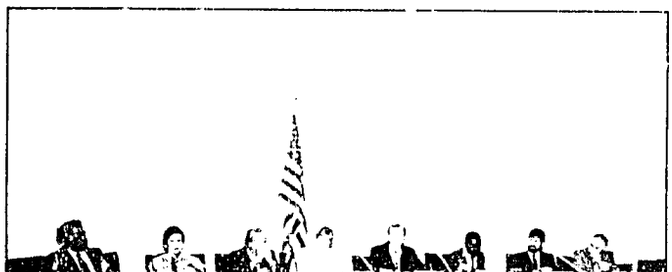
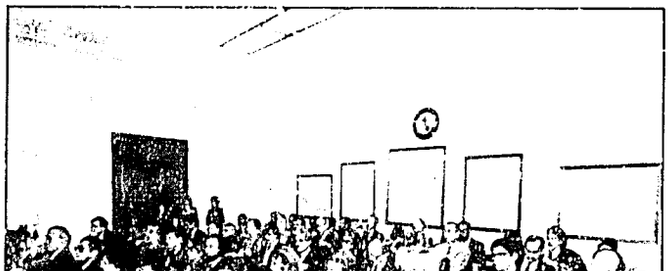
REACHING THE POOR MAJORITY VIA TECHNOLOGY TRANSFER & MICRO-CREDIT

Proceedings of the Forum:

"Appropriate Technology for Small Enterprise Development"





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APPROPRIATE TECHNOLOGY INTERNATIONAL

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THE PRESENTERS

Dr. Leobardo Jiménez Sánchez, Chair, ATI Board of Trustees, Director, Colegio de Postgraduados, Chapingo, Mexico

Dr. Jiménez is the Director of the Colegio de Postgraduados, Chapingo, Mexico. An agricultural engineer, he planned and implemented Plan Puebla, in which 100,000 Mexican farmers participated. By integrating research, evaluation and education of farmers, corn production increased on average from 1 ton/hectare to 3 tons/hectare. Dr. Jiménez joined ATI's Board in 1984 and became Chair in August, 1986.

Dr. Ton de Wilde, President, A.T. International

Dr. Ton de Wilde, President of ATI, is responsible for formulating ATI's focus on the need for commercially viable, economically sustainable, small enterprises. His qualifications as a mechanical engineer and a sociologist have served ATI well in developing a multidisciplinary aproach to starting market and technology driven businesses. Prior to ATI, Dr. de Wilde was Executive Secretary of the Sarvodaya Shramadana Movement (SSM)in Sri Lanka, responsible for program planning, implementation, and evaluation. SSM programs are found in more than 5,000 out of a total of 22,000 villages in Sri Lanka.

Barnabas A. Anguh, Director, CATMI, Cameroon

Barnabas Anguh founded Cameroon Agricultural Tool Manufacturing Industry (CATMI) in 1972 to manufacture and repair farm and agricultural products processing equipment. Mr. Anguh developed and manufactures the Anguh Maize Mill. This is the technology upon which the ATI Maize Mill project in Cameroon is based.

Dr. Malee Suwana-adth, Director, SVITA Foundation, Thailand

Dr. Malee is the Executive Director of SVITA Foundation in Thailand. SVITA received grants, among others, from ATI to implement a Small Enterprise Economic Development project (SEEDs) and a rhizobium inoculant project. Dr. Malee's background lies in the fields of microbiology and biotechnology. She has served as Director of both the National Center for Genetic Engineering and Biotechnology (Thailand) and the Industrial Research Department at the Applied Scientific Research Corporation of Thailand.

Ing. Oscar Arce, Vice Rector for Academic Research, Instituto de Tecnológico de Costa Rica (ITCR)

Ing. Oscar Arce is Vice Rector for Research at the Instituto Tecnológico de Costa Rica (ITCR). ITCR is a government institute of higher education dedicated to scientific research, extension services and the dissemination of appropriate technology for the development of Costa Rica. ITCR is ATI's project partner in the Costa Rica Lime Kiln project. Mr. Arce, a construction engineer, served as head of the Construction Engineering Department of ITCR for 3 years and also directed the Construction Division of Costa Rica's Ministry of Public Works.

Dr. Nyle C. Brady, Senior Assistant Administrator, S&T/RD, Agency for International Development

Dr. Brady is Senior Assistant Administrator for Science and Technology (S&T/RD) at the Agency for International Development (A.I.D.), where he has served since 1981. Prior to A.I.D., he was Director General of the International Rice Research Institute in the Philippines.

Dr. John H. Sullivan, Vice Chair, ATI Board of Trustees

Dr. Sullivan is the Vice President for International Activities, Development Associates, Inc., a management and consulting firm with headquarters in Arlington, Virginia. From 1977 - 1981 he served as Assistant Administrator for Asia at A.I.D.

George McRobie, Member, ATI Board of Trustees

Co-founder of the Intermediate Technology Development Group, Ltd., London, Mr. McRobie is the author of "Small is Possible." An economist by training, he is Visiting Professor at the University of Pennsylvania's Program in Appropriate Technology for Development.

Kristin Shannon, Member, ATI Board of Trustees

Kristin Shannon is the CEO of Canadian Trend Report, Inc. of Montreal, which provides economic and political forecasting for private and Crown corporations, and financial institutions. Author of "The Next Canadian Economy," she advises major Canadian corporations and the Canadian Government.

INTRODUCTORY REMARKS

George Ingram, Professional Staff Member, House Committee on Foreign Affairs

Welcome everyone. I am a member of the staff of the House Committee on Foreign Affairs. I bring you greetings and apologies from the Chairman of the Committee, Mr. Dante Fascell, who could not be with us this morning because he had to meet with President Duarte of El Salvador.

I would like to take this opportunity to make a few comments. Ten years ago, when the Committee wrote Section 107 into the Foreign Assistance Act, it was never the intent that ATI be an entity unto itself. The intent was that it serve as a test laboratory, as a resource bank for other aid organizations—A.I.D., the World Bank, other donors. When the Committee wrote Section 107, it did not provide detailed specifications as to what an ATI would be and do. I think the decision to write that legislation very broadly and let those with expertise design a living program that could respond to the needs in the field has proven correct.

I am very pleased to say that Mr. Fascell and the Committee are happy to be hosting the meeting today.

"Micro-enterprise finance not only helps people to help themselves, but it also contributes greatly to the political and economic stability of their nation."

Benjamin Gilman

Representative Benjamin Gilman, (R-N.Y.).

Good morning, ladies and gentlemen. It's a pleasure to be able to greet you and to commend you for the good work ATI is doing with developing nations. I'd like to take just a few minutes to talk about micro-enterprise credit, something that we are trying to foster in this year's foreign aid bill. Micro-enterprise finance not only helps people to help themselves, but it also contributes greatly to the political and economic stability of their nation. It's the old story of "give a man a fish and you feed one person, but teach him how to fish and you feed many people."

I am very pleased that ATI emphasizes small and micro rural enterprises. Micro-enterprise is intended to be the very lowest of enterprises—the smallest of enterprises. Micro-enterprises usually are found in the informal sector; the informal sector employs from 30 to 70% of the labor force in developing countries. This is a substantial portion of their economy. Informal sector enterprises, or micro-enterprises include the hawkers, the street vendors, those who sell goods and clothing, services and food in both urban and rural sectors. Up to 80 or 90% of economic activity in a village or a poor neighborhood in a developing nation is an informal sector enterprise.

There are many success stories with regard to micro-enterprises. Banks like the Grameen Bank in Bangladesh boast repayment rates of 98% or higher. Popular support for micro-enterprise finance in the developing world is growing each day.

Next April, here in Congress, we will be hosting a ministerial level world conference on micro-enterprise finance. We hope ATI will take part in that conference. Conferences such as yours today—and the one I just mentioned --help our political leaders gain a better perception of what can be accomplished by small enterprises. In conclusion, let me thank you for the work you are doing; I hope you can continue to focus your attention in this direction.

GEORGE INGRAM, of the House Committee on Foreign Affairs, welcomes attendees to the Forum on Appropriate Technology for Small Enterprise Development.

WELCOME

Leobardo Jiménez Sánchez
Chair, ATI Board of Trustees

For those who have actively participated in the design, operation, and evaluation of programs of Appropriate Technology International, this is a very important occasion. This is the time to recall and review the evolution of ATI—from an idea in the minds of U.S. legislators to the concrete achievements we will discuss today. This is the time to reflect on ways in which we can improve our work in the future. This is the time to discuss our successes and our failures; both are sources of knowledge. This is the time for constructive criticism, dialogue, and the strengthening of new relationships, to chart new paths for science and appropriate technology.

