very difficult to certify the extensive amount of product sold; additionally, because consumer interest is in availability and price, not quality and residue control, there would be little driving force for a domestic product certification program.

Opportunities Identified

The assessment of this fact-finding visit with respect to opportunities to improved environmental/food safety issues is complex because of the variety of issues that arose, the differences of opinion that occurred on some issues, and the challenges (magnitude of problem, infrastructure capability, resource availability, political complexity) faced by India in this area. Findings about opportunities identified can be grouped in three areas: pesticide residues, infrastructure-related enhancements, and technical information and training needs.

India Pesticide Residue Issues

The perception outside India is that a serious pesticide misuse problem exists in India. This perception includes use of banned (for food use) chlorinated hydrocarbon pesticides on food crops and the general misuse (incorrect dilution, incorrect frequency of application, and so forth) of chemicals.

The perception within India, based on the team's visits, is mixed. Although there is a general agreement that pesticide residue testing capability in India can be improved (see below) and that effort is needed in applicator training, opinion differs on the actual level and seriousness of the pesticide problem. At least one senior government official voiced a question as to whether government priorities should include pesticides when the real issue is trying to feed the nation.

The position of several individuals (primarily associated with government entities) was that pesticide use on a per-acre basis is low, that economics prevents excessive pesticide use, and that the

perceived pesticide problem is the result of a few incidents of misuse. Exporters, grower associations, and food processors, with other governmental individuals, although concurring with low per-acre overall pesticide use figures, indicated that serious misuse occurred (particularly with DDT and lindane) and that application knowledge among individuals is generally poor.

The exact situation with respect to the pesticide issue is difficult to ascertain because of the absence of any national market basket survey of pesticide residues, the existence of relatively few pesticide residue laboratories, and the limited capabilities (and creditability) of those that do exist.

From an export standpoint, the pesticide problem was best summarized by a grape exporter. He noted that there is a perception problem among importers (especially in developed countries) that India has a pesticide problem and that this perception problem either prevents the acceptance of product for import, necessitates re-testing at the port of entry at additional cost, or requires the exporter to accept a lower cost for the product.

From the visits undertaken, the actual pesticide situation is likely to be something similar to the following:

Overall pesticide use in India is, in fact, low (400 grams of active ingredient per acre).

Although 138 pesticides are registered for use in India, 2 chemicals, DDT and lindane (all HCH isomers), account for 50 percent of all pesticide use.

DDT and lindane/HCH are not registered for use on food crops. They are permitted for use in malaria control. As such they are available throughout India at the local level. The cost of these two compounds is low.

Growers have little training in assessing pest levels and apply whenever they believe their crop is threatened. Because of the major economic impact on growers of crop failure, there is a tendency to ensure that pests are not the cause of a crop failure (particularly if the farmer is using a higher-cost hybrid seed).

Because DDT and lindane/HCH are readily available locally, are low cost, are efficacious for most pests, and few or no controls are placed on their sale, these materials are the pesticides of choice for the grower.

HCH exacerbates the situation because although its cost is quite low, its content of the main pesticidal material is also low; hence, more of the material must be used to obtain pest control, thus increasing the food and environmental residues.

It is unlikely that this situation will change soon. As noted above, little residue monitoring is done. The need for food and the nutrition and health priorities of India are such that the likelihood of placing pesticides higher in the priority list of concerns is low.

RAP's impact is probably best achieved by the following.

Improving laboratory analytical capability for pesticides.

Encouraging the further development of a national pesticide monitoring system (expanding the All India Coordinated Research Project on Pesticide Residues into a true national market basket survey).

Focusing on selected export commodities for the development of sound pesticide use practices (proper chemical selection and application practices) that demonstrate environmental sustainability and improve human health.

Food Safety/Quality Infrastructure Enhancements

Mentioned frequently by both government and industry representatives was the need for assistance in developing food safety and quality infrastructure. The Planning Commission noted, for example, the need for improving the infrastructure for pesticide residue analysis and for enhancing food inspection capabilities. Improvement of laboratory analytical capability (both physical facilities including instrumentation and analyst training) was often noted. The need for laboratory enhancement was confirmed by direct visits to several food analytical laboratories and the earlier laboratory assessments undertaken by the Weatherwax/Miller team. Improved food safety and quality systems were also noted by representatives of the All India Food Preservers Association. This food safety/quality infrastructure need was frequently expressed by indicating the need for the establishment of an export food certification center. APEDA indicated the need for the development of postharvest quality and grade manuals and the development of an organic food certification programs. Overall, the development or enhancement of systems to provide for improved food safety and quality was an often-expressed need.

Technical Information and Training Needs

Broad and extensive food safety and food quality technical information and training needs exist in India. From the visits undertaken, the focus of these needs were on the following:

Technology updates in food processing and food safety/quality including HACCP. The All India Food Preservers Association expressed particular interest in a food processing technology update workshop.

Laboratory training in pesticides residue analysis. Training is also necessary in other food areas including microbiology and food chemistry.

Providing technical information supporting the safety of food additives and pesticides. The All India Food Preservers expressed interest in obtaining data packages in this area to assist them in obtaining approval for the use of new food additives.

Technical information on foreign food regulations (in such areas as food additives, pesticide residue, microbiological criteria, and good manufacturing practices) to assist Indian processors and exporters to meet specific target market needs. In some cases (APEDA) specific target needs were identified.

Technical training in food inspection and HACCP.

Priority Areas for RAP Involvement

Based on the assessment visits, the following are key work areas in India for RAP to consider:

1. Feasibility study for a Pride of India food enhancement program in 1-2 key commodity areas. The concept paper for this program integrates a number of the key needs identified from the fact-finding meeting, including:
 - Linkage of agribusiness projects with sustainable, environmentally sound practices.
 - Export product enhancement.
 - Pesticides minimization and control.
 - Laboratory upgrading and analyst training.
 - Providing food technical information in the form of quality/grade manuals, food standards information, and so forth.
 - Improved product safety and quality.

Certain potential RAP work areas (such as APEDA's request for product quality and grade manuals) may be done within the scope of this Pride of India project or separately (see below).

For sustainable success, this program must be economically viable (see comments from ICICI). This means that a clear and comprehensive analysis must be done to identify the practical elements of the program, how many products are to be involved (or need to be involved for success), how many laboratories are needed and where, what remediation or enhancements are needed, how much they will cost, and who is to fund them. The feasibility study will accomplish this need.¹⁰

Other priority work areas for RAP (many of which are also included in the suggested Pride of India program) are the following:

2. Postharvest product quality and grade manuals. Focused on the needs of APEDA, this work area could also incorporate the need of APEDA for information or a manual for organic food certification.
3. Technology update workshop. This would provide update information in food processing and could extend also to food safety and product hygiene.
4. Technical information services to access foreign food regulations, and where appropriate and obtainable, food additive and pesticide safety assessment information.
5. Providing access to relevant EPA databases to appropriate Indian agencies and organizations.

¹⁰ Since so many of the needs identified during the assessment visits are contained in the Pride of India program concept, this work item is given top priority and is presented in detail as a separate item in a following section.

6. Providing access to one or more viticultural and postharvest technical experts to the Indian grape industry to carry out a comprehensive technical review of the industry.
7. Providing technical training services in food inspection (regulatory and voluntary quality programs), good manufacturing practices, and HACCP.
8. Providing upgrading and analyst training for food laboratories (including pesticide residue), in the event that the Pride of India program does not move forward.

Concept Paper: Pride of India Food Enhancement Program

This program would be a high-priority intervention for RAP in India, by helping to ensure food safety and improving food product quality for India's domestic and export markets.

Foods for domestic consumption are often of inferior quality and may present threats to human health. Excessive pesticide residues are a common food safety problem in India. Fresh and semi-processed foods may also contain microbial contamination, including the presence of toxic compounds such as aflatoxin. Product decomposition and spoilage or insect and rodent contamination are also issues of concern, leading to potentially significant losses in consumable foodstuffs.

Export market access for India's fresh and processed agricultural commodities is hindered by the belief among potential importers of Indian food products that products are not safe, wholesome, or of adequate quality. Visits conducted by team members in selected export target markets found a reluctance to import Indian food products because of actual or potential food safety and quality problems, including pesticide residue issues. More than one Indian exporter indicated that even though he exported a safe and wholesome product, there was a reluctance by buyers to accept his statements of product safety and quality and, even if accepted, the products might be purchased at a lower price than similar products from competing countries. Several Indian exporters expressed frustration in having to meet importer demands to have exported products retested upon arrival in foreign markets.

The RAP environmental team, from visits undertaken in India, came to the conclusion that, although India food exporters generally exercise more care in ensuring a safe and wholesome export food product than that shown toward a domestic product, there was still a significant concern that products with improper pesticide residues or potential hygiene problems may, in fact, be exported. This situation is due to multiple factors including nonexistent enforcement of pesticide residue regulations, inadequate pesticide field monitoring efforts, substitution of pesticides that are not allowed for use on food products, lack of adequate laboratory capabilities, lack of good manufacturing practices in processing facilities, and the lack of an understanding of foreign food market entry requirements.

Many of these same factors, particularly those related to good manufacturing practices, as well as others (for example field agricultural practices) are elements impacting adversely on national food security and domestic consumer health.

Based on these observations, the RAP environmental team is recommending for consideration the development of a Pride of India food enhancement program. Assuming a favorable feasibility study, we are suggesting that the program be implemented initially on a limited, focused basis with expansion to follow. We are recommending that the program be implemented through the private sector with policy and operational oversight by the government of India. Additionally, we are recommending the use of

a seal of quality, a **PRIDE OF INDIA** logo, on product that successfully meets the requirements of the program.

A Pride of India program can have multiple benefits for India. Food safety and quality for both domestic and export markets can be enhanced. For the export market, the Pride program can be an economic stimulus. The program will increase the availability of higher-quality products for India's growing middle class; the Pride program can, for this population who have the money to pay for and interest to purchase higher-quality products, serve as an economic stimulus for the domestic economy. Finally, but importantly, the Pride program can assist in developing India-U.S. linkages for the transfer of technology in many areas (commodity production, food safety/quality, laboratory upgrading, reduction of postharvest losses, sustainable agricultural practices, for example) both in expert services and related equipment needs.

Program Goals

The goals of the Pride of India program are to:

- Upgrade the quality and safety of Indian food products through a recognition/certification program.
- Increase the exports of select food commodities.
- Enhance domestic food security through assuring the production of more and safer, more wholesome food products through the reduction of food product losses and more rigorous laboratory testing of product.
- Promote the environmental sustainability of Indian agriculture.
- Enhance business linkages and technology transfer between India and the United States.

Elements That Need to be Addressed

The following elements need to be addressed in developing a Pride of India food enhancement program.

- Development of stakeholders in the program, to include government agencies involved with agriculture, health, export development, food trade, growers and export associations, financial investment organizations, private and public laboratories, and USAID and the ACE project.
- Development of a field pesticide application monitoring program to ensure proper and minimal pesticide use during production.
- Upgrading of several laboratories to provide credible (world class) analytical support. We are recommending that the majority of these laboratories be in the private sector. We recommend that the National Chemical Laboratory (Pune) be developed to serve as a reference and accreditation body for this program.

- Development of specific food product quality manuals for both production and processing to assist in assuring enhancements needed in the growing, harvesting, transporting, processing, and marketing of the product.
- When appropriate, the development of enhanced sanitation programs to protect the hygiene of the product. This component could include use of the HACCP concept.
- Technical assistance to reduce product wastage, spoilage, and decomposition.
- Providing information on food standards (pesticide MRLs, food additive use requirements, phytosanitary documentation requirements, microbiological criteria, and packaging and labeling information, among others).
- Comprehensive training in critical areas such as pesticide use, IPM, organic production techniques and laboratory analyses.

Additionally, the RAP team recommends that for the initial commodity(s) of interest, a comprehensive review of production and postharvest/processing practices be done with an emphasis on environmental sustainability.

Stakeholders

The RAP team recommends consideration of the following entities as stakeholders in the Pride of India program.

Agricultural and Processed Food Products Export Development Authority
 Appropriate Trade and Growers Associations
 Industrial Credit and Investment Corporation of India
 Confederation of Indian Food Trade and Industry
 Private laboratories
 Federation of Indian Commerce and Industry (FICI)
 USAID and ACE

Additional stakeholders include:

Ministry of Food Processing
 Ministry of Agriculture
 Bureau of Indian Standards
 Central Food Technology Research Institute (CFTRI)

Initial Commodity Selection

The RAP team recommends that 2-3 commodities be considered for initial development and inclusion under the Pride of India program. At least one of these commodities should be primarily for domestic consumption.

For the primarily domestic product, the RAP team recommends that a legume/pulse commodity used in the manufacture of Indian-style bread products be considered.

For the export market, RAP recommends that the table grape industry be considered. This industry has already developed a significant domestic and export market and has considerable potential for further growth, an interested trade association and grower base, and has expressed interest in the concept.

Seafood, specifically aquaculture and fresh caught shrimps and prawns, is recommended for consideration as a third commodity. Application of the Pride program to this commodity could substantially help resolve food safety and quality concerns associated with this product.

The team recognizes that certain components of the program, in particular laboratory upgrading, will require investment over and above that needed for a single commodity. It is vital, therefore, that a long-term strategy be developed to ensure the incorporation of other commodities into the program to provide for adequate return on investment.

Approach

The table below gives a schematic overview of the approach suggested for consideration by the RAP team; it delineates project components, the source providers, the funding sources, and the work products. The feasibility study should minimally incorporate the following elements: confirmation of actual Coordinating Council members and Chairman; identification of actual elements of the program (such as field monitoring and certification, laboratory analysis, postharvest practices, and quality manuals and product specifications); identification of initial focus commodity(s); identification of laboratories for upgrading/training; determination of administrative and operating structure of Pride of India program; implementation (including laboratory upgrading) and operating costs and funding mechanisms for the program; and anticipated operating costs and revenues.

Remediation

The following items would be included in the remediation or improvement activities:¹¹

Laboratory upgrading. To include site assessment of selected laboratories, recommendations for improvement, audits of the improvements and provision of necessary training. The provider of services is RAP. Funding provided by the Mission. The work product would be upgraded laboratories. The responsibility for financing equipment and facility upgrades is to be decided but the team recommends that it be done primarily by the private sector with Indian government resources.

Field activities. To include pesticide use management, chemical selection practices, timing/frequency of application, applicator training, application levels, PHIs, safe handling practices, and bio-control. RAP is to be the provider of services and funding is from the Mission. The work product will be improvement in pest management practices and the absence of illegal pesticide residues.

¹¹ It is anticipated that RAP regional events and technical assistance will supplement Mission support of these remedial areas.

APPROACH TO DEVELOPMENT OF PRIDE OF INDIA PROGRAM

Component	Provider	Funding Source	Work Product
Feasibility Study	RAP (teamed with local consultants)	Mission	Assessment Report
Development of Pride of India Coordinating Council	Various involved org.	in-kind	Policy oversight and review
Identification of key domestic elements for enhanced food security and food safety/quality	RAP (teamed with local consultants)	Mission	Assessment Report
Market entry requirements	RAP	RAP core	Food Standards by country
Overview of existing production/marketing practices that enhance or constrain marketing of products.	RAP through partnering with USDA, SUSTAIN	RAP mission	Report
Development of a "Pride of India" food product specification sheet for each product listing parameters to obtain the Pride of India logo	RAP teamed with local consultant, other approp. org., i.e., APEDA	Mission	Pride of India requirement sheet
Identification of participant(s) and initial organization structure.	Mission/APEDA/local org.	Mission	Listing of participants plus structure
Hire Pride of India Executive Director	APEDA	APEDA	Administration of program
Remediation/Improvement	RAP	Mission/RAP	see below for details
Implementation	Various	Various	see below

Postharvest practices. Elements of this section are to be determined following an in-depth review of the selected industry (for example, grapes) carried out by an expert consultant. Provider of service is to be RAP with funding by the Mission. The work product will be improved product quality.

Product Hygiene. This element will include a review of the safety of the water supply (including irrigation water) and a review of field and process practices to avoid contamination with unsafe microorganisms or toxins. Provider is to be RAP with funding by the Mission. The work product will be improved product safety.

The following items are included as recommendations on how the program might be implemented.

Implementation of Pride of India Coordinating Council. This will be a policy and operations oversight board for the program. Membership is to include representatives from APEDA, appropriate growers association, ICICI, selected private laboratories, CIFTI, CFTRI, Ministry of Food Processing, Ministry of Agriculture, Bureau of Indian Standards and NCL. USAID (ACE and/or RAP) to be an ex-officio nonvoting member. The RAP team recommends that Dr. H.A.B. Parpia, former Director of CFTRI, be considered for chairmanship of this group.

Appointment of Executive Director. This individual would be responsible for the administration of the Pride of India program and would also serve as Secretary for the Coordinating Council. It is recommended that consideration be given to seconding an individual from APEDA (and funded in-kind by APEDA) to serve as administrator.

Exporters/Growers Associations responsible for implementation of field activities. The growers or export associations would have the responsibility to carry out the necessary field activities to ensure proper pesticide use and to also ensure that postharvest requirements are carried out. Costs would be recovered on a fee-for-service basis or absorbed by the association as a service to members. The work product would be supervision and enforcement of approved field and postharvest practices.

Laboratory functions. The laboratory would take samples, carry out analyses, and provide certificates. The individual accredited laboratories would have the responsibility to obtain all samples from the field or processing facility, transport the samples to the laboratory, perform the necessary analyses, and issue the appropriate certificate. The certificate would enable a **PRIDE OF INDIA** seal or logo to be associated with the lot of product in question. Costs would be recovered through lab fees. The work product would be correct and certifiable analyses.

Private Pride of India auditor. Mitcon or an equivalent organization would provide a private, independent auditor who would audit all field and laboratory practices to ensure compliance with the Pride of India program. Fees would be charged to users of the service to recover costs. Participation in the audit process would be a mandatory requirement for participation in the program. The work product would be an independent audit of the system to ensure compliance.

APEDA oversight of the entire process. APEDA would provide a final regulatory oversight for the entire system. Costs would be borne by APEDA. The work product would be a final assurance of the integrity of the program.

Development of participant certificates and related activity. Certificates and documentation demonstrating participation in the program and compliance with its requirements would be issued by APEDA. These would include paper certificates, farm signs for use by the growers, and related public demonstration of participation and compliance. Costs would be borne by APEDA. The work product would be active demonstration of participation in the program and public pride and acceptance in the program by the participants and sponsoring organizations.

Marketing and promotion. The Pride of India program is to be promoted by on a national and international basis. News releases through *Market Asia* and other appropriate trade communication channels will be carried out. RAP would additionally assist in public relations promotion of Pride through networking with importing organizations, governments, and other

associations in developed country markets. An initial national announcement is recommended incorporating the support of appropriate Indian and U.S. representatives.¹²

BANGLADESH

Principal Findings

- USAID Mission representatives noted the following key concerns:

Pesticides are a potential issue in Bangladesh. Similar to comments received in India, it was noted that overall pesticide use is low but that misuse is common — illegal pesticide use, incorrect application, improper timing of applications, drift, and so forth). Use of chlorinated hydrocarbon (primarily DDT and HCH) is an issue in Bangladesh as it is in India. Eighty percent of pesticide use occurs on rice with much of the remaining 20 percent used on tea and sugarcane. Of current concern is the use of DDT on dried fish for fly control.

Interest was expressed in the need for laboratory upgrading. A major focus of potential Mission interest was food/pesticides/environmental laboratory capability assessment and a feasibility study for upgrading of laboratories. Interest was also expressed in the monitoring of marketplace samples for pesticide residue. Also expressed was the need for food standards information. Some limited discussion of the export enhancement program concept developed for India took place, with interest expressed by the Mission. The general feeling was that the Bangladeshi needs were more clearly focused on simple laboratory upgrading and basic training in safe, efficient use of pesticides. Interest was also expressed in providing HACCP assistance, particularly in seafood.

Mission representatives also viewed RAP as a potential source of market information and as a source of information on new technology. Laboratory upgrading could be included within the new technology definition. The representatives were not yet completely clear as to how the environmental component could fit into the Agrobased Industries and Technology Development Project (ATDP), which has as its focus fertilizer uses/technology and general agriculture technology transfer. RAP needs to be innovative with this project in this regard (consider HACCP as "new technology").

- A visit with ATDP revealed that a series of recent funding decreases (\$80 million down to \$30 million) have resulted in a serious rethinking of strategies and activities for the project. The chief of party (COP) indicated the current thinking for the project is to focus on some 4-6 (each) food processors and exporters to enhance their capabilities (growing, processing, market access).

The COP also noted existing weaknesses with the agriculture sector, including the absence of public laws and regulations, the lack of public enforcement infrastructure in agriculture including food safety inspection and laboratory capability, and the existence of significant pre- and postharvest issues including pesticides control and processing infrastructure. Of note also was

¹² A list of literature items relevant to the Pride of India program is at the end of the text in the References section.

the complete absence of grades or standards for fresh and processed agricultural commodities and the need for substantive food safety and food market access information.

The COP noted that, because of the changes occurring within the structure of the project, the final project activities have not been determined and no decision could be made at that time regarding interaction between ATDP and RAP. It was noted, however, that a relationship is possible and would be beneficial.

- At the Bangladesh Ministry of the Environment we learned that a new environmental legislative initiative was recently passed in Bangladesh (copy obtained). It is planned to implement the legislation immediately. Comment from the Ministry of the Environment indicated the priority of the legislation is air, soil, and water environmental quality standards. The food sector is included in the effluent area.

The ministry representative (Deputy Director General) indicated that there would be interest in including food safety as a component of the implementing regulations. RAP should consider involvement in this area.

The World Bank is assisting with the implementation of the environmental regulations and program. To date, this involvement has not included the food sector.

The ministry does maintain four laboratories, one primary laboratory in Dhaka plus three other regional laboratories. Observation of the Dhaka laboratory indicated that the facility was marginal in operational capability. Significant laboratory enhancement will be needed to make the facility sufficiently operational to carry out its mandated activities. RAP assistance would be beneficial in this regard.

- Representatives from a group of leading seafood exporters informed us that Bangladesh is currently exporting (all firms) 30,000 metric tons of seafood; 80 percent of the seafood exports is black tiger prawns and 20 percent fresh water prawns. Approximately 35 percent of the export goes to Japan, 10 percent to the UK, and the balance (55 percent) to the United States. RAP obtained a listing of all seafood exporters from Bangladesh, with their export tonnage and volume.