In 1976, in the closing statement of the proposal by the Agency for International Development for a program in Appropriate Technology, presented to the House Committee on International Relations, it was said:

> "Appropriate technologies are expected to contribute to employment, output and equity objectives, meeting the needs of the poor, and increasing participation by the poor in a number of ways. Emphasizing labor-intensity and employment of relatively unskilled labor will cause additional broadly-based employment of those at the bottom of society. Broad expansion of low but adequate income employment improves income distribution, contributing to a major social objective—equity.
>
> Encouraging the use of locally or domestically produced inputs emphasizes the backward linkages of an appropriate technology: its downstream effect on domestic employment and output.
>
> Small scale production allows regional dispersal of enterprises, especially over rural areas, each satisfying a limited market. Some governments consider this as an objective, as well as the regional self-sufficiency promoted by local industries using local inputs. Low-cost goods and services and compatibility with local culture emphasize that appropriate technologies are aimed toward the poor."

Ten years later we are able to see that making productive and appropriate technologies available to poor people, especially the rural poor, does create employment and increase income, particularly when they are used in small and micro-enterprise programs in the informal sector. We can see what Appropriate Technology International has done, and who has benefited, and to what extent. We can see that ATI's success depends largely on the efforts of the small farmers, artisans, small entrepreneurs, technicians and scientists, in developing countries, who have given us the opportunity to learn about the application of science and technology to development.

Today's forum begins with a brief overview by Ton de Wilde, President of ATI. We will continue with presentations by three of ATI's distinguished partners: Dr. Malee Suwana-adth from Thailand; Mr. Barnabas A. Anguh from Cameroon, and Ing. Oscar Arce from Costa Rica. This will be followed by the keynote address presented by Dr. Nyle C. Brady of the Agency for International Development.

"Our goal is a world in which everyone contributes to their own development, both with ideas and with practical actions and work."

Leobardo Jiménez

In conclusion, we have planned a panel discussion in which ATI Board members will participate. This open discussion will give us an opportunity to exchange ideas and experiences on how best to continue carrying out the mandate of ATI.

I recognize that science and technology play a key role in human and social development. These aspects of modern society are essential elements of all cultures of the world, and a common denominator for progress, human solidarity, and social organization. We at ATI—and by this I mean not only ATI staff, and Board members, but also our project partners in developing countries and the people in the field with whom we jointly work— should feel proud of what we have accomplished. We have found alternative solutions to many of our problems. We have learned. And we shall continue to strive to improve on what we have done.

We are committed to continually seek new avenues to enable science and technology to respond to the

needs and expectations of the men, women, and children in the less favored regions of the world. We are committed to socio-economic development. This does mean change—but any changes we introduce must preserve and improve our environment, physically as well as socially and economically. Our goal is a world in which everyone contributes to their own development, both with ideas and with practical actions and hard work.

We need to strengthen our capacity to learn from one another. This is the time to bring together reasoning and passion, intellectual thought and physical endeavor to find ways in which everyone can help create their own opportunities for a better life. I believe this vision embodies the spirit of ATI's founders, the energy and dynamics of its staff and project partners, and the exciting opportunities for the future.

ATI is a moving, inspiring, experimental organization. Let us continue to learn how we can best serve humankind, especially the rural poor in the Third World. It is these people—my people—our people—who represent the potential for the future, a potential yet to be mobilized and incorporated into modern society.

I now invite all of you to join in a frank and open interchange of ideas, to make this meeting a milestone in the bright future I foresee for Appropriate Technology International.

JOB CREATION COSTS... Ton de Wilde, ATI President, tells Forum audience that ATI can create new, sustainable jobs in Third World for $2,500 per workplace, including overhead costs. Leobardo Jiménez Sánchez, Chair of ATI's Board of Trustees (left) listens attentively.

LESSONS FROM THE PAST DEFINE ATI'S FUTURE

Ton de Wilde, President, ATI

I am very pleased to welcome so many guests today. Your attendance demonstrates your belief that small-scale productive enterprises are an important tool in the development process. When the House Foreign Affairs Committee suggested that ATI hold a forum to review ATI's progress over the past decade, I thought about the message we could share during this event.

I do not feel that we are here today to study the innovations ATI has made in technical areas—how the small-scale sunflower seed press was developed in Tanzania and how it is changing the lives of many people. Nor are we here to discuss the soft technology model ATI has used to provide small entrepreneurs access to capital and technology to start their enterprises. The stated purpose of this Forum should be to reflect on the reasons why the Congress of the United States passed legislation that authorized the Agency for International Development to establish a program in appropriate technology, a program to be implemented by a private organization using public funds.

More than ten years ago the legislature expressed concern that overall capital-intensive large-scale technology was not creating the jobs and the workplaces that would increase the incomes of the poor majority of the world's population living in the rural and peri-urban areas of developing countries. They called for an experimental program to develop and disseminate technology which "fit the incomes and limited resources of the small-scale farmers and the landless laborers." After an initial period of trial and error, which all new organizations experience, ATI established a successful program which is complementary to the mainstream approach to technology development. ATI didn't ask how large the technology must be to make optimum use of the economies of scale. Rather we asked how small can we make the technology so that it is productive, commercially viable and economically sustainable, yet appropriate to the resources of the poor? What is the smallest size enterprise that can make a profit? The program ATI developed in this fashion demonstrated not only that small is possible, but also that small is powerful.

Looking at the need for workplaces and jobs in the Third World that will be required by the year 2000, it becomes clear that we face a tremendous challenge. The only possible conclusion is that appropriate technology has become even more essential than was predicted ten years ago. ATI's experience over the past five years has shown that we can create new, sustainable jobs in rural areas of developing countries for

MUSHROOM GROWING ENTERPRISE is expected to be widely replicated. Here, production workers in demonstration project in the Philippines pound substrate, to be used in assembly of spawn bags.

$2,500 per workplace, including costs for overhead in Washington, D.C., and staff travel. Although this figure is high, and seems overwhelming if you compare it with the number of jobs needed in the coming years, it compares very favorably with the experiences of many of the international development organizations which estimate that on average $15,000 is required to create a workplace in developing countries.

In this process of establishing our program, we were taught "common sense." We learned that poor people are poor and do not have the money to buy the products of the enterprises that are established in their area, or to invest in those enterprises themselves. We had to provide them with access to credit schemes, to money and financial resources that would allow them to buy these products and to pay back, with the profits they earned, the loans they made to invest in these small enterprises. We had to find ways to create marketplaces where people could sell and buy their local produce.

We learned that poor people do not have resources to risk. Their decisions to spend time planting rice or corn or to spend time and labor to set up an enterprise are often matters of life and death. We cannot expect the very poor to take the risks that are inherent in setting up and establishing a new company. We need to find ways to share risks, to enable them to participate actively in their development process. One of the alternatives we explored were ways to adapt a model used here in the West—the venture capital model. We have used venture capital models, innovative credit schemes, purchase-lease arrangements, and profit-sharing mechanisms to enable these poor people to become risk takers and entrepreneurs.

"ATI does not ask how large the technology must be to make optimum use of the economies of scale. Rather we ask how small can we make the technology so that it is still productive, commercially viable, yet appropriate to the resources of the poor."

Tor de Wilde

Last but not least, ATI studied the relations among macro-policy, technology choice in the rural areas and market towns, and economic development. We understand that it is very important that ATI learns, with a reasonable rate of success, to establish small-scale enterprises in rural areas and market towns, but this is not enough. By just creating these demonstration projects, we do not attract the resources required to make the necessary investments to create the jobs and workplaces and increase the incomes as Section 107 of the Foreign Assistance Act specifies.

Often macro-policies prevent or hinder the flow of capital to rural areas. For example, due to government policies, capital in the rural sector of the Ivory Coast is on average 24 times more expensive than capital in the urban sector.

But these and other policy considerations might still give the world at large the wrong impression—that policymakers need only choose between large-scale and small-scale development or between capital intensive or labor intensive technology. This is only part of the reality. Governments are faced with a much more complex set of issues.

As was observed in the North South dialogue in the late '70s, the largest area of technology transfer, the largest activity that takes place between rich and poor countries is in the machinery of death, the training and supply of military and local police forces. Terrorism and violence, once seen as ways to enforce the political choice of ideological and dogmatic small groups of people, have become the last resort desperate young people turn to in order to gain a purposeful existence. Several times a day news reports remind us of the pressures poor people face in their struggle to survive. People, especially in rural areas, find they are unable to earn a living through productive activities and turn to violence. Their despair gradually is forcing more and more governments to invest in the transfer of military technologies at a time when these governments should be investing in technologies of creation, of innovation, technologies that give the poor majority a chance to participate in their own economic development.

How can investments in appropriate technology be made more effective? How can we lower the cost? How can we create self-multiplying, dynamic systems of credit and establish productive businesses in rural areas and market towns that give people a choice—a choice between violence and aggression or production and creation?

Two decades ago the world faced a major food crisis in The Sahel. Twenty years later we can see that investments made at that time, such as establishing the International Agricultural Research Centers, are slowly paying off. We can see that now we are able, or we have the potential to produce food, on a world level, to feed everyone. We do have problems of distribution, and a lack of ability to purchase the food, but there is potential to produce food to feed the world's population.

"We learned that poor people do not have resources to risk . . . We cannot expect them to take the risks that are inherent in setting up a new company. We need to find ways to share risks, to enable them to participate actively in the development process. ATI has used venture capital models, innovative credit schemes, purchase-lease arrangements, and profit-sharing mechanisms to enable these poor people to become risk takers and entrepreneurs."

Ton de Wilde

But how do we face the crisis of un- and underemployment? How do we provide a job, a meaningful job, for all the people presently on this earth who are capable of working? ATI has started to systematically experiment with approaches to this problem. Ten years ago appropriate technology was seen as counterculture gadgetry. Now it is a powerful instrument to create employment and increase the incomes of the poor in rural areas and market towns. ATI has worked at the basic levels of society. We have worked with village entrepreneurs and craftsmen. We have worked to forge the connections and links between the various institutions in the rural areas so they can strengthen each other. The people ATI has invited today to share their experiences with you are from those areas.

We have asked Mr. Anguh from Cameroon to tell you how he, a blacksmith, became a small entrepreneur. Now he can travel around the countryside and see people using his mills, and earning money they would not have had if we had not invested in his enterprise.

ATI also links institutions that work in rural areas with the science and technology community. We have acted as a catalyst to bring these groups together to help them make available scientific and technical expertise to solve the problems of small-scale production and credit availability in rural areas. That is why we asked Dr. Malee, head of the Microbiology Department of Katsetsart University in Bangkok, and an advisor to the Minister of Science and Technology of Thailand, to share her experiences in setting up SVITA and in developing a production process for rhizobium inoculant, that will bring this important natural fertilizer to even the most remote farms in Thailand.

Costa Rica is a country that has chosen to invest in the creation of jobs and development of science and technology to enable people in rural areas to make a living. Today from Costa Rica, we have with us Ing. Oscar Arce, the Vice Rector of the Institute of Technology. He will share with us the experiences of the lime kiln project in which science and technology were made available to cooperatives and private entrepreneurs in order to bring a dying industry back to life. He also will explain how this model of technology transfer has now become the backbone of the science and technology policy of the Government of Costa Rica.

ATI is grateful for the interest shown by the Congress of the United States and the Agency for International Development in our program for appropriate technology. Without their help and continuing support it would not have been possible to even take the first steps toward empowering the poor so they may participate in their own economic development.

At this juncture ATI has established a practical portfolio that works at the grass roots level. ATI has gained knowledge and insight of both the limitations and the factors in the macro-policy area that promote the use of appropriate technology. We now look forward to widening our activities with A.I.D. itself and with international development organizations. ATI just signed a Companion Ordering Agreement that will help us diversify, that will make us work with the U.S.A.I.D. Missions. We will be working with the World Bank. We are discussing a large program with the Indian Industrial Development Bank. We are now at the point where we can make available the knowledge and experience that we have gained in the last ten years to other institutions/groups/organizations. Together we will be able to give local politicians a choice, a choice between investing in protection from destruction or investing in development and creation.

"ATI can create new sustainable jobs in rural areas of developing countries for $2,500 per workplace, including costs for overhead in Washington, D.C. and staff travel."

Ton de Wilde

EXPERIENCES FROM THE FIELD

Barnabas A. Anguh, Director General,
Cameroon Agricultural Tool Manufacturing Industry (CATMI), Bamenda, Cameroon

I am extremely happy to be with you today and to be part of the festivities acknowledging ATI's practical approach to development which has greatly assisted our small businesses.

My country, Cameroon, received its independence in 1960. You can say I officially started in business as a village blacksmith making garden hand tools, local knives, and later even a sewing machine in Big Babanki in 1962. But my skill with tools and machines goes back even further than that.

Unfortunately, my parents had to depart from the world when I was small. My aunt decided to apprentice me to the village blacksmith. I became his boy and I grew up with him. In the 11 years I was with him, I was treated as a child, and not an apprentice. But I learned. I learned how to make so many things. When I was only 11 years old, after staying with the blacksmith for three years, I could make a finger ring so fine that no one could believe that a local African could do this type of work. This spirit carried over to many other implements and intensified over the years. I developed my skills in making knives, hoes, and other tools, as well as a local type of gun. Each time I produced a tool I refined my skills; I adapted the tool to the local conditions. People found it difficult to believe that these implements were being produced by a local—a simple, village man.

By 1972, I was producing coffee pulpers. (Pulpers remove the outer shell from the coffee bean.) I was producing about four pulpers per month. The market potential for pulpers and hand tools increased signficantly and we moved to Bamenda where electricity was available. That's when I established the Cameroon Agricultural Tool Manufacturing Industry (CATMI) to respond to the need for a local industry that could manufacture and repair farm and agricultural product processing equipment.

Today in Bamenda, we produce 150 coffee pulpers a month. We also have extended our product lines and today we also make plows, bullock carts, wheelbarrows, and maize mills. My company employs 15 full-time workers, including one woman, and both skilled and semi-skilled metal workers.

"I never expected my ideas to benefit me—only others. After years of disappointment, I was amazed that people from a developed country—the U.S.—would take seriously the ideas of a simple village man from a Third World country...ATI is a group that feels for the poor."

Barnabas Anguh

In 1985, ATI entered my life. About ten years earlier, I had built a model (prototype) diesel powered maize mill based on a locally available imported mill. I was convinced that such a maize mill would be practical and very useful to all my people and therefore would be something people would be willing to pay for —if I could produce it for the right price. However, at that time, I was not satisfied with the original model I had built and I set the machine aside. I did modify the design some years later....but it still was not what I wanted.

More years pass and now ATI has contacted me. Mr. Perry, the Project Officer, is very interested in my maize mill. But I am reluctant to accept ATI's help because of the very bad experiences I have had with other organizations. But your Project Officer, Mr. Perry, and your entire organization are not like the development groups I had contacted previously. The other organizations were only trying to impress others with the good they were doing. Yet, at the same time, they kept insisting that I do it their way, using their ideas. ATI brought in engineers, but they worked with my ideas and helped me redesign the maize mill.

I never expected my ideas to benefit me—only others. After all the years of disappointment, I was amazed that people from a developed country—and the U.S. at that—would take seriously the ideas of a simple village man from a Third World country.

My coming to this forum is my way of expressing my interest in what ATI is doing and is planning to do. I am here not because I have profited from ATI's help—although I have—but because I discovered ATI is a group that feels for the poor. Right now I can go around my country and see my people using my maize mills, my coffee pulpers, my other tools. With my own eyes, I can see that they are improving their lives...that they have more time and more money. But so many of my people still need help.

I hope that with the availability of more funds, ATI will help us to obtain some modern equipment, to enable us to meet the high demand for hand tools from the villages. So far, our major problems have been the lack of credit facilities to buy the equipment and the tools and machines produced. I want to invest my money in other products to help solve my country's food production problems so that we all benefit, economically and socially. To be able to do this is something I never, ever expected. I pray that ATI will continue to be able to help rural people like me, and to promote the development of local technologies in other parts of the world.

Dr. Malee Suwana-adth, Executive Director, SVITA Foundation, Thailand

First I would like to tell you a few facts about Thailand. Thirty years ago when I first came to the States people asked if we lived in a house or if we cooked our food before we ate it. Things have changed. But most people still know very little about our country. Thailand is still a very small country; fortunately we are still independent. We are one of the very few countries which has never been colonized. We are very proud of that. Thailand's population is growing...we are getting big. We now have about 54 million people.

The economy is not so bad. During these years of economic crisis, our economic growth, our gross national product (GNP) has averaged between 6 and 7% per year. This seems quite impressive, but it is also artificial — artificial in the sense that the economic disparity, the income disparity between the rich and the poor is growing wider. The technological gap is also widening. To address this concern, my colleagues and I set up a small agency called SVITA Foundation. It's a combination of people in science and technology, people in the business community, people from the government agencies and from the universities.

Now, I would like to briefly discuss two projects. One involves the promotion of technology-based small enterprises. The second project deals with efforts to commercialize an appropriate technology. They sound the same; but they are not. The first one centers on the value of technology. A research study by the Thai Technological Research Institute shows that agriculture is a risky business, if it is the only "business" in an area. One area of Thailand suffered a drought for three consecutive years. People who used to have enough to eat, to meet their basic needs, began to suffer.

We tried to analyze the situation to see what we could do. Fortunately, not far from that particular site was a dairy plant. Although the villagers at the project site did not have any knowledge of dairy technology, we decided to go ahead and try to promote dairy farming, since it was probably one of the few choices available.

Then we discovered that Thailand did not really have good dairy cows. Cows would need to be imported, at least a few. SVITA, being a very small entity, did not have enough funds to do this; we still don't. Using a contact of one of our Board members we tried to convince the Bank of Bangkok that we needed to help these people. The bank said "no" because in the past they had lost a lot of money trying to promote dairy farming in another province. We talked to the banker almost every day at her office and then at her home, because we happened to know her. We also pointed out that we would like to have women manage the program and we would work with women in the village.