The shrimp industry is revamping operations, upgrading processing facilities, and putting in many new culturing ponds. A new trend is for exporters who previously purchased from contract growers but found quality as well as cost to be an issue are building their own ponds. Currently, prawns are a sellers market in Bangladesh, hence the thrust to build ponds, reduce dependency on outside sources (and high purchase prices), and cut their production costs. The company, based on discussion only, appears to have in place a significant quality assurance program.

Some companies are beginning to implement HACCP but are not at the ready stage. Also it appears that analytical testing (for microbiology) is done only occasionally; exporters rely on government testing for the bulk of their analytical work (see below). Key quality/safety issues have historically been salmonella, filth, and decomposition. This finding corresponds with import detention issues cited by FDA.

It was noted that the Bangladesh government (Ministry of Livestock and Fisheries) maintains a mandatory testing of export seafood lots for salmonella. No formal HACCP program is maintained by the industry or by the government, however. Additionally, no initiative has been

taken by the industry or the government to begin planning for the FDA Seafood HACCP program.

Although it was indicated that salmonella laboratory capability in Bangladesh was adequate, additional microbiological and chemical testing capability is needed. It was also noted that no waste product or effluent controls are employed by the industry. Wastewater is released into the environment and waste shrimp parts are merely dumped into the open.

The primary needs for this industry appear to be three:

Assistance in HACCP readiness including the FDA seafood HACCP seminar and additional training perhaps coordinated through the Bangladesh Frozen Food Association.

Laboratory enhancements, especially for filth/foreign material analysis.

Assistance in designing and implementing basic effluent and shrimp waste controls.

- The Pesticides Association of Bangladesh has 35 members of which 20 are actively engaged in the pesticides formulation business or are providers of formulated material. There are currently 500 pesticides distributors and 5,000 pesticides dealers in Bangladesh. About 60 percent of the distributors are "exclusive" — dealing with only one company. The total number of pesticide distribution points in Bangladesh was indicated to be 20-25.

The Bangladesh pesticide registration procedure is similar to the FAO Code of Conduct and is administered by the Pesticides Technical Advisory Committee within the Ministry of Agriculture.

Some pesticides training has been undertaken in Bangladesh. The Pesticides Association has developed courses for dealers and training information for farmers and students (to educate their peasant parents). Thus far, the training efforts have been only modest with some 600 people trained — one-third being dealers and the rest farmers. Target trainees are 5,000 dealers, 50,000 farmers, and 100,000 students. No students have been trained to date. The industry has been trying to work with GIFAP (the international pesticides training organization) but little success has been achieved in this regard.

Indicated was the fact that little communication exists between the Ministry of Agriculture (responsible for pesticides) and the Ministry of Environment (responsible for implementing environmental law, including a pesticides component). This lack of communication, as well as the belief of each agency that the other does not have the capability to serve as a competent authority, was indicated to be a major problem.

Voiced was support for the development of regional laboratories. The need for 3-4 laboratories was suggested to provide effective analytical services to the Bangladesh food industry. The association would be supportive of a program in this area.

Noted by the association was work Ciba Geigy was doing on an eggplant IPM program. The project focuses on the development of economic threshold application levels (difficult because the ETH changes with location and with the specific time in the season), impact on beneficial insects, economic threshold levels, and crop pesticide residue levels.

The association noted that no pesticide container disposal work had been done in Bangladesh.

The association indicated priority work areas for RAP were two:

Assistance with pesticide training for applicators and farmers. A brief discussion on a training video was conducted.

Development of testing laboratories (plus some type of requirement to, in fact, use the laboratories).

- Talks with representatives from the food processing sector revealed the following general needs:

Marketing information on Middle Eastern markets including product quality specifications for processed products.¹³

Information on sourcing used laboratory and food processing equipment.¹⁴

Information on composting of fruit and vegetable process waste.

Organic food production information.

SASSO (Saudi Arabia Specification and Standards Organization) food standards information. This information can be obtained from the USDA FAS Office of Food Safety and Technical Services.

- RAP assisted at an agribusiness and environment seminar on the integration of environment and agribusiness, held at the Business Advisory Service Center (BASC). Presentations by the RAP team on topics similar to those covered in the New Delhi seminar were carried out. The following discussion comments were made:

Limited pesticide use occurs in Bangladesh but misuse is clearly a problem. Pesticide applications in Bangladesh amount to 30 grams per acre/year. Most of the materials applied are organophosphates. Chlorinated hydrocarbons are used on sugarcane and tea. Approximately 25 percent of the farmers apply pesticides. Application rates are high for vegetable crops.

IPM efforts on rice are not needed. Significant efforts have been made in this area and application needs are less than for fruits and vegetables. IPM efforts need to be placed especially on mangos, bananas, and vegetables.

Meaningful application of IPM is difficult. FAO activities are normally focused on the government sector, which is generally ineffective. Work with grower cooperatives has also proved ineffective. What is needed is a means to work effectively with dealers and direct growers; industry representatives expressed frustration at trying to reach these sectors with meaningful

¹³ There appears to be a need to match the market information needs and the quality specifications to the technical production needs that can be addressed by the environmental component of RAP.

¹⁴ RAP should consider developing a list of the several U.S. suppliers of this equipment to provide to Bangladesh and other RAP countries.

programs. Pictorial education on pesticide use has been tried and proved unsuccessful; direct verbal instruction is best. The discussion was left at the point of trying to develop an effective program to reach growers and dealers.

Industry representatives indicated that they were not especially interested in RAP providing success stories from other countries. They were much more interested in RAP working with them on niche market development, both from a marketing information aspect as well as technical assistance in pesticides, product quality, and laboratories.

Laboratory improvement was of interest to all attendees. It was indicated that no private laboratory existed for the food industry. Public laboratories are inadequate in their capabilities and are not readily accessible to the private sector. Agreement was general that development of one more private side laboratories was important. These should be regional labs. Also likely to be important is the upgrading of one or more public laboratories.

Opportunities Identified

- The general level of need for Bangladesh is more basic than that for other RAP countries such as India, Indonesia, and the Philippines. This holds true for all RAP environmental sectors including pesticides, food safety and quality, and the environmental area including waste effluent.
- Food safety and quality is an issue in Bangladesh but clearly at more of an entry level than most other RAP countries. Food processing (except for the fisheries area) is limited to simple technology; this is especially true for the fruit and vegetable area. In fact, there is very little fruit and vegetable processing in Bangladesh. What appears to be needed for this sector are many items including professional consultant assistance in food technology, model food plant and laboratory designs (including plant layout, construction materials, typical equipment and laboratory needs), and waste effluent technology. Because so little food processing exists in Bangladesh and because there exists a sizeable fresh agricultural economy and population, there appears to be a true opportunity for RAP assistance to develop this sector, both for the domestic and export markets. Such an effort can have a significant positive impact on the health and nutrition of the population.
- All that can be said for the domestic side can also be said from the export side, but more so. In addition to the comments above, additional information is needed on foreign food standards, particularly for the Middle East market, as well as assistance in HACCP and laboratory capability.
- Pesticide use is an issue in Bangladesh as it is in every other RAP country. Although most problems are similar to other RAP countries, some areas, particularly that of pesticides analysis, are areas of great need. Problems in the uncontrolled use of chlorinated hydrocarbon pesticides, other pesticide misuse, and lack of applicator training are all problems in which RAP can be of assistance.
- The laboratory situation in Bangladesh appears to be marginal and a true area of need. No pesticide or environmental testing capability appears to exist in the country. Basic microbiological testing, focused primarily on the seafood industry (salmonella testing) exists, but extension of this test area is needed also. No competent laboratory exists that can readily evaluate export commodities. Repeated expression of need for adequate laboratory capability in

Bangladesh was made during the fact-finding mission. It is worthy of note that improved laboratory capability benefits both the domestic sector as well as the export sector in so far as improving human health and the environment.

- It is of interest that Bangladesh is implementing new environmental legislation. Of particular note is the comment from the Deputy Director of the Ministry of the Environment to consider incorporating a food safety and food processing plant environmental component into the implementing regulations of this legislation. RAP should encourage this initiative and be a participant in the process. Such activity can have far-reaching benefit both domestically (for human health and agribusiness) and for the export area.
- Seafood is the major export commodity of Bangladesh. Virtually 100 percent of all seafood exports go to developed countries — Japan, the United States and Europe (55 percent to the United States). HACCP is becoming a key need in this international trade area. However, from discussions, it appears that the Bangladesh seafood industry has not moved forward appreciably with HACCP. Further, the government of Bangladesh has not provided either initiative or resources for this key export area. To ensure a continued export fisheries market, Bangladesh should expedite activities in HACCP. RAP can be of significant assistance in this regard.
- Little waste effluent control exists. This is a further area of potential RAP assistance. Additionally, our observation (limited as it was) of the domestic fresh water aquaculture business indicates that substantial assistance could be provided to enhance production and disease control in this area. Such work can be of significant benefit to the domestic human health and economy.
- In summary, ample opportunity and need exists for RAP in the agriculture and environmental sector. Basic needs exist in food processing, pesticides, laboratory, waste effluent, food safety program regulatory program development, and technical transfer assistance for which RAP can be a supplier or catalyst in providing needed services. All of the above areas have major positive impact potential for improved domestic health, improved domestic economics, improved domestic environment, and in expanding export-related agribusiness.

Priority Areas for RAP Involvement

- Assistance with the development of food safety regulations implemented through the Ministry of the Environment.
- Development of and providing model plans for basic fruit and vegetable processing plants, including plant layout, construction material, processing equipment, and laboratory design and operation.
- Providing information on sources for used equipment for food processing, waste effluent, and laboratory analysis.
- Assistance with chemical (including pesticides) and microbiological laboratory enhancement including analyst training. This can probably best be accomplished by a preliminary (feasibility) study to identify precise needs and resource requirements. The study should incorporate a review of the establishment of a central facility associated with agricultural export.
- Providing assistance in seafood HACCP to the fisheries export industry.

- Providing consultant assistance in multiple areas including fruit and vegetable processing, waste effluent treatment and composting.
- Assistance in technology transfer (updating) for the food and agricultural and environmental areas.
- Assistance with proper pesticides application with a focus on basic applicator training and pesticide use.

ISSUES IDENTIFIED BY WASHINGTON-BASED GOVERNMENT AGENCIES

This section presents findings from a selected series of meetings between RAP and (primarily) U.S. Government agencies to find out their perspective on the environmental/food safety barriers to trade in the RAP countries. These were also opportunities for RAP to query these agencies about meaningful mechanisms for RAP intervention in these problem areas. These meetings were conducted before the RAP environmental team had a chance to visit the region to conduct field visits.

USAID ASIA/NEAR EAST BUREAU ENVIRONMENT/AGRICULTURE STAFF

A lengthy discussion took place among meeting participants on the following topic areas: a Food Processing Workshop for Low Acid Canned Foods, the Sri Lankan pesticide residue laboratory evaluation project, HACCP/ISO 9000 programs, RAP/EC Needs Analysis/Inventory Project, and the Indonesia cocoa IPM project. A summary of each subject is presented below. Participants agreed that as many of these projects as possible should be initiated as soon as feasible to give the environmental component of RAP a rapid and visible start-up.