Then the bankers started to listen. In Thailand, women are quite prominent in business and in finance. With our research data, we could verify that loans given to women have a very, very low default rate. The Bank agreed to finance the loans — not because the business investment appeared strong, but because they saw the value of the publicity. It only required 16 million baht — that's something like $US 800,000. For a large bank, the goodwill justified the loan.

Next, we asked the Embassy of New Zealand to help arrange the importation of some dairy cattle. They too, thought it was a good cause and they agreed. Then we talked to our Government. Each year, the Thai Government, to create rural employment, provides funds to some poor villages. Normally the money is used for small construction projects — water wells and road building. We asked the provincial government to build a road in the area where we wanted to start our project, and to start digging wells and water reservoirs.

In brief, we tried to mobilize resources — resources which actually were available but to different peoples at different times for different reasons. We tried to consolidate all these resources for the public good, at the right time, and for the right cause.

"ATI's ability to induce interaction and to get the people going toward a goal . . . to act as a catalyst . . . is far more important than the actual funding ATI provides."

Dr. Malee

Of the 82 family members representing households that we worked with, 80 were women (2 men happened to be single). In Thailand, traditionally men had to sign for loans. This time we asked that the women be permitted to sign as primary borrowers; their husbands would co-sign the loans. We asked the two men to serve as secretaries of the group. After three years, the project was generating income for all the participating families — the minimum earned was 3,000 baht per month (approx. $150). One hundred fifty dollars a month is the amount earned by a college graduate employed in a government agency. One hundred fifty dollars a month ($1800 per year) is the average annual income in Thailand. But, for the people in our project, the $150/month income is pure profit -- after deductions for all debts and other expenses.

In Thailand, up until our project was set up, it was impossible to insure live animals. Our project included this insurance -- again made possible through our contacts. After three years, this proved to be economically attractive for the insurance companies. It still is. Now, livestock insurance is available throughout Thailand.

The immediate target group was not very large — only 82 families. But we tried to provide both forward and backward linkages. As part of the program, we helped set up a small feed mill, so that those who did not have enough land to go into dairy farming could grow cassava or work in the feed mill.

We also introduced various technologies to make dairy farming and the feed mill profitable. These technologies include making silage, silo technology for storage of grains and for animal feed, cassava chip production. All these technologies were available in Thailand, but not to the target groups.

The dairy enterprise is a technology-based small enterprise. But the business came first, the technologies afterward, and they were adapted to fit the business. A later product of the program was the establishment of a new agency called "Friends of Women's World Banking." The bank, when it agreed to provide the loans for the cows for the 82 families, asked for some guarantees. We did not have enough money, so they asked a few NGOs to come up with the funds. Then we approached the Women's World Bank, here in the States, to help co-finance some of the guaranteed funds. Rather than set up a branch of the U.S. Women's World Bank, we then set up a new association of NGOs — Friends of Women's World Banking Association. Any NGO can join this association. For each dollar the NGO deposits, they have access to a minimum of $2.00 in credit. The NGO can also benefit from the interest earned. With this kind of arrangement the bank agreed to charge 1% less interest on loans than usual.

This is very good for the Thai NGO mentality. No matter how small the artisan, you like to be independent. This way small NGOs with $10,000 can benefit, as can larger NGOs with a few million dollars. Each has its own goals. I really am very proud of this association. As of the beginning of this year — the FWWB (Friends of Women's World Banking) — established a marketing arm called World Women's Enterprises, to help market products developed by our clients.

In the second instance, we tried to commercialize a particular technology — a bio-fertilizer technology, known as rhizobium inoculant. In Thailand now chemical insecticides and chemical fertilizers are being used to a greater degree than necessary. I believe that certain technologies such as bio-fertilizer are needed to improve the natural resources of the environment.

We work with farmers who grow soybeans, mungbeans, and peanuts. The fertilizer can also be used for pasture development and for other purposes. The technology is considered to be somewhat sophisticated for the rural people. But I believe our people can benefit from this product of technology. So we tried to scale the technology down.

This particular technology had not been known to be commercially viable on a small scale. Normally it is a centrally produced product that needs to be kept in cold storage/ refrigeration. To get around those problems, we set up a small production factory right in the village. Within the past year, the technology was proven technically viable. It looks like it should also prove commercially viable, but because of the high tech aspect, we need time to educate village farmers, we need time to educate government people, and we need time to educate the business people. Actually, this bio-fertilizer had been produced on a small scale, but only at the University. However, at the University, you cannot make a sustainable product because University people aren't seeking profits — they look for technology and achievement. To prove commercial viability, it is necessary to move the technology into the business world, and we are now in that process.

RHIZOBIUM INOCULANT packaged in aseptic growth medium is examined by Malee Suwana-adth, SVITA's Executive Director.

These two cases show that we need a small enterprise approach to development based on appropriate technology, and, in Thailand, we also need to target women.

Small enterprise has long been neglected, particularly by developed countries, which prefer to do things on a larger scale. I am very pleased this morning that representatives of developed countries are here to discuss small enterprise development. We need a big voice from big countries to emphasize the need for small enterprise development, especially to our government and to our policymakers. I thank you for the opportunity to help in this cause.

Ing. Oscar Arce, Vice Rector for Academic Research, Instituto Tecnológico de Costa Rica

Thank you ladies and gentlemen. Let me first express my deep satisfaction for this opportunity to speak before you and convey our gratitude for ATI's help and encouragement.

Our work with appropriate technology and ATI goes back a number of years. In Costa Rica we had a variety of problems, among them a severe housing shortage. As you may be aware, in Costa Rica health and education have been major government priorities. We do have results we are proud of in these areas. Now our people are well educated and healthy. Education has also served as our most important impetus for creating an atmosphere of peace, hospitality, and solidarity. But, for a poor country like Costa Rica, paying so much attention to education and health has had its price. In the past 20 years not too many resources have been dedicated to another human priority--housing. It has been estimated that about a quarter of a million Costa Rican families need housing improvements of some kind. This represents the challenge of the '80s.

In seeking a solution to the housing problem, I shall try today to explain how we eventually found our present path—the way we best can incorporate science and technology in development. We found that only by bringing our research into the field, were we really able to help society. Too often scientific institutions chose a classical approach; research activities are seen as a goal in themselves and academics isolate themselves from immediate reality. ITCR, too, was guilty of this.

Because of the high energy consumption, the cement industry in Costa Rica is very dependent on fuel imports. This creates a problem for foreign currency payments. For this reason, cement is not, to a great extent,a local construction product in a rigorous sense. Almost everywhere in the world, Portland cement is probably the most important factor in the economics of the construction industry. In Costa Rica, concrete is the most widely used construction material. About 65% of the cost of concrete is due to cement. If we could lower the cost of cement, we could lower the price of construction—a very important factor in making housing available for the poor majority.

Looking for alternatives for cementitious materials made a lot of sense. We started concentrating on the physical and mechanical properties of a stream of materials, using a rather traditional approach. Lime was an immediate possibility and it was included as part of the testing process. Very soon, we found out that lime was not a good alternative, since laboratory tests did not yield good results. We were surprised by the laboratory studies because we knew that lime has been used successfully in the construction industry in many countries, especially some developed ones, for many years.

So we were forced to leave our ivory tower --the Institute— and go out into the field. We contacted the actual lime producers and everyone involved in the lime production process. What were our findings?

Chemical analysis showed that our lime didn't meet minimal requirements for the construction industry. But lime has a lot of environmental and agricultural uses besides construction—such as for soil or water treatment . More important, many of our people were economically dependent on traditional lime kilns for their income.

Early on, it became obvious that if we were to revitalize the lime industry we needed to improve the kiln. Traditional kilns are energy inefficient to a great extent and cannot complete the burning process. The main energy source was wood wastings from the timber industry, which is now declining due to deforestation—yet another problem. If we could improve the traditional kiln so that it used less wood, we might be able to make lime production more profitable.

"The Lime Kiln project with ATI made us aware of the vital importance of keeping in direct contact with our local people, our local communities. We need to leave our ivory tower in universities and make a field assessment of what our poor people need and want...This way we can better help them make positive changes in their lives."

Oscar Arce

Then, we could convince people to plant new trees in a nearby area, so that they would have a permanent source of fuel for their kilns. ITCR also was concerned because environmental and safety regulations were making the lime industry unprofitable. If the lime industry was driven out of business, what would happen to all those families who were dependent on the lime industry for their jobs?

At this time, ITCR first became acquainted with ATI. ATI encouraged us to submit a project proposal for upgrading the traditional kiln. ATI and ITCR could foresee that by improving the traditional technology, we could help all those people dependent on the lime industry to achieve a better social and economic status. More efficient lime kilns would result in increased incomes—and they could take care of their own housing needs.

From this project we learned a very important lesson. Seeking a solution to the housing problem did not necessarily mean that we had to limit our approach to the technical problems present in the housing industry

itself. A good alternative would be to increase the incomes of people who need the housing. If we can do that, they will have access to the housing market; with the money they earn they should be able to solve their own housing problem. It also meant that people might be better prepared to take care of their problems in a broader sense: that they themselves would find the solutions to many of their everyday concerns.

This specific experience made us aware of the vital importance of keeping in direct contact with our local people and our local communities. We need to leave our ivory towers in our universities and make a field assessment of what our poor people need . This way we will know where to concentrate our efforts and resources to help them make positive changes in their situation.

This approach has made a very important difference in policymaking at all levels. Overall, our housing project now has this type of orientation. We are slowly trying to implement projects in other areas based on this philosophy at an institutional level. Most important, during the design phase of our national plan for the development of science and technology, we have had an opportunity to share our experiences with people from government and private enterprises. What we learned from the lime project was instrumental in defining a similar strategy on a national level. In the future we will work together with our rural communities to better define their technological needs. By providing assistance to people engaged in a wide variety of small enterprises, we will be able to tackle the problem in a broader way. Instead of analyzing a specific activity, we will pay attention to a complete region and to all the small enterprises either presently in place, or needed. We will try to concentrate our efforts in specific communities to help these enterprises become more competitive and to improve their incomes. Even though we know this is only the beginning, we already have important results, not only from the technical, but from the economic points of view. Rural communities have changed their views about our role. We now are making contact with each other in a more natural way, and that means we can now cooperate on a more regular basis.

We must thank ATI for helping us, in turn, to be helpful. ATI's support and advice in this project have contributed to a better understanding of what has to be done to help the needy develop. We now are trying to promote a more aggressive program of technological assistance to better the administrative capacity of the ever increasing numbers of small and medium size enterprises in Costa Rica.

IMPROVING TRADITIONAL LIME KILNS in Costa Rica is revitalizing a dying industry. Working with ATI on this project taught ITCR that they must leave their ivory tower and work directly with local people to assess the needs of the poor.

MAINSTREAMING APPROPRIATE TECHNOLOGY IN THE DEVELOPING WORLD

Dr. Nyle C. Brady, Senior Assistant Administrator for Science and Technology, Agency for International Development

I am pleased to have this opportunity to discuss the important development tool we call "appropriate technology," the experience of the Agency for International Development (A.I.D.) with appropriate technology, and our view of how ATI's efforts mesh with and enhance some current A.I.D. activities.

For some time now, we in the Agency have realized that, within the context of research and development, the most productive route for many developing countries must include a major emphasis on "basics." By basics, we don't mean a lack of new and improved technologies, but rather an emphasis on small-scale, labor-intensive technologies that suit the people and the environment for which they are intended; technologies that support equitable economic growth without abusing the resources needed to sustain development.

This emphasis on basics is particularly relevant in relation to the agricultural sector. In fact, these desired outcomes are reflected in the Agency's agricultural strategy, which aims for increased incomes for the poor majority, and increased availability and consumption of food, while preserving the natural resource base.

For the past five years, ATI has creatively worked toward goals that are in line with those of the Agency. We are heartened by the obvious worth of ATI's projects, and are pleased that ATI has gained valuable experience that can be shared with A.I.D. missions and other A.I.D. collaborators.

When we talk about increasing the incomes of the very poor — the poor majority — we are automatically taking about appropriate technology. We are also talking about appropriate results — results that build self-esteem and dignity, as well as economic security.

Appropriate technologies do not drop like manna from heaven. While they may not require the intensive, costly research that produces large-scale, highly-mechanized technologies, they do require considerable research, and the kind of innovative creativity that takes into consideration the cultural and sociological factors too often neglected in the search for development tools.

Technology that is appropriate for the small-scale producer is not always easy to identify. Some years ago, IR36 — now the most widely-grown variety of rice in the world — was being tested at the International Rice Research Institute (IRRI). The researchers assumed that this faster-growing, disease- and pest-resistant rice variety would be adopted and grown primarily by moderate- to large-scale producers. In fact, we really had to guard the test plots because, as the word got out about this superior new rice, small-scale local farmers were coming by and stealing seeds. These farmers recognized that the new seeds were an appropriate technology for them. They understood,

KEYNOTE SPEAKER, Dr. Nyle C. Brady, of A.I.D., is greeted by Dr. Leobardo Jiménez Sánchez, Chair of ATI's Board of Trustees.

that many of the emerging agricultural technologies were appropriate for both large and small producers, and they just wouldn't let us get away with bypassing them. IR36 soon became — and still may be — the most widely grown food-crop cultivar or variety in the world.

One of the concepts we had in the early days of development was that poor, ignorant farmers and peasants were so tied to the past that they could not learn and change. There is no doubt in my mind that people will use new and improved technologies that fit their situation. Even if they can't read or write, they can see and evaluate the advantages.

The term "appropriate technology" has been defined any number of times, from many points of view, and with varying degrees of specificity. An appropriate technology can be simple, or it can be moderately to extremely complex. It is selected, tested and evaluated with the participation of everyone who is involved — the organization providing financial resources, the folks who are testing and evaluating the technology, and the people who ultimately use it to directly or indirectly improve their lives. Appropriate technologies use available natural resources in an efficient, non-destructive manner, and they are, by their very nature, financially and technologically available to the target group — the poor majority.

The concept of appropriate technology is not a new one. Since the mid-1950s, A.I.D. and its predecessor organizations have subscribed to the belief that small-scale, low-cost technologies have a significant place in development assistance. These efforts were formalized when appropriate technology was incorporated into A.I.D.'s mandate through section 107 of the Foreign Assistance Act of 1975. The Agency's interest in this innovative approach to development has grown and developed over time, and since 1983 has steadily moved toward a new level of excellence through our support and encouragement of A.T. International's modest, innovative demonstration projects.

Now, we come to the next step. What must we do to make the original AT investments pay off even more than they have to date?

I think A.I.D. and ATI agree that we need to successfully replicate promising demonstration projects. And that's not easy. I've traveled around the world looking at appropriate technology, particularly new pieces of equipment. What I see often reminds me of my eight trips to China during which I visited a total of 20 to 25 communes. In about half of these, they talked about their bio-gas production for cooking food, and showed us their kitchens. But, during all of these visits, I never saw one kitchen in operation; they were always "under repair." That technology was "appropriate" in the minds of government officials, but not for the people, because something prevented them from using it.

I've seen more demonstration projects in laboratories, in institutes, and in places that ATI and others are funding, than I have in the hands of manufacturers or, more importantly, in the hands of users. The best test of whether something is going to work is whether it can be successfully replicated. Replication ultimately must be in the hands of the users. We have given this step too little attention in the past.

Replication is cost-effective and can greatly expand the impact of scarce research dollars. Demonstration projects are a necessary, but expensive, way to introduce better technologies into developing countries. They are necessary in order to determine, in the field, what works in which circumstances, and what modifications will bring a promising appropriate technology into harmony with a particular environment. Replication is what makes this expensive process worthwhile. When an appropriate technology has been proven at one site, replication with some modification is more likely to be easily and successfully accomplished at other sites. At this point, the resources that went into creation of the new appropriate technology begin to pay off. The cost per site decreases markedly as the idea is carried to other sites and, eventually, to other countries.

Through the replication process, ATI is already getting greater returns from its investments. Often, with only limited modifications, profit-making small enterprises based on proven technologies can be successfully "transplanted" to another community, another country, and sometimes even to another geographic region. ATI actively seeks such opportunities to replicate the innovative elements of its successful demonstration projects, and their publications contain many examples of these activities.

Through a Companion Ordering Agreement, ATI's expertise in identifying, analyzing, and designing appropriate technology projects will become more directly and readily available to A.I.D. missions. This agreement will enhance ATI's ability to assist A.I.D.'s endeavors in small-scale enterprise development, and will broaden ATI's potential access to funding within the Agency.

The matching arrangement we have proposed, to be implemented after a suitable transition period, provides a challenge to ATI. Under this arrangement, A.I.D. annual core funding would match the amount ATI received from other sources, both inside and outside A.I.D., up to $3 million. Successful meeting of this challenge will result in both program and funding diversification, and will thereby secure ATI's future operations and independence.

A.I.D.'s mid-term evaluation of ATI's efforts concluded that appropriate technology "occupies an important niche in economic development assistance." We believe that ATI will continue to generate innovative ideas that are broadly constructive and useful. We know that a main focus of this endeavor will continue to be the ways to multiply positive outcomes that increase product yield, create employment, and generate income — the development goals to which ATI and A.I.D. are firmly committed.