Food Processing Workshop for Low Acid Canned Foods

The need for a food processing workshop for low acid canned foods was identified as a priority for Indonesia. The processed foods workshop is conducted to train cannery workers in retort and related cannery operations needed to insure the safe processing of foods. This course is vital to the successful acceptance of foods by the FDA. The discussion of the group indicated the likely need for a course of this type in countries other than Indonesia and the desirability of making the project a regional one. The Philippines and Sri Lanka were suggested as additional countries for focus.

HACCP/ISO 9000

The nature and value of both HACCP and ISO 9000 was discussed, including the growing importance of ISO 9000 as a quality certification tool for food processing in SE Asian countries (both Thailand and Indonesia have programs in this area and the Philippines and Malaysia have also indicated an interest). It may be important to incorporate ISO 9000 into some RAP program activities. The value of HACCP in the seafood industry, particularly with the new FDA initiatives in this area, were noted in discussion.

The need to educate USAID Bureau and Mission staff more fully on both HACCP and ISO 9000 was noted. USAID suggested the development of a project paper on the two areas, incorporating both a background on the two subjects as well as an assessment of their importance to RAP countries. The paper might be done in two phases: an initial background/current assessment of use and interest in RAP/SE Asian countries, and a follow-up paper speaking to the actual RAP country policies on HACCP and ISO 9000 based on the finding of the needs analysis/inventory project.

Sri Lanka Pesticide Residue Laboratory Evaluation Project

Discussion on this topic focused on the necessity of rapidly implementing this project and the difficulty in obtaining assistance on this from EPA and FDA. Substantial project contact with EPA, and to a lesser extent with FDA, had been made in this regard. Noted was the ability of TAS (RAP/EC subcontractor) to carry out this project, and that a proposal could be prepared within a few days. Also noted was the possibility of linking the evaluation to the needs analysis/inventory visits to be undertaken by Bowman and Wehr (see below) to reduce costs.

It was felt that it would be worthwhile to canvass other USAID countries (like Nepal) to see if similar laboratory evaluation needs existed and to consider expanding the project to cover these other countries.

It was decided to ask TAS to prepare a proposal to conduct the laboratory evaluation based on the scope of work provided for Sri Lanka. Simultaneously, EPA and FDA will be contacted by USAID/USDA to evaluate their interest in carrying out this short-term assignment.

Needs Analysis and Inventory Project

Bowman and Wehr indicated that initial discussions had taken place to outline the work activities to be undertaken with the RAP/EC needs analysis and inventory. A brief review of what the project entailed was presented. This included determination of the causes of failure of RAP country exported product to target import countries, and the identification of requirements for remediation of the problems as indicated by both government officials and importers in importing countries, exporters, processors, university extension specialists, and exporters of RAP countries. This would be done by direct visits by Bowman/Wehr of appropriate RAP and target export country individuals and through an examination of appropriate import records.

Indonesia Cocoa IPM Project

Bowman reported on several fruitful meetings between RAP and the American Cocoa Research Institute (ACRI) to launch an integrated pest management project for Indonesian cocoa. ACRI has indicated an interest in sourcing more cocoa out of Indonesia and, at the same time, they have been searching for an opportunity to launch an IPM initiative in Asia. They have already sponsored initiatives in Latin America and Africa. Further meetings will outline a potential project that will be presented to USAID/Indonesia in the near future.

MEETINGS WITH OTHER AGENCIES/ORGANIZATIONS

FDA Import-related Personnel

Discussion focused on the availability of resource information on automatic detentions and import alerts and on the capabilities of the food industry within the RAP countries. Also covered was the ability of FDA to assist with the identification of RAP country food industry and food export representatives.

FDA noted that NTIS (National Trade Information Service) publishes the import alerts and automatic detentions for FDA. It is available for purchase from NTIS.¹⁵ It was also observed that the product import volume is available through the Department of Commerce, and that detail beyond the NTIS publication is available within FDA but must be manually retrieved. This is difficult to do without funding assistance because of resource constraints.

For the remedial needs of countries, FDA indicated that the problems are multiple and broad-based across many product lines and across countries. Problem areas include basic sanitation, lack of knowledge on processing, microbiological contamination, the presence of filth and foreign material, and the presence of illegal additives. Pesticide residue violations are few in number relative to those involving filth, however; pesticides are still a major concern of FDA inspectors. FDA indicated all RAP countries exhibit significant levels of all food safety violations. However, they recognize that certain Asian food exporters operate correctly on a consistent basis (these are often multinational operations).

FDA suggested that RAP efforts focus on some fairly elementary areas — specifically, basic plant sanitation and good manufacturing practices. It would also be helpful to assist countries in explaining how FDA operates and what they must do to meet FDA import requirements. FDA indicated that a very basic HACCP approach be taken in such areas as plant sanitation, insurance of proper process times, worker hygiene, and the like. Basic HACCP training, along with information on how FDA operates, should go a long way to solving many of the current problems. FDA also suggested that a clear focus on a limited segment of the food processing industry would likely be more valuable than a broad brush approach; concentration should be on those industries that have a positive approach to resolving their own problems.

The process might involve concentrating RAP efforts on the following:

In cooperation with FDA, developing and presenting an informational course relating to FDA import requirements focused on fruits/vegetables and seafood. The course could cover what the FDA expects of processors and exporters of these commodities to the United States and recommendations on how to achieve them.

Basic GMP training in seafood and fresh fruit and vegetable processing, developing an Asia HACCP course that speaks to the basic needs of the industry.

One to three targeted, in-depth industry remedial projects based on the interest of the industry and the export volume to the United States.

Meeting with FDA Office of Seafood

The main purpose of the meeting was to outline a strategy for collaboration between RAP and the Office of Seafood in HACCP. The key summary points were as follows:

The Office of Seafood is providing an information cable on the HACCP program proposal to all USAID Missions.

¹⁵ TAS already purchases this publication; it is available in hard copy only.

In response to inquiry on the status of the technical capabilities of the SE Asian seafood industry, FDA responded that, although there are some good establishments, in general and overall, you cannot expect a great deal of sophistication from these countries. The problems with all countries include microbial pathogens, filth, foreign material, heavy metals, and pesticide and drug residues. All areas are a problem in all countries.

The key concepts from this discussion were two:

The need for basic education of the workforce in personal hygiene and sanitation work habits, tied into the workplace and the relationship to product safety and quality. Recommended by FDA was a very basic training program in simple language by both booklet and video format that would educate the line workers in this basic but essential area. It was also noted in discussion that such a training program may have impact away from the workplace, specifically in the home, and that secondary benefits may occur from this type of training effort. The additional benefit may, from a USAID perspective, provide more incentive to implement such a program. Additionally, there is no doubt that such a program, customized to other processing sectors such as the fruit and vegetable industry, would have the same benefit in that area.

The need for training in HACCP concepts but applied to a basic level; that is, training in the foundation areas of pesticide/drug usage controls, general sanitation principles, process controls, post-processing product handling, and so forth, using the HACCP concept. This would not necessarily be a commodity-orientated HACCP training program (although it could include some customization in this regard), but rather a training program on the essential fundamentals of good manufacturing practices worked through the HACCP concept and philosophy.¹⁶

- FDA commented on the need for a workshop in the Asian area (as well as Latin America) for seafood processors and exporters on how the FDA Office of Seafood plans to regulate the importation of seafood. This would be a workshop that would review in detail the requirements of the FDA Seafood HACCP proposal including the presentation of model HACCP plans for specific hazards and seafood species. The workshop would also detail the importing procedures and requirements for seafood that will continue to remain in place. FDA Office of Seafood personnel would be the presenters for the workshop. FDA indicated its desire to have the workshop(s) held in 1994/1995.¹⁷
- Regarding Seafood HACCP training, FDA does not see themselves as trainers, although they do some training upon invitation. FDA staff indicated that they do not see themselves dealing directly with industry in the specific product HACCP training area but rather as providing the scientific and technical assistance needed to make sure that training done by other groups (such as sea grant universities, National Marine Fisheries Service [NMFS], and private organizations) is done correctly from the perspective of the FDA seafood program. It was noted that FDA's

¹⁶ It should be noted that the same concept/comment was made during a previous meeting with FDA CFSAN/Import Office personnel (see previous meeting notes). It was noted that some model programs do exist in this area. A possible contact in this regard is Info-Fish, a regional seafood entity based in Kuala Lumpur.

¹⁷ This need for providing basic information to foreign processors and exporters on how U.S. regulatory systems operate is the same message RAP has received from both FDA CFSAN and the FDA import policy office, and from USDA APHIS; it is an area RAP needs to pay attention to and is clearly a training area need that can be fulfilled through RAP.

association with the National Marine Fisheries Service was viewed no differently than their association with any other training organization such as the National Food Processors Association or the Food Marketing Institute. The seafood alliance was discussed. The alliance is a consortium of university sea grant, NMFS, and other NGO groups put together to provide training to the seafood industry on HACCP. FDA is a part of this group as a technical advisor but not as a trainer.

- The important role that RAP could provide in communicating the technical and program information to the Asian region through the RAP newsletter was noted. The possibility of devoting an issue of the newsletter to the FDA seafood HACCP program was discussed.
- The area of international memoranda of understanding and equivalency agreements was discussed. FDA has no mandate per se for the establishment of memoranda of understanding with foreign governments. Historically, there have been several types of MOUs — dealing with information sharing as well as product certification. Product certification MOUs have usually occurred as a result of specific problems (such as staphylococcus microbiological problems with imported mushrooms) and have been negotiated with individual governments for individual commodity areas. FDA is trying to move away from these commodity-by-commodity agreements and toward the recognition of a systems approach to assuring product safety. These agreements will be termed equivalency agreements and will be a subset of the MOUs established by FDA.
- Those attending from FDA expressed an interest in obtaining information on the results of RAP/EC visitations to RAP countries including information on key seafood industry contact individuals.
- Summary of results from this meeting:

The role of RAP in assisting in the dissemination of seafood HACCP training to the Asian region is viewed as important by FDA.

Information on the FDA Seafood Program is important and is the basis for a standalone workshop that appears to have high priority for FDA. Eventually, detailed HACCP training will also be important once the FDA seafood HACCP program is finalized.

Meeting with National Marine Fisheries Service¹⁸

The core business of NMFS is a voluntary fee-for-service seafood inspection service; primary services within this area include establishment of sanitation inspection, process and product inspection and product grading, and a HACCP-based inspection service. All firms that voluntarily submit to NMFS inspection services must then comply with all rules and regulations pertaining to that aspect of the services for which they contract; successful compliance under specific inspection services results in the ability to be placed on certain NMFS approved lists or to use official grade marks.

¹⁸ NMFS is a part of the National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

The NMFS Establishment Sanitation Inspection program involves adhering to good manufacturing practices including the use of approved and established sanitation control programs. Firms in compliance with this program are listed on the USDOC (U.S. Department of Commerce) Approved List.

The NMFS Process and Product Inspection and Product Grading Program involves inspection and certification that the product was produced under NMFS-specified conditions of sanitation and quality. The NMFS certification signifies that the product is safe, wholesome, properly labeled, and of acceptable quality. Inspection can also certify as to specific U.S. grade standards or other U.S. standards relating to specific government programs. Inspection of this type can be continuous under contract or on lot-by-lot inspection. Under this program products destined for export can be inspected and certified and an official USDOC certificate may be issued that becomes a part of the letter of credit or other shipping documentation.

The NMFS HACCP program requires the processor to submit a HACCP plan for approval by NMFS. NMFS will then monitor the program and certify that the product is produced under an approved HACCP plan. Product produced under a HACCP plan will qualify for one or more NMFS marks. NMFS also maintains an Integrated Quality Assurance (IQA) service that requires production under an NMFS-approved quality assurance plan. The program incorporates HACCP but extends beyond to incorporate greater end-product testing.

Additional NMFS program include laboratory testing services, training services, and consultation services. All are carried out on a fee-for-service basis.

Information was provided on the above services (including a program summary sheet and a copy of the NMFS inspection and certification regulations - 50 CFR, Chapter II, Subchapter G) and a copy of the current NMFS fee schedule.

The balance of the meeting focused on seafood HACCP and the international activities of NMFS. NMFS routinely carries out HACCP-related training internationally. Under the Agricultural Marketing Act, NMFS has authority to deal with the seafood industry both domestically and internationally.

Although NMFS does not currently approve foreign product for import into the United States, they are looking at this field, especially in relation to the FDA Seafood HACCP Proposal. NMFS is discussing this area with FDA and are reviewing their regulations and programs in relationship to developing an import approval and certification program for foreign processors.

The NMFS inspection and certification programs include the areas of safety, quality, and economic adulteration (see above). NMFS has provided HACCP training to 1,000 individuals within the seafood industry. He noted that the core training staff of NMFS is 10 individuals but NMFS can call upon a cadre of some 150 product inspectors expert in various seafood processing areas to assist as necessary.

NMFS is working with the U.S. Seafood Alliance in training the U.S. seafood industry in HACCP. The Alliance is composed primarily of seafood extension specialists (U.S. Sea Grant Universities) and industry representatives. The Alliance training program may become the training model for use under the FDA Seafood HACCP program. NMFS has done HACCP training for foreign governments and industries. He specifically noted the work NMFS has done with India and Indonesia. NMFS has provided HACCP training to Amalgam, an Indian shrimp processing organization, and to MPEDA (Marine Products Export Development Authority), an Indian quasi-government organization. Within Indonesia, NMFS has worked within the government; work was done through Josephine Wiryanti,

Directorate General for Fisheries (this organization is separate from the Ministry of Agriculture and the new Indonesia FDA that is being developed). All aspects of NMFS Indonesia project, including training of Indonesian personnel in the United States (see below) was funded through USAID/Indonesia Agribusiness Project (ADP). The Indonesia program initially involved the training of a core group of 25 individuals in each of several regions; four individuals from each region (apparently all government) were then picked for further training in the United States.

Indonesia is developing a Fish Inspection and Quality Control Program that combines the attributes of the NMFS program and a similar program operated by the Canadian Government (Fisheries Canada). Indonesia is taking the NMFS program for shrimp and the Canadian Fisheries program for tuna.

NMFS would/could work easily within RAP/EC, providing HACCP training or other services within the scope of NMFS program activities. Training can be tailored to need covering such areas as industry assessment, site assessment, and HACCP training. All training is normally done from a straight NMFS perspective and program approach although they are willing to comment on the program needs of other countries (like Japan or the EU) to the limit of their knowledge and with clear indication of the same. Wilson noted that they have no problem in sharing the program with representatives of other countries and have done so in the past. All work done for RAP would be on a fee-for-service basis, based on applicable NMFS fee schedules. NMFS requires a five-week lead time to conduct training courses.

NMFS would rather work on an individual country or country-industry or company basis as opposed to approaching training from a regional basis. They felt that a regional approach becomes too complicated and results in courses that were not specific enough to be of true benefit. NMFS also noted that a HACCP-orientated course should focus on more than just the basics (contrary to FDA opinion — see previous meeting report with FDA), and that it is beneficial "to give them more they can chew" — do NOT limit the course to just elementary areas. NMFS finds that many of the developing countries have very capable people in the general seafood area although very mixed capability in the seafood processing area specifically.

The next steps recommended as a result of this meeting:

Acquire the final evaluation of NMFS-conducted Indonesian activities funded through the ADP project.

Communicate the findings of the NMFS Indonesian effort to other regional USAID projects.

Meet with the FDA Office of Seafood on HACCP activities as related to the Asian area and the relationships between NMFS and FDA in this regard.

Incorporate the findings of these visits into the needs assessment visits to be undertaken by Bowman and Wehr in the RAP countries. Determine how both NMFS and FDA Office of Seafood can assist in seafood export enhancement of RAP countries based on the priorities identified by RAP country government and industry representatives.

Meeting with the Agricultural Section of the Embassy of the Philippines

This meeting was conducted with representatives of the Philippine Embassy because the Philippines is the current "Chair Country" of the Washington ASEAN Committee (WAC). WAC is a working group of embassy representatives of the ASEAN countries located in Washington, D.C.

The purpose of the meeting was two-fold:

To acquaint the Philippine representatives with the USAID SE Asian Regional Agribusiness Project.

To learn more about the ASEAN Union, especially in the agricultural area.

Although the focus of the meeting was on these two areas, there was also significant discussion of the specific USAID-related activities in the Philippines, specifically the ASAP project.

The meeting opened with a review of the new Medium Term Philippine Agricultural Policy. This policy covers the period 1993-1998. The goal of the policy is to reduce the planted acreage of corn and rice, maintain current yields of corn and rice by intensified cropping practices including significant IPM use, and convert the freed acreage for use in the production of new crops. The basic enhancement crops have been identified but they were not specified at this meeting. There was significant interest and activity noted in increased livestock production; this is a clear priority focus of the Medium Term Agricultural Policy.

Noted was the existence of a Memorandum of Understanding with the U.S. FDA on bilateral recognition of portions of the Philippine food industry in the food safety area. A general agreement plus subagreements relating to specific industry areas exist. Apparently, there has been little direct activity between FDA and the Embassy on this agreement for some period of time.

Next, comments focused on the ASEAN Union. It was noted that the Philippines was "Chair Country" of the WAC though April of this year with Thailand assuming the Chairmanship for the upcoming year. It was inferred that the ASEAN Union focus was primarily economic and political policy issues. However, it was noted that there was, at one time, an ASEAN Committee on Food, Agriculture, and Forestry. The Committee had a focus on export enhancement, and had a work plan drafted in 1991; the Committee has since been dissolved. However, there is still some ASEAN activity associated with agriculture, primarily through the Jakarta office.

An ASEAN Committee on Technology Exchange exists; this is an effort to involve exchange of government and business leaders to develop business opportunities. The work of this committee is linked to the U.S. Asian Environmental Partnership (AEP) program and the Trade Opportunities Program. Also noted was a new initiative launched by the U.S. Government at the Seattle APEC Conference related to technology transfer; there is apparently a Technology Inventory Coordinating Committee or TICC and an organization called the Alliance for Mutual Growth. These entities are apparently involved in technology enhancement in the developing countries utilizing existing funding sources such as the Asian Development Bank.

The sense of the ASEAN Union was that although their primary activities are broad political and economic issues, the ASEAN Union could be a valuable source for locating and obtaining funding for specific priority project needs. Additional points brought up in the discussion included the following:

Noted was the interest of the Philippines in getting USDA FSIS recognition of the Philippine meat inspection system. This is an area that The Philippines has previously brought to the attention of FSIS without marked success. It was noted that San Miguel Foods especially has an interest in this area. The mention of this area in this meeting likely means that it has some priority for the Embassy officials.

Also noted was the interest of the Philippines in establishing a Food Standards Training Institute. This would be an actual physical facility for training governmental and industry personnel in food safety and related areas such as HACCP, Good Manufacturing Practices, and the Better Process Control School. This would be a facility that would be regional in scope.

The Philippine Embassy representatives indicated they would be willing to assist in the identification of key Philippine government, trade association, and exporter personnel for visits by RAP/EC. They commented that they believe the current USAID Philippine ASAP project personnel were quite knowledgeable about the needs in the environmental area. It was noted, however, that additional inquiry as to environmental needs would be beneficial and that the ASAP project may not extend to cover all the needs in that area.

In summary, this was a helpful meeting to:

Become acquainted with significant parties for future contact and assistance.

Begin a dialogue with the ASEAN Union through the WAC. Subsequent discussion with this group should be undertaken. RAP personnel should attend the ASEAN Dialogue meeting and meet with ASEAN agricultural representatives in Jakarta.

Obtain the assistance of the Embassy in making contact with Philippine government and industry representatives for the RAP/EC fact-finding trip.

SUMMARY: PRIORITY AREAS FOR RAP INTERVENTION

The following is a summary of the key areas of need and potential work for the environmental component of RAP.

IMPORTING COUNTRIES

Hong Kong

No significant opportunities identified for RAP at the present time.

Japan

1. Assistance with control of oriental and melon fruit fly in exported fruit products.
2. Assistance in antibiotic drug residue minimization in the aquaculture sector.
3. Assistance in product quality improvement and pesticide minimization programs.
4. Cooperation with JICA on the Sri Lanka Quarantine Project and the Philippine BPI pesticides laboratory project.
5. Provision of translated Japanese food safety and phytosanitary entry requirements to exporters in the RAP countries.

Singapore

1. FDA Seafood HACCP workshop.
2. Development of a pilot program between Singapore and several large horticultural exporters (Indonesia) to certify that pesticides are being used judiciously and to minimize residue problems.
3. Comparison of seafood HACCP requirements between the United States, European Union, and Japan.

South Korea

No significant opportunities for RAP identified at this time.

United States

1. Increased assistance in basic "quality management" of fresh and especially processed seafood and produce. Emphasis should not be on overly sophisticated HACCP protocols, but on basic plant

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sanitation, worker hygiene, and good manufacturing practices. Technical assistance to solve problems of filth and foreign material deemed more important than pesticides or microbial pathogens.

2. Specific training in seafood HACCP for low-medium quality seafood exporters.
3. Facilitate exporter access to FDA, EPA, and USDA databases.
4. Specific assistance to Indonesia to improve its automatic detain situation for cocoa and shrimp exports to the United States.

EXPORTING COUNTRIES

Bangladesh

1. Assistance with the development of food safety regulations implemented through the Ministry of the Environment.
2. Providing information on sources for used equipment in food processing, waste effluent, and laboratories.
3. Assistance with chemical (including pesticides) and microbiological laboratory enhancement, including analyst training. This can probably best be accomplished by a preliminary (feasibility) study to identify precise needs and resource requirements. The study should incorporate a review of the establishment of a central facility associated with agricultural export.
4. Providing assistance for seafood HACCP to the fisheries export industry.
5. Providing consultant assistance in multiple areas including fruit and vegetable processing, waste effluent treatment, and composting.
6. Assistance with proper pesticides application with a focus on basic applicator training and pesticide use.

India

1. Feasibility study for a Pride of India food enhancement program. For several key commodities, this program would integrate a number of key technical assistance needs including:
 - Linkage of agribusiness projects with sustainable, environmentally sound production practices.
 - Export product enhancement through a recognized “seal of export quality”.
 - Pesticides minimization and integrated pest management.
 - Laboratory upgrading and analyst training.