PANEL DISCUSSION

FOCUS ON THE FUTURE: INCREASING INCOMES AND CREATING EMPLOYMENT

Moderator: John H. Sullivan, ATI Vice Chair
Panelists: Speakers and ATI Trustees
George McRobie and Kristin Shannon

John H. Sullivan

When ATI was created in 1976, I was a Staff Consultant for that Committee. I think it is particularly fitting that today we are meeting in this room —because it was in this room in 1974 that a group of Members of Congress—a self-selected group—first began talking about approaching development in a different manner—as if people mattered. That bipartisan group of Members of Congress included Dante Fascell, the current Chairman of the House Foreign Affairs Committee, who continues to be a staunch supporter of ATI. That group included Jonathan Bingham and Clem Zablocki, both of whom are deceased; Don Fraser who is now the Mayor of Minneapolis; Congressman Gilman, who addressed us earlier today. Wise people advised us: Ted Owens, Jim Grant, who now is with UNICEF, and Dr. Schumacher himself who came to talk to us about his ideas that "small is beautiful and possible."

At that time interested members of Congress felt that Section 107 of the Foreign Assistance Act would create an organization that would act as yeast to the rest of the development process; that it would leaven the entire development program being carried out by the United States, and possibly even by other countries and international organizations. It has taken quite a while for ATI to become that kind of yeast.

Today we have heard about some of the work being done, with ATI's help, on three continents. The figures Ton de Wilde cited regarding the cost of creating jobs—the cost of creating workplaces— represent a breakthrough. We hope the rest of the development community will seriously study these figures. I think ATI has proven that it can do some things that other organizations have tried but have not succeeded in doing. I think that ATI's abilities are increasingly being understood by people in this country, and in foreign countries. Institutions all around the world, in India, Japan, the Netherlands, and the Philippines are willing to pay for the kinds of programs ATI is promoting.

Now I would like to introduce two of the panelists who have joined us this morning. George McRobie was a good friend of Dr. Schumacher. Through his books and in person, George has provided a great deal of the intellectual dynamic for appropriate technology, not just in the U.S. and his native United Kingdom, but throughout the world.

Kristin Shannon is the only founding member of the ATI Board of Trustees who continues to serve on our Board. I first met Kristin when the Board was about to be created some ten years ago. She, too, has had a vision of how ATI should operate and she continues to foster that vision. After the question and answer session I will ask Kristin to share some of her thoughts in the form of concluding remarks.

The floor is now open to any questions about the individual projects, the experiences of the project partners who are here with us today, or broader questions on ATI, its present work and its plans for the future.

Q: Could Dr. Malee elaborate on the distinction between the two different projects she discussed —starting a small enterprise versus commercializing a technology?

Malee Suwana-adth, SVITA Foundation

Naturally. The difference lies in the emphasis; in the first instance emphasis is placed on the business and in the second case on the technology. In the first case, the goal is to create employment from a dairy business. The goal of the rhizobium project I discussed is to commercialize a particular technology, which we believe will socially benefit the people. In reality, the environmentally-sound technologies often are less attractive for business consideration. Nevertheless, I think we need to push for both.

"Small enterprise has long been neglected, particularly by developed countries, which prefer to do things on a larger scale."
Dr. Malee

Commercializing a technology is difficult. The technology is considered a commodity that needs to be sold. Selling any commodity is not an easy task. When we try to promote small enterprise, we start from the business end, the market. Once we have identified the potential market, we can choose among several technologies. But when you commercialize a particular technology, the technology has already been defined.

Q: Once a demonstration project is judged to be successful, what happens? Do you further develop what you have tested? And, where do you get additional funds to do this?

Ton de Wilde, President, ATI

Let me answer the last question first. ATI now is negotiating with the Industrial Development Bank of India to set up five venture capital companies to stimulate small-scale enterprises based on some of the technologies we have developed in other parts of the world. We try not to look at a project in its narrow definition as a project—i.e. isolated, unconnected. When we look at a project we also try to look at the institutional infrastructure that surrounds the project. What resources can the local people call upon? How can we best focus attention on our activity?

Within that context, ATI has instituted a systematic monitoring system. Every quarter we analyze certain key variables—assumptions that we have made regarding the commercial viability of the product, and the social impact of the project-- and monitor these. Even before we begin developing a project plan, when an idea still is in the concept stage, we pay attention to its replication potential. In planning, we identify organizations and independent institutions that might be interested in applying that technology. We follow that up on a regular basis.

For example, one of ATI's very successful activities is setting up small-scale workshops to produce the ATI-Hotchkiss wheelchair. Right now there are more than 10 workshops—not only in Latin America—where the project began, but in Zimbabwe, Sri Lanka, and the Philippines. They all make the same model wheelchair. ATI provides training, a production manual and a standardized tooling set of jigs and dyes to ensure quality control and standardization of the product. While each of these workshops is operating on a very small scale, we are trying to incorporate some advantages in economies of scale normally associated with large-scale production.

Q: Are small enterprises less dependent on macroeconomic trends and political risks ? How does this affect planning?

Kristin Shannon, ATI Trustee

People dealing with policy in The North now are focusing on small enterprise because we've experienced 15 years of boom and bust in terms of volatility of commodity prices and are no longer confident that our product push can dominate a market in a consistent fashion when the market is maturing. Small enterprises are not trapped into this cycle because they can produce countercyclically. With a group of small enterprises, you also can create a more stable sub-economy. Without going into more detail, sustainability has become the principle criterion for success for both North and South.

George McRobie, ATI Trustee

Throughout Europe and North America, you can see the same forces and the same reactions. In Britain workers' cooperatives have been developing more rapidly than small private firms. The increase in workers' cooperatives over the past ten years has been phenomenal--something like 1,500 have been created. It is said to be the only growth industry in Britain, other than building warehouses to store imports. Other experiments are going on, like community cooperatives and other methods of ownership. This movement started on the West Coast of Ireland, spread to Scotland, and now is all over Britain. The search for sustainability and the reasons that Kristin mentioned are behind this trend.

Q: How does ATI provide training, especially for the period when you no longer are supporting a project?

Ton de Wilde, President, ATI

Over the past five years ATI has tried to focus its program in certain technology areas, so we do not engage in training as a separate activity. We do training as part of the program activities that we support, part of the soft technology package necessary to establish a commercially viable enterprise. To do this, you need to train people, and we use a variety of techniques. In Sri Lanka, we are experimenting with a combination computer/video package to train local people in spice growing—a productive activity. We do not have a general focus on training; our training is geared to a specific productive activity.

Ed Smith, A.I.D. Technical Manager for ATI

I would like to add to what Ton has just said. Basically what's unique about ATI's training is that you are using small non-governmental organizations in developing countries to interface with small enterprises. This is particularly true in your equity capital projects in Asia. ATI project officers and technical specialists are training people in NGOs who will then train the people who work in the enterprises. ATI is training the trainers.

Ton de Wilde, President , ATI

You are absolutely correct. For example, in Dr. Malee's program, we worked with SVITA; they in turn are training local NGOs and local small businesses.

Q: Is this training done by local people in country—for example by Thais who train SVITA or is the training provided by Washington?

Ton de Wilde, President, ATI

Training is mostly provided by local people. When local expertise is not available, we will bring in staff from our Washington office or from projects supported by ATI in other countries.

Q: If I am correct, ATI's strength is that it deals through local NGOs and in this way, affects other groups, other populations. In addition to this, do you think there is a need at the government level for specific policies that promote small enterprise development? If so, what would such a policy encompass?

Leobardo Jiménez Sánchez, Chair, ATI Board of Trustees

When we talk about development, we are discussing a joint effort, a continuing effort to reach the overall goals decided within a country's political framework. The key is letting the people participate and helping to show them that it is possible for them to do what they are trying to do. In the end, the politicians must serve the needs of the people; if not, what kind of politicians are they?

Q: But at the government level, aren't there efforts to restrain the technology? Bottlenecks are created. Is this because the government is opposed to the technology? Or are the bottlenecks caused by the lack of resources or the legal framework?

Maiee Suwana-adth, SVITA Foundation

Technologies, resources and government policy to foster appropriate technologies do exist but they need to be more effectively mobilized and promoted. What appears to be missing is the interaction between the resources and the needs of the people. For example, in Thailand three universities offer courses on rural enterprises. But the designers of these courses lack practical experience. I did attend a few of these courses and I brought some of the women from the dairy project to a course. They felt that it was not what they needed in their day to day productive activity. SVITA's role is to identify the needs of the people and feed them back to the university. We also simplify some of the university's research findings. I explain it as translating from academic Thai, or technical Thai, into practical Thai, the language of our people.

Lack of communication among the various groups creates the major bottlenecks. The role of NGOs is to bring the groups together, to act as a catalyst. ATI plays a similar role in development by acting as an external change agent. Organizations—even SVITA—need an outsider to get them moving. ATI's ability to induce interaction and to get the people going toward a goal is far more important than the actual funding ATI provides. In the dairy project, ATI provided only about 8% of the funding. But this was the seed money; this was the money used to tap other resources. And it was crucial. Governments do have money but this is not seed money. Major donors have a lot of money. But to get this money, you must show them something concrete.

WORKSHOPS that manufacture the ATI-Hotchkiss Wheelchair now are operating in eight countries on three continents. ATI provides a production manual, training, and a standardized tooling set of jigs and dyes to ensure quality control and standardization of the product.

Q: Mr. McRobie, would you care to answer this question—from a policy perspective? What would you do to get appropriate technology included in a policy for small enterprise development?

George McRobie, ATI Trustee

At the risk of oversimplification, I'll try to sum up the problems that you raise under three headings: first, knowledge; second, confidence; third, political will. The first, knowledge, is mostly a matter of getting reliable information about AT and how to make it work into the minds and hands of the rural and urban poor in developing countries. This can only be done effectively through field projects of the kind ATI has started around the world—projects which comprise packages of practical information including not only technology but also the right kind of local organization, marketing, credit, equipment manufacture, and R&D back up. We also need to get published information and training on such matters into the hands of local people who are going to operate projects and programs of AT.

The second issue, that of confidence, is a question of convincing administrators and other decision-makers, both in aid-giving and in aid-receiving countries, that AT offers the only feasible approach to the problems of mass underemployment and rural decay now looming over the Third World. AT is the only practical way to enable millions of poor people to work themselves out of their poverty. This requires a major effort of communication, to get across to decision-makers that AT offers a cost-effective, reliable way of solving the problems of poverty and stagnation, problems which the conventional "top-down" approach has failed to overcome. Relevant information must be spread in different ways: through publications, professional journals, the popular media, specialized seminars and conferences and through existing channels of higher education and training.

The older generation of administrators has to be re-educated—it is worth recalling that many of them received their training in Western universities at a time when the "trickle-down" theory was dominant. The same applies to many senior people in Western governments and international agencies. My old friend Hans Singer, the doyen of development economists, says that he once tried to introduce a rule that anyone drawing up a development plan for a country or region should at least have flown over it once, by daylight. For many years even this rule was ignored! So many of the older aid administrators need re-educating, and the younger generation should be exposed to relevant information about the practical possibilities of AT.

For the past few years, I've been associated with the postgraduate course in Appropriate Technology at the University of Pennsylvania. Many such courses are needed, in universities and colleges both in rich and poor countries, for the younger generation of aid and development administrators and business managers.

On the third aspect of your question, that of political will, I strongly urge everyone to read the recent book *Macro-Policies for Appropriate Technologies in Developing Countries*, edited by Frances Stewart and published with ATI's support. This reveals, through excellent case studies of different countries, how governments have tackled, or failed to tackle, their problems of rural poverty and deprivation. This is a very important book which deals with verifiable facts, not theories, and which shows how important are government policies—another name for political will—in promoting rural development through appropriate technology.

Many developing countries are, of course, run, or dominated by elites who may be nervous about distributing economic (and therefore political) power too widely. Studies such as those in this book on macro-policies will, I believe, make it increasingly evident that the real danger lies in NOT distributing economic power. The time cannot be far off when both rich and poor countries begin to understand that national security is achieved not by armaments, but by putting productive power into the hands of as many people as possible.

"Appropriate technology is the practical way to enable millions of poor people to work themselves out of their poverty."

George McRobie

John H. Sullivan, Panel Moderator

ATI now is sponsoring three conferences—one each in Asia, Africa, and Latin America—on macro-policy and appropriate technology. Although ATI is concerned with building up a country's economy at a grass-roots level, it also is very much concerned with policy issues.

Q: I work for the World Bank and these types of policies are exactly the types of things we discuss with government authorities. Our problem is that it is very difficult for us to identify what is happening at the grass-roots level. I hope that with our administrative reorganization, we really do focus on sustainable development. The problem is that we will remain macro-people. The type of approach we have been discussing here today increases the pressure for us to consult at the local, the grass-roots level....we need to reorient our thinking to this level, to meeting identified needs.

John H. Sullivan, Panel Moderator

You just mentioned a major issue with which our Board has been dealing—the fact that some of the large donors don't do anything small. For that reason, ATI is moving toward a larger approach...undertaking

clusters of projects that will significantly increase people's incomes in a particular region..a part of a country. I'd like ATI's President to comment on this.

Ton de Wilde, President, ATI

Last year when we reviewed our experiences, we concluded that there were substantial reasons for ATI to change the context in which we work. A lot of donors prefer to invest a great deal of money in one project. We would like to do that—but in a number of enterprises in a particular area. We know that we can transfer the technical aspects of technology within a year. What we need to do is to reduce the cost of creating a workplace. Right now, our cost to create a workplace is about $2,500. Most of this pays for the managerial aspects of transferring business skills. But if you compare this cost with the need to create jobs, you are forced to ask, "Is ATI still working on appropriate technology?" Should appropriate be more like $100 or $150? I doubt if we ever will get down to that level, but how cheaply can we create a workplace that is sustainable? In that context we want to move to clusters of enterprises, clusters of small-scale activities. This way we not only will be able to evaluate the activity as to whether or not the enterprise is profitable but we also will be able to lower the costs to transfer business skills. We will be able to judge success against a better indicator of development: are the people in that region, and not just the people involved in that particular enterprise, increasing their incomes? The cluster approach will permit us to do that. At the same time, we will be able to present proposals to the donor community for much larger amounts; this strategy will allow ATI to package our program in a way that is more acceptable to larger donors.

Q: There always is a trade off between impact and size of funding, on one hand, and flexibility and capacity to deliver new things, on the other. Has ATI's Board thought about how large ATI can become and still retain its flexibility? What is the maximum size you can attain and still be what you are, rather than become another World Bank?

Leobardo Jiménez Sánchez, Chair, ATI Board of Trustees

We need to look at the mandate of ATI. Our major concern is people..our mandate is to develop our capacity to serve the people. If the people need money for a large project, they will apply to the Bank. ATI's role is to help people look at what they have, and what they want, and then help them see how they can go from A to B. When we do this, we are giving the people security..security for what they are..security for the role they can play in development. This is a process. This is not just granting money, making a loan. This is a process to energize the people in society to work for the society. This means participation. So, whenever a policy decision is made, we first need to look at what the people have, what they can do. ATI is planting the seed. Who is going to cultivate the seed? Who is going to harvest what has been planted? The people in the field..the small farmers..the small entrepreneurs....the local craftsmen.....not ATI. ATI is just learning and trying to transfer our knowledge to others—for their own benefit.

John H. Sullivan, Panel Moderator

I now would like to ask Kristin Shannon to summarize these proceedings. Following Ms. Shannon's comments, the panel will remain to talk to the audience on an individual basis.

PANEL MODERATOR John H. Sullivan introduces ATI Trustee Kristin Shannon.

Kristin Shannon, ATI Trustee

One of the advantages of continuity in Board membership is that it helps you develop a sense of perspective, and hopefully, a sense of humor. Yesterday I went back to my files and pulled out the letter that Mr. Dan Parker, then A.I.D. Administrator, sent me nearly eleven years ago today asking that I get ATI started.

In that letter I found a one sentence definition of appropriate technology, which I think imparts the thinking of that day. The sentence has a wealth of implications about North versus South. "We have been too slow to learn that we must help shape the tools and techniques that are appropriate to the special characteristics of developing countries."

This is what we thought we knew about the developed world, back in 1976. At that time the North and South were, or presumed they were, on divergent paths. There were very strong contrasts between the kinds of issues that economists such as myself were facing when we were considering North issues versus the questions we were asked when we were considering South issues.

The North side had lots of confidence—about its commodities and its products. Our definition of wealth still was tied to large enterprise. Capital intensiveness was not an issue. We were selling. The North used the language of efficiency. When I was working with large corporate institutions or with other policy people, I was asked questions like: "How much, how fast, how many and how far?" Those were the criteria that were implicit in the notion of what might be successful or commercially viable.

A dozen years ago, productivity was the hottest ticket in town. Everybody was talking about productivity. In the North, very few people were seeing the connection between increased productivity, labor displacement, and increased burdens on the public purse.

By contrast, in the South, those of us who were starting a tiny enterprise were asking questions dealing with effectiveness rather than efficiency. Will this particular technology and activity suit the situation? Will the business employ enough people to justify the investment? Cost per job was an extremely important issue at that time. Can we afford to spend our scarce capital? If the money was seed money, we measured the competition. Seed money is the most valuable money in the world, because, as our Chair suggested, it is always highly competitive and thus implies the moral issue of choice.

What has changed in the last decade? A dozen years ago, ATI was a fringe experiment, a bit of a wink and a smile and a nudge, from the point of view of A.I.D. Now ATI is discussing integrating its activities with A.I.D. and other large institutions. Attitudes certainly have changed, and more so in the North than in the South.