- Provision of food technical information in the form of quality/grade manuals, food standards information, and so forth.
 - Improved product safety and quality.
2. Postharvest product quality and grade manuals, with some assistance in organic food certification.
 3. Technology update workshop. This would provide update information in food processing and could extend also to food safety and product hygiene.
 4. Technical information services to access foreign food regulations, and where appropriate and obtainable, food additive and pesticide safety assessment information.
 5. Providing access to relevant EPA databases to appropriate Indian agencies and organizations.
 6. Providing access to one or more viticultural and postharvest technical experts to the Indian grape industry to carry out a comprehensive technical review of the industry.
 7. Providing technical training services in food inspection (regulatory and/or voluntary quality programs), good manufacturing practices, and HACCP.
 8. Food laboratory (including pesticide residue) upgrading and analyst training, if the Pride of India program does not move forward.

Indonesia

1. Assistance with development of an integrated pest management program for the cocoa pod borer.
2. Assistance with resolution of the automatic detention of cocoa and shrimp exported from Indonesia to the United States.
3. Assistance to the cocoa industry in improved fermentation/ flavor processes.
4. Holding one session of the FDA Seafood HACCP Workshop in Indonesia.

Nepal

1. Technical assistance to the private dairy sector in new product development and product safety.
2. Assistance to remote villages in producing higher value, nutrient-rich fruit and vegetable crops — both for local consumption and for income-generating purposes.
3. Environmental cleanup of carpet and tanning industries.

The Philippines

1. Analysis of the Philippines compared with developed countries in sanitary and phytosanitary standards to show where deficiencies are with regard to entry into GATT.
2. Assistance with the development of an extraneous materials testing laboratory, specifically providing a listing of needed testing equipment and providing analyst training.
3. Providing assistance with basic food processing GMP and quality control programs.
4. Development of model plans and specifications for small to medium-sized food processing establishments focused on key commodity areas.
5. Assistance to select agribusinesses and NGOs in sustainable agricultural practices, including IPM and organic farming techniques.

Sri Lanka

1. Assistance to develop and train a food/agriculture analytical laboratory that can provide services to:
 - Domestic food processors and the agriculture industry.
 - Government agriculture and research agencies.
 - Medical agencies involved in poison control work including pesticide poisonings.

Consideration should be given to designing this facility so that it could also serve as an export testing and consultation laboratory.

2. Extend additional assistance to microenterprise food processing projects and firms by the development of a basic training handbook in food processing for microenterprises and by providing one-on-one technical assistance and training seminars on food plant sanitation, good manufacturing practices, and wastestream management.
3. Assistance with the development of a national food inspection and food standards system. Consider an initial focus to develop food standards for key Sri Lankan commodities and processed food products followed by a program to implement basic inspection and hygiene standards within the processing industry. Also to be considered are basic training programs in retail and food service food hygiene.

RAP WORK PLAN PRIORITIES

Based on the results of the fact-finding missions that form the basis of this report and of several follow-up contacts between RAP and the USAID field Missions and agribusiness projects, the following is a list of the key RAP activities that have emerged since the field interviews were conducted. These are the activities that, as of this writing (June 1995), are the higher priority work plan items designed to

alleviate some of the environmental constraints to Asian agribusiness trade identified by the RAP environment team. Some of these projects have been completed or initiated. Others are awaiting supplementary funding from the field Missions.

Analytical study on import detentions of RAP-country products in foreign markets
Paper on the relationship between agribusiness and environmental risk
Paper on case-studies of integrated pest management and the private sector
Paper on the pesticide policies and programs of different Asian countries
Regional workshop(s) in seafood HACCP
Regional workshop on the U.S. seafood market
Regional workshop(s) in food plant sanitation
Regional workshop on postharvest technologies
Regional workshop on phytosanitary barriers to trade
Regional food laboratory strengthening project
Technical assistance in dairy processing (Nepal)
Technical assistance in local horticultural production and marketing (Nepal)
Technical assistance in cocoa import detentions by FDA (Indonesia)
Technical assistance on IPM control of the cocoa pod borer (Indonesia, Philippines)
Technical assistance in filth, extraneous materials testing (Philippines)
Technical assistance in basic GMPs and HACCP (multicountry, possibly with videos)
Technical assistance in pesticide maximum allowable residue limits (multicountry)
Grape/seafood export enhancement program with "seal of quality" certification (India)

CONCLUSIONS

RAP environmental team visits to both the importing and exporting countries revealed a wide range of needs to be addressed in the areas linking environment, food quality, and food safety to agribusiness. For agribusiness operations to be sustainable, they have to be cognizant of and responsive to environmental concerns. Although many processors and exporters will attempt to get by with minimum compliance with local regulations, those who will excel over the long term will strive to be ahead of local and international standards. They will attempt to overcomply with environmental and food safety standards to maximize public relations and consumer confidence such that brand loyalty is established early on and maintained.

This is where RAP can help the most. RAP's limited resources will not be able to affect the large number of agribusiness concerns that wish to simply conduct business as usual with an absolute minimum of environmental compliance. Our interventions will be of greater assistance to those who truly have a long-term vision and are genuinely concerned about the safety of their products and the way in which their production processes affect the nonrenewable resources of the environment.

In which areas should RAP work to overcome some of the environmental constraints to Asian agribusiness trade?

PRODUCT QUALITY

This is the number one area for technical assistance from the environment component. Key interventions should be in postharvest handling. Assistance in crucial components of the farm-to-port chain need to be addressed for fresh produce, such as cooling, bruising, sorting, washing, packaging, labelling, temporary storage, transport, and prevention of contamination from chemicals or extraneous materials. All these efforts, most of which will reduce spoilage and decomposition, are to be aimed at improving product appearance and quality at the final market destination.

RAP can also make some significant contributions in product quality through technical assistance in process control and management. Interventions in simple, good manufacturing practices, low acid canning techniques, general food plant sanitation, worker hygiene, and HACCP (where appropriate) are warranted. These interventions will serve to improve the poor quality image suffered by RAP country product due primarily to concerns over contamination with filth and extraneous material.

RAP can also make contributions in providing information on minimum quality standards and consumer quality expectations in target markets. Provision of information on grades and standards is part of this, but further extension into areas such as size, shape, color, flavor, texture, varietal type, and packaging preferences are also warranted.

PRODUCT SAFETY

Although the environmental team saw numerous opportunities for RAP to offer assistance in food safety, the importing countries (with the possible exception of the United States) considered this to be far less of an impediment to trade than food quality. Many importers are concerned about product

decomposition, spoilage, contamination with toxic microbes and chemicals, and similar factors, but food safety concerns do not really seem to be a driving force behind the international movement of agribusiness products out of Asia or between Asian countries. Process controls designed to improve overall product quality (such as good manufacturing practices, HACCP) will indirectly serve to improve food safety in any case. The one possible exception to this low-key perspective on food safety would be the seafood industry, where food safety is actually a priority concern and where much technical assistance to prevent product contamination with toxic microbes and drug residues is being rendered.

Another food safety-related concern has been that of pesticide residues. Despite the substantial concerns of importers, exporters, and international donor agencies about this issue, in fact, actual detentions of food product in foreign ports because of residues are relatively few. Concern runs high, however, because traders are well aware that the consuming public can easily overreact to the slightest misconception or ill-founded association between food and pesticide content. The possibilities for RAP to make contributions in this area are described in the next section.

TRADITIONAL ENVIRONMENTAL ISSUES

Pesticide Residues

The fate of agrochemical residues in the environment is a priority area for RAP intervention, particularly where residues on consumable agribusiness products are concerned. RAP can help minimize such problems through technical assistance in the following areas: safe, judicious use; the use of least toxic alternative compounds; biological and cultural control of pests; and provision of information on maximum allowable levels of residues in foreign markets.

Integrated Pest Management

Currently popular is the use of integrated techniques to minimize the use of synthetic agrochemicals and thereby lower production costs and increase product safety. Complete IPM systems are complex to implement and will require substantial buy-ins into RAP to achieve any meaningful degree of impact. However, RAP can more easily provide informational support — updating interested agribusinesses with the latest technical innovations in IPM, relating success stories in horticultural IPM from other parts of Asia or the world, and other such support. RAP has identified “private sector-sponsored IPM” as an area of importance that as yet has not reached many interested Asian agribusinesses. Most IPM programs have been promoted by state and federal agencies in staple food crops such as grains. RAP can make an important contribution by relating success stories in private sector-sponsored IPM — medium to large companies actually making internal investments in innovative, environmentally friendly techniques to control pests.

Organic Farming

RAP also has found that another area of traditional environmental interest is organic farming. Many agribusinesses (or the associations that support them) were highly interested in being able to supply organically certified product, especially to export markets. Their interest was considerably high even though their market research efforts for the organic products had been very limited. RAP can provide

assistance to Asian agribusinesses in how to grow produce organically, how to implement a successful and legitimate certification process, and how to conduct market research for organic products.

Agroprocessing Wastestreams

Visits in the RAP countries revealed a significant number of opportunities for RAP to provide assistance in the management of wastestreams from agroprocessing facilities. Both clean-up of liquid effluents and treatment and use of solid wastes are areas of interest. However, the nature of the requests for such assistance are not uniform, even within individual countries. Therefore, most of the assistance would have to be fairly customized on a plant-by-plant basis to be effective. One potential area for common interest may be that of composting, and perhaps a regional seminar on this topic could be worthwhile. RAP might also provide generic information on low technology solutions to end-of-pipe effluent problems focused on certain industry sectors, such as fruit processing, poultry, dairy, and leather tanning.

CROSS-CUTTING RAP INTERVENTIONS

Export Enhancement Programs

RAP has the ability to design and help implement major sectoral export enhancement programs using principles of "total quality management" and "seal of quality" certification programs that would be recognized in foreign markets. The Pride of India export enhancement program (described elsewhere in this paper) would be an example of this. RAP should initially focus on feasibility studies, overall project design, and provision of technical expertise to identify quality constraints. Thereafter, local funding sources from both the public and private sector would have to contribute in a major way to the actual rollout of the program. A partnership of key stakeholders has to be willing to share in the cost of the program, and, in particular, the producers have to be willing to pay for laboratory testing of product, acquisition of the quality seal or logo (if merited), and for the provision of outside technical expertise to identify quality gaps.

Upgrading of Analytical Food Laboratories

We identified many opportunities for RAP involvement in this area which has cross-cutting implications for food quality, safety, and issues of general environmental concern. Food laboratory infrastructure in all the RAP countries was relatively weak, especially in the crucial area of pesticide residue analysis. Accurate detection of filth and extraneous material is another area worthy of assistance. RAP can serve to assess the status of laboratories, initiate remedial work, integrate qualified laboratories into export enhancement programs, improve importer confidence in the capabilities of local laboratories, and identify new, regional market opportunities for credible, upgraded laboratories.

Technology Awareness

Asian agribusinesses seem particularly willing to be exposed to the latest technological innovations that might improve product quality and cost-effectiveness both for domestic and foreign markets. RAP can provide a steady stream of information on relevant technologies, pursue customized requests, or even

sponsor regional workshops on appropriate topics. Technological transfer between USAID-supported Asian agribusiness projects is minimal — many projects are not even aware of technology breakthroughs being sponsored by USAID in similar projects in neighboring countries. RAP can serve to stimulate that all-important cross-fertilization, as well as introduce technology innovations from other parts of the world.

RELATIONSHIP TO USAID STRATEGIES

RAP is managed by USAID's Office of Agriculture and Food Security (AFS), which is a component of the Economic Growth Center of the Global Bureau. RAP, and the major environmental interventions outlined above, will assist AFS in generating sustainable agricultural growth that will expand income and food purchasing power throughout developing countries in Asia. The overriding concern is to improve food security in these countries. RAP environmental interventions will contribute to this through promoting greater efficiency and productivity in the use of agricultural and agribusiness resources while maintaining the integrity of the environment. AFS desires improved technologies in food production, processing, and marketing so that food costs to poor consumers are eventually lowered. RAP assistance in such areas as food quality, safety, and laboratory enhancement will serve to make contributions both in environmental health and economic growth. Postharvest losses will be reduced. Access to more sophisticated consumers will generate added disposable income for the producers. Their operations will prosper, become more efficient, and ultimately per unit cost to the consumer will be lowered.

Although some of the USAID agribusiness projects supported by RAP have an export focus, the quality and safety interventions needed for success in export environments will also have a very positive effect on quality and safety of agribusiness products for the domestic market. This is especially true in laboratory enhancement — if these facilities can be upgraded to the point where their procedures become reliable and credible, both domestic and export-oriented food producers will increase demand for their services so that they may confidently assess and track the quality and safety of their product.

Environmental interventions such as organic farming and integrated pest management, if successful, have further potential to lower production costs through minimizing the need for expensive, synthetic agrochemicals. IPM and other interventions to keep pesticide residues on food under control, as well as the clean-up of agroprocessing wastestreams, all make contributions in environmental health. In the six RAP-supported countries, it will be exceedingly important to keep the agricultural production base as "clean and green" as possible. The use of toxic agrochemicals must be minimized. Contamination of the nonrenewable resources (especially water and soil) within the production base, or contamination of the laborers who keep the production base active, will eventually stagnate or greatly reduce the output of the base. This would lead to limited production capacity and much higher food prices in the future for the poor.

AFS strategic objective #1 is stated as follows: "**Help to ensure that adequate quantities/qualities of food become available to target populations.**" RAP's environmental program will make several important contributions here. First of all, this very paper is a documentation of constraints to productivity and profitability in the agriculture and agribusiness sectors. And solutions to overcome these constraints are offered — some of which are already being implemented. Second, the RAP environment component offers many opportunities to enhance in-country human and institutional ability to increase agricultural productivity, although the focus is clearly not so much on public sector institutions but on private sector ones.

Strategic objective #2 is stated as follows: **"Assist poorer households, and all individuals within them, to have adequate access (through self production and/or purchasing power) to food."** The principal RAP contribution here would be in lowered food prices through more efficient postharvest and marketing operations that serve to decrease postharvest loss and enable the farmer to acquire maximum return on the dollar for the produce. RAP ability to identify, and to assist with the entry and quality requirements of those markets willing to pay the best price for the produce, is a case in point.

And finally, strategic objective #3 states that AFS should **"Promote agricultural practice that enhances the long-term conservation of natural resources."** RAP-sponsored interventions in pesticide safe-use, integrated pest management, organic farming, and effluent treatment for agroprocessing facilities can make significant contributions to this objective. All these activities tend to conserve natural resources through minimizing exposure of the resources to degrading and potentially toxic agrochemicals and wastes.

The RAP environment component will strive to make USAID-supported agribusiness initiatives in Asia into significant contributors to economic growth, primarily through making the postharvest process more efficient and quality driven; facilitating access to markets by making food safety, food quality, and phytosanitary requirements more transparent; and making the entire agribusiness process more sustainable through protection of the natural resources, workers, and consumers from environmental hazards. RAP cannot force environmental and quality compliance upon the Asian agribusiness community. We have to adequately promote the economic and other advantages of environmental sustainability and then work with those firms and entities that truly share that vision.

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ANNEX A
QUESTIONS USED BY RAP TEAM

The following set of questions were used by the RAP environment team as the basis for conducting interviews with agribusiness entities in both the RAP countries and export countries. More often than not, the interview process was not able to adhere rigidly to this exact set of questions. The interviewers did their best to learn as much as possible about environmental factors that serve to constrain export-oriented agribusiness trade, and to find out from the interviewees what might be some of the more meaningful ways for RAP resources to be applied to these problems.

FOR COUNTRIES IMPORTING RAP FOOD/AGRICULTURE PRODUCTS (JAPAN, KOREA, HONG KONG, SINGAPORE).

A. For government food and agriculture organizations.

1. Sanitary/phytosanitary reasons for product failures upon arrival.
2. Statistics on import sanitary/phytosanitary detentions and rejections; by commodity by product by failure reason.
3. Areas in which the agency currently is participating in or directing/funding food/agriculture related training and or assistance programs in RAP countries.
4. Priority areas in which RAP countries must focus to increase import product acceptability.

B. For importers and import associations.

1. Sanitary/phytosanitary reasons for product failure upon arrival.
2. Quality deficiencies identified as reasons for product failure upon arrival.
3. Priority areas in which RAP countries must focus to increase import product acceptability.
4. Policies of RAP country governments/organizations which limit the importability of food products.
5. Policies of the import country towards RAP countries which limit importing of food and agricultural commodities.

FOR RAP COUNTRIES EXPORTING FOOD AND AGRICULTURAL COMMODITIES (BANGLADESH, INDIA, INDONESIA, NEPAL, PHILIPPINES, SRI LANKA).

A. For government food, agricultural, and environmental organizations and related NGOs.

1. Priority areas of need for food safety enhancement.
2. Priority areas of need for food quality enhancement.
3. Other priority areas of need related to the sanitary and phytosanitary field.
4. Policies on IPM, HACCP, ISO 9000.
5. Priority needs in the environmental field including occupational worker exposure and health, surface and groundwater quality, and wastewater treatment.
6. Information on current assistance programs in place (type of project, how funded, interrelationships between govt. and private organizations.)
7. Level of cooperation with other RAP countries.
8. Identification of technical trade policy issue areas with major target export countries.

B. For Industry, Trade Associations.

1. Priority needs for food safety enhancement.
2. Priority needs for food quality enhancement.
3. Level of commitment to IPM, HACCP, ISO 9000.
4. Priority needs in the environmental areas of occupational worker exposure and health, surface and ground water quality, wastewater treatment.
5. Working relationships with country government, academic organizations.
6. Identification of technical trade policy issue areas with major target export countries.

ANNEX B

**ORGANIZATIONS VISITED IN ASIAN EXPORT MARKET COUNTRIES,
IN THE COUNTRIES SUPPORTED BY RAP,
AND IN THE UNITED STATES**

JAPAN

1. Japanese Ministry of Health and Welfare (MHW), Office of Port Health Administration, Food Sanitation Division, Environmental Health Bureau.
2. Japanese Ministry of Health and Welfare, Tokyo Quarantine Station.
3. Japanese Ministry of Health and Welfare, Yokohama Quarantine Station, Center for Inspection of Imported Foods and Infectious Diseases (MHW Import Analytical Laboratory).
4. Japanese Ministry of Agriculture, Forestry and Fisheries, (MAFF) Plant Protection Division.
5. National Institute of Hygienic Sciences.
6. Japan Fresh Produce Import Facilitation Association.
7. Japan Marine Products Importers Association.
8. Japan International Cooperation Agency (JICA).
9. U.S. Embassy Counselor for Development Cooperation (USAID Representative in Japan).
10. U.S. Embassy Office of Agriculture Affairs.

HONG KONG

1. Hong Kong Department of Health (responsible for imported foods.)
2. Government Laboratory of Hong Kong (associated with DOH).
3. ETAK International (importer of fresh and frozen fruits and vegetables and chilled meats).
4. Kinong Group Ltd. (importer of fresh vegetables).
5. Eurosia Holdings Ltd. (seafood importer (primarily)).
6. Lucullus Food and Wines Ltd. (a food service firm — imports multiple food types including fresh and processed fruits, vegetables, seafood and meat/poultry).
7. Dah Chong Hong, Ltd. (seafood importer).

SINGAPORE

1. Ministry of the Environment Food Control Section (has ultimate authority for control of imported foods).
2. Fisheries Division, Primary Production Department, Ministry of National Development (lead fisheries agency).
3. Agriculture Division, Primary Production Department, Ministry of National Development (lead agriculture agency).
4. Singapore Fruit Importers and Exporters Exchange Pte. Ltd. (fresh fruit, vegetable importer).
5. Seafood Industries Association of Singapore (SIAS: primary seafood importers/re-export group).
6. Be Fresh Co. (fresh fruit and vegetable importer).
7. Chop Nam Huat Co. (fresh fruit and vegetable importer).

KOREA

1. Korea First Family Corporation (processed foods importer).
2. Ministry of Agriculture, Forestry, and Fisheries, National Animal Quarantine Service.

3. Ministry of Health and Social Affairs, Food Circulation Division (imported foods control agency).
4. National Institutes of Health, Food Specification Division (involved with imported foods).
5. Korean Advanced Food Research Institute (involved with imported foods).
6. Ministry of Agriculture, Forestry, and Fisheries, National Plant Quarantine Service.

INDONESIA

1. USAID Mission
2. USAID Agribusiness Development Project (ADP)
3. Ministry of Agriculture, Agency for Agribusiness Development (Badan Agribisnis).
4. Horticultural Export Assoc. of Indonesia.
5. Association Kakao Indonesia (ASKINDO).
6. Department of Health, Food Control Section.
7. Bulog — National Logistics Agency.
8. National Agency for Export Development (NAFED).
9. Ministry of Agriculture, Directorate General of Fisheries.
10. Food and Agriculture Organization, Integrated Pest Management Program.
11. Sucofindo
12. Indonesian Food and Beverage Assoc. (by phone).

NEPAL

1. USAID/Kathmandu Office of Agriculture
Office of Environment
Office of Economics/Private Sector
2. ATS Project (Chemonics)
AgroEnterprise Center (AEC)
3. National Agricultural Research Institute
Dept. of Entomology
Vegetable Development Division
4. Himalayan Floratech Pvt. Ltd.
5. Himalayan Agro Health Foods Pvt. Ltd.
6. Canadian Centre for International Studies and Cooperation (CECI)
7. Asia Network for Small-Scale Agricultural Biotechnologies (ANSAB)
8. Dr. Satish Prabish — independent consultant (agric. development)
9. Ms. Karen Conniff — independent consultant (pesticide minimization)

THE PHILIPPINES

1. USAID Mission
2. USAID Agribusiness System Assistance Project (ASAP).
3. Department of Agriculture, Policy and Planning Division.
4. Philippine Chamber of Food Manufacturers. (Trade Assoc).

5. PHILFOODEX (Trade Assoc.).
6. PHILEXPORT (Trade Assoc.).
7. PHILRICE (National Rice Research Foundation).
8. Women Inventors Organization.
9. Bureau of Plant Industry.
10. Bureau of Agricultural Research, IPM Division.
11. Fertilizer and Pesticide Authority.
12. Asian Development Bank, Agriculture Section.
13. International Rice Research Institute, IPM Division.
14. Bukidnon Resources Co., Inc. (tomato processor)
15. Ciba Geigy Philippines — Farmer Support Training Division
16. First Cavite Agro (fruit/vegetable exporter)
17. Pentagon Farms (sweet corn)
18. Sariling Sikap (farmers coop — baby corn)
19. Save the Children (IPM program — Guimaraes)

SRI LANKA

1. USAID Mission
2. USAID Agriculture Enterprise (AgEnt) Project.
3. USAID Marketing and Enterprise Development (MED) Project.
4. USAID Mahaweli Agriculture and Rural Development (MARD) Project.
5. Agri DEV Company (a private agriculture development company).
6. Pickle Packers and Growers Ltd. (private firm specializing in gherkin pickle manufacture for export).
7. Ceylon Institute for Scientific Industrial Research (the primary government lead organization for technological development).
8. Dept. of Forensic Medicine, Faculty of Medicine (handles poison control matters including pesticides).
9. Institute of Policy Research (primary government authorized national planning organization).
10. Hiran Cordials Co. (microenterprise company manufacturing dried fruit products for export).
11. Daffy's Food Products (microenterprise company manufacturing sauces and chutneys for export).
12. Maxi House Poultry Processors (a domestic fresh/frozen poultry processor).
13. Tess Private Ltd. (seafood processor/exporter).
14. Ministry of Agricultural Development and Research (manages government agriculture research program).
15. Chemical Industries (Colombo) Ltd. (pesticides supplier).
16. Dept. of Agriculture Plant Quarantine Office and Pesticide Registration Office.
17. Fruit and Vegetable Exporters/Processors Assoc. (industry trade assoc.)