Uncertainty came to live with us in the North. We no longer could forecast the cost of funds, interest rates or the price of commodities. Tremendous volatility characterized the marketplace. Uncertainty was a humbling experience for those involved in economic forecasting and enterprise design, and an extremely healthy experience.

A second major change in that very short decade was a dramatic shift in market structure. Ten years ago we knew what markets were. They fell on the bell-shaped curve. The majority was in the middle; fringe activities were on both sides. Since then, a terrific shift has occurred in the shape of the marketplace internationally. Studies of seven developed countries conducted by OECD conclude that the curve of market structure now resembles a straight line. This implies that there has been a substantial rise in niche markets, targeted markets, and finite markets. Markets that used to be considered" beneath contempt" are now considered extremely important by large multinational organizations and public policy analysts.

Why has this happened? The study reveals that in each of the seven countries, the driving force behind the change in markets has been increased education and the rise of women's participation in the workforce. These two trends are unlikely to be reversed in the next several years. Therefore, niche markets and target markets are going to be with us for the next several decades.

Today, the concerns of both North and South are converging. Here are six examples.

First, scale no longer is an issue. No longer am I asked "How fast, how many, and how much?" Large corporate institutions such as General Foods ask, "Will it fit?" or "Is there an appropriate match between resources and people and market?"

Second, the cost per workplace now is very important, in both the North and South. A decade ago, politicians in both the North and the South loved ribbon-cutting ceremonies, large plants, and megaprojects because they presented great opportunities for photographs. Now they look much more seriously at the real cost of that type of cyclical heavy construction and instant employment.

The third way in which the questions are converging is that the real employment benefits of an investment are calculated much more carefully, as well as the downside risks. We are much more concerned about the long term costs of megaprojects. We are much more interested in creating sustainable incomes.

"Both the North and South have accorded increasing respect for small business. This is a very dramatic change, and it relates to the changes in marketplace and the sustainability of small business which is more adaptive in a turbulent environment."

Kristin Shannon

Fourth, the issue of commercial viability no longer is a matter of religious dispute. I remember that ten years ago the purists for intermediate technology didn't want to contaminate the process by talking too much about the profit motive. On the other hand, the purists for private enterprise now understand the need for technologies of appropriate size and scale.

Fifth, both North and South are gaining deeper respect for the wisdom of the marketplace. They agree that we are going to continue to live in a world with a multiplicity of highly diverse, targeted, niche markets. Finally, both the North and South have accorded increasing respect for small business. This is a very dramatic change, and it relates to the changes in marketplace and the sustainability of small business which is more adaptive in a turbulent environment.

In a very important way, our heroes have changed. We now talk a lot about small business and small enterprise. I was speaking with Michael Phillips, another ATI Trustee, who consults frequently for Japanese who are trying to learn how to run small businesses.

It's an interesting picture when you remember what we were doing ten years ago. Last night I looked at the cover of Scientific American. A very advanced technology is depicted on that cover and if you look at the picture very closely, you discover that there are 12 people in that company. It's not an advanced technology that came from IBM or Control Data. This advanced technology came from an institution that is on such a fast innovation curve and so clear about its mission that it has been on two covers of Scientific American in three years. These are our new heroes. They are working with information intensive activities.

When I look into the future, I return to what Dr. Nyle Brady suggested ATI will be doing over the next decade. I think the message he gave us this morning was, "Keep it moving out of the laboratory; make it pragmatic." I would like to add that in addition to improving our choices in serving the markets, we should continue to improve our criteria for economic development. This encompasses both the issues we choose to focus on and the measures, such as cost per job, that we bring to our choices in what is fundamentally a question of human growth and moral choice. Mr. Chairman.

John H. Sullivan, Panel Moderator

Thank you for that very thought-provoking final statement. I would like to conclude by thanking our three guests – from Cameroon, from Thailand, and from Costa Rica – who have taken time from their busy schedules to be with us today. I would appreciate your giving them a round of applause. Thank you all for joining us today.

VERTICAL CALTECH PALM OIL PRESS, used in ATI project in Cameroon, is more efficient than the traditional method or alternative village-scale technologies. It costs only 1/3 the amount of presses of similar efficiency.

CREATION OF ATI

Legislative History

On December 20, 1975, the International Development and Food Assistance Act of 1975 was enacted into law as Public Law 94-161. That act introduced a new section 107 into the Foreign Assistance Act of 1961 that authorized the Agency for International Development to undertake a new effort in the field of intermediate technology. Section 107 reads:

> Of the funds made available to carry out this chapter for the fiscal years 1976, 1977, and 1978, a total of $20,000,000 may be used for activities in the field of intermediate technology, through grants in support of an expanded and coordinated private effort to promote the development and dissemination of technologies appropriate for developing countries. The Agency for International Development shall prepare a detailed proposal to carry out this section and shall keep the Senate Foreign Relations Committee and the House International Relations Committee fully and currently informed concerning the development of the proposal. The proposal shall be transmitted to these committees no later than March 31, 1976, and shall not be implemented until thirty days after its transmittal or until passage by each committee of a resolution in effect approving its implementation.

House Report 94-442 explained the various provisions of the International Development and Food Assistance Act of 1975 as voted by the House Committee on International Relations. Regarding intermediate technology, that report states:

> This new section of the Foreign Assistance Act of 1961 permits a total of up to $20 million of the funds made available under sections 103-106 over the 3-year period covering fiscal years 1976-78 to be used for grants to support an expanded and centralized private effort in the field of intermediate technology.
>
> The experience of more than a quarter century of development assistance programs overseas has clearly demonstrated that much of the technology used in the United States and other industrialized countries is not well suited to the economies of developing countries. It is too big, it is too expensive, and it does not create the jobs needed to absorb rapidly expanding labor forces in countries which already have an abundance of labor. It is not appropriate for use on the very small farms and in the very small business enterprises that make up so much of the economic activity in the developing world.
>
> If the poor are to participate in development, as envisioned by the reforms enacted in the Foreign Assistance Act of 1973 and by this bill, they must have access to tools and machines that are suited to labor-intensive production methods and fit their small farms, small businesses, and small incomes. They must have access to technology which is neither so primitive that it offers no escape from low production and low income nor so highly sophisticated that is out of reach for poor people and ultimately uneconomic for poor countries—in short, *intermediate technology*.
>
> Accordingly, the bill adds this new section 107 to the Foreign Assistance Act of 1961 in order to impel A.I.D. to study proposals for an institute of intermediate technology and to develop a plan for expansion and centralization of private efforts in this field. It is not meant to limit the amount of A.I.D. funds used for other activities involving intermediate technology, which should be expanded as rapidly as possible.
>
> Among the objectives of such an increased effort in intermediate technology are the following:
>
> (1) To promote the development and dissemination of technologies appropriate for developing countries, particularly in the areas of agriculture and rural development, small business enterprise, and energy;
>
> (2) To identify, design, and adapt from existing designs, appropriately scaled, labor-intensive technology, and policies and institutions directly related to their use;
>
> (3) To formulate policies and techniques to facilitate the organization of new small businesses;
>
> (4) To engage in field testing of intermediate technology;
>
> (5) To establish and maintain an information center for the collection and dissemination of information on intermediate technology, and
>
> (6) To support expansion and coordination of developing country efforts in this field.

These objectives are based on the experience of the several institutes of intermediate technology that are functioning in both industrialized and developing countries.

The committee expects AID to begin immediately to develop its proposals for use of the funds authorized under this section, in conjunction with the private organizations now carrying out activities in intermediate technology and those which would be involved in a new effort, and to keep the committee fully informed during the planning process.

Senate Report 94-406, the report by the Senate Foreign Relations Committee on the same bill, outlines a similar purpose and intent concerning intermediate technology. That report reads as follows:

> The new section 107 of the Foreign Assistance Act of 1961 permits a total of up to $20 million of the funds made available under sections 103-106 over the 3-year period covering fiscal years 1976-78 to be used for grants to support an expanded and centralized private effort in the field of intermediate technology.
>
> The experience of more than a quarter century of development assistance programs overseas has demonstrated that much of the technology used in the United States and other industrialized countries is not well suited to the economies of developing countries. It is too big, too expensive, and does not create jobs needed to absorb rapidly expanding labor forces in countries which already have an abundance of labor. It is not appropriate for use on the small farms and in the small business enterprises that make up so much of the economic activity in the developing world.
>
> The new section 107 is designed to encourage AID to place greater emphasis on coordinating and expanding private efforts to develop and disseminate technology which is appropriate for the developing countries. It does not authorize additional appropriations.

"...interested members of Congress felt that Section 107 of the Foreign Assistance Act would create an organization that would act as yeast to the rest of the development process; that it would leaven the entire development program being carried out by the U.S. and possibly even by other countries and international organizations. ...ATI now has become that kind of yeast."

John H. Sullivan

APPROPRIATE TECHNOLOGY INTERNATIONAL TODAY

ATI Mandate

Appropriate