INDIA

1. USAID Mission
Office of Energy, Environment and Enterprise
Office of the Deputy Director
2. All India Food Preservers Association (Bombay and Calcutta offices).

3. Agricultural and Processed Food Products Export Development Authority (APEDA).
4. Indian Planning Commission.
5. Bureau of Indian Standards.
6. Industrial Credit and Investment Corporation of India, Ltd. (ICICI).
7. Geo-Chem Laboratories.
8. SGS India Ltd.
9. Grape Exporters Association.
10. Mahama Phule Agriculture University.
11. National Chemical Laboratory.
12. Mahagrapes.
13. Kalyani Agro Corporation Pvt. Ltd.
14. Chordia Food Products Ltd.
15. Central Food Technological Research Institute (CFTRI).
16. Indian Institute of Horticultural Research.
17. Vimta Laboratories, Ltd.
18. Deventer Agro Ltd.

Meetings were originally scheduled with the following organizations but were not held because of timing or other difficulties.

- Pesticides Association of India.
- Ruia Aquaculture.
- Pancham Aquaculture.
- Centre for Technology Development.

Additionally, the team presented a seminar for members and invited guests of the Confederation of Indian Food Trade and Industry (CFTRI). Dialogue occurred between CFTRI, meeting attendees, and the RAP team at this meeting but no formal meeting per se occurred with CFTRI.

BANGLADESH

1. USAID Mission
2. USAID Agrobased Industries and Technology Development Project (ATDP)
3. Bangladesh Ministry of the Environment
4. Beximco, Marine Food Division
5. Crescent Farming Complex (Crescent Group member)
6. Pesticides Association of Bangladesh
7. PRAN Agricultural Marketing Co. Ltd. (PRAN Food)
8. USAID Business Advisory Services Center (BASC)

A meeting with the Bangladesh Import/Export Association was scheduled but not held due to schedule conflicts.

UNITED STATES

USAID Asia/Near East Bureau Environment/Agriculture Staff

Date: Tuesday, 1 February, 1994. Attending:

Tracy Atwood, Agriculture Section Chief, USAID ANE Bureau.
Dennis Panther, RAP Project Manager, AID ANE Bureau.
Tim Miller, Environment Officer, AID ANE Bureau.
Steve Hawkins, International Agribusiness Specialist, USDA OICD.
John Bowman, RAP Environmental Services Specialist, DAI, Inc.
Mike Wehr, TAS, Inc.
Gary Jahn, Entomologist/IPM Specialist, AID ANE Bureau.

FDA Personnel

Date: 15 February, 1994.

Attending for FDA:

In person: Bill Cooper, Head CFSAN International Office
Frank MacKeith, CFSAN International Office
Eric Flamm, Office of Policy, International Policy Staff
By phone: Tom Gardine, Office of Operations, Division of Import Operations and Policy.
Julia Ho, Office of Policy, International Affairs Office, SE Asia Section.
Maritza Colon-Pullano, Special Assistant for Regulatory Issues.

Attending for USDA OICD: Steve Hawkins, Agribusiness Specialist

Attending for RAP: John Bowman, Mike Wehr

Meeting with FDA Office of Seafood

Date: 24 March, 1994. Attending for FDA Office of Seafood:

Richard Dees: Director, Division of Seafood Programs.
Sandra Whetstone, Chief Program and Enforcement Branch.
George Hoskin, Association Director, Office of Seafood.
Ivette Aguirre-Flores: International Relations Specialist, Policy and Guidance Branch.
Joe Holloway, Program and Enforcement Branch.
Linda Horton, Director, International Policy Staff, Office of Policy, Office of the Commissioner.

Meeting with National Marine Fisheries Service

Date: 9 March, 1994. Attending:

For NMFS: Steven Wilson, Deputy Director, Field Operations Unit
Irving Sackett, VMD, Inspection Services Division
Kenneth Aadsen, DVM, International Trade Specialist

For RAP: John Bowman, Mike Wehr

Meeting with the Agricultural Section of the Embassy of the Philippines

Date: 3 March, 1994. Attending:

Victoriano B. Leviste, Agricultural Attache, Embassy of The Philippines
Antonio I. Basilio, Deputy Chief of Mission, Embassy of The Philippines

Steve Hawkins, USDA OICD/FAS
John Bowman, DAI, Inc.
Mike Wehr, TAS, Inc.

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ANNEX C
REFERENCES

Literature Items Obtained Relevant to Pride of India Program

1. India Food Law and Standards, 1994.
2. Agricultural Commercialization and Enterprise Programme (ACE). Information Brochure.
3. Trade In Environmental Services and Technologies Programme (TEST). Information Brochure.
4. USAID/India Office of Environment Energy and Enterprise (E³). Information Brochure.
5. Agricultural and Processed Food Products Export Development Authority (APEDA). Information Brochure.
6. Financial Assistance Schemes. Information Brochure prepared by the Agricultural and Processed Food Products Export Development Authority (APEDA).
7. BIS; The National Standards Organization. Information booklet prepared by the Bureau of Indian Standards.
8. Eco-Mark Scheme. Information sheet prepared by the Bureau of Indian Standards.
9. Programme of Work (as on 1 April, 1994). Information booklet prepared by the Bureau of Indian Standards.
10. BIS Laboratories; an Overview. Information booklet prepared by the Bureau of Indian Standards.
11. BIS Certification Marks Scheme; Growing Incentives and Preferences. Information booklet prepared by the Bureau of Indian Standards.
12. The Standard Mark; The Many Ways It Touches Your Life. Information booklet prepared by the Bureau of Indian Standards.
13. National Chemical Laboratory, Pune. Information Booklet prepared by the National Chemical Laboratory.
14. From Selection to Production: Setting up a Food Processing Unit. Information booklet prepared by the Confederation of Indian Food Trade and Industry.
15. Research Programmes and Progress, 1992. Information booklet prepared by the Indian Institute of Horticultural Research.
16. All India Coordinated Research Project on Pesticide Residues (Indian Council of Agricultural Research). Progress Report 1991-92. Pesticide Residue Laboratory, Indian Institute of Horticultural Research. Information booklet prepared by the Indian Institute of Horticultural Research.
17. All India Coordinated Research Project on Pesticide Residues (Indian Council of Agricultural Research). Progress Report 1988-90. Pesticide Residue Laboratory, Indian Institute of Horticultural Research. Information booklet prepared by the Indian Institute of Horticultural Research.
18. Report on Assessment of Pesticide Residue Testing Laboratories of Asia. Report prepared for USAID by International Consulting in Food Control.
19. Vimta Labs Ltd. company information booklet.
20. Geo Chem company information booklet.
21. Mahagrapes company information booklet.
22. Chordia Food Products Ltd. company information booklet.
23. Kalyani House of Industries: A Profile; company information booklet.

Literature Items Obtained Relevant to Bangladesh

1. Draft Bill on Environmental Legislation, December, 1994.
2. Company information on PRAN Agricultural Marketing Co. Ltd. (PRAN Food).
3. Company brochure for BEXIMCO Marine Food Division.
4. Ciba-Geigy (Bangladesh) Ltd. Plant Protection Agriculture Division booklet on "Emergency Medical Treatment for Pesticides Poisoning."

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5. Pesticide Safety Card for Field Workers prepared by the Pesticides Association of Bangladesh.

List of Materials Received during April-June, 1994 RAP Trip to Asia

SOUTH KOREA

1. Value of foods (in U.S.\$) imported into South Korea by commodity type (HS code) for the years 1988, 1989, 1990, 1991 and 1992. (in Korean)

Source: Food Circulation Division, Ministry of Health and Social Affairs.

2. Amount (in kg) and value (in U.S.\$) of product detentions, by commodity, for 1991 and 1992. (in Korean)

Source: Food Circulation Division, Ministry of Health and Social Affairs.

3. Reasons for detention of food products, by commodity type, by cause, for 1991 and 1992. (in Korean)

Source: Food Circulation Division, Ministry of Health and Social Affairs.

4. Plants and Plant Products Prohibited Entry into Korea, 1993. (in English and Korean).

Source: National Plant Quarantine Service, Ministry of Agriculture, Forestry and Fisheries.

HONG KONG

1. Hong Kong Trade Statistics, 1992. Country by Commodity Imports.

Source: Census and Statistics Department.

2. Selected Portions of Chapter 132, Subsidiary Legislation, 1992. Specifically, those items relating to:

- a. General requirements relating to food businesses.
- b. Prohibited and restricted foods.
- c. Food and drugs (composition and labelling) regulations.
- d. Licensing of food businesses.
- e. Preservatives in food regulations.
- f. Colouring matter in food regulations.
- g. Food adulteration (artificial sweeteners, metallic contamination) regulations.

Source: Hong Kong Government.

3. Organization Chart of the Hygiene Division, Department of Health, 1993.

4. Summary of Chemical Analysis of Foods (from 1991-1993). By analyses performed (not specified by commodity type). Provides a listing of % of workload in relation to enforcement of food regulations, No. of tests performed and samples analyzed, and % of substandard samples.

Source: Department of Health.

5. Food Sampling for Chemical Analysis, 1993. Provides a listing of chemical tests conducted on all food samples, by analysis type, and the number of satisfactory and unsatisfactory samples.

Source: Department of Health.

6. Food Sampling for Bacteriological Examinations, 1993. Provides a listing of chemical tests conducted on all food samples, by analysis type, and the number of satisfactory and unsatisfactory samples.

Source: Department of Health.

7. Sampling of Imported Fruits, Vegetables, and Seafood from Indonesia, Philippines, India, and Bangladesh, 1993. Provides a listing of products sampled, numbers of samples taken, analyses conducted, and results obtained.

Source: Department of Health.

8. No. of consignments of seafood imported via air from Philippines, Indonesia, Sri Lanka, India, Bangladesh, and Nepal. January- April, 1994. Lists number of consignments and types of seafood.

Source: Department of Health.

9. No. of seafood Consignments surrendered for destruction at the Hong Kong Airport, by product type, by country from January - April, 1994.

Source: Department of Health.

10. A Guide to the Hazard Analysis and Critical Control Point (HACCP) System.

Source: Department of Health.

SINGAPORE

1. Singapore Trade Statistics, Imports and Exports, 1993.

Source: Singapore Trade Development Board.

2. The Control of Plants Act, 1993 (including rules pertaining to pesticides and prohibited pests).

Source: Government of Singapore.

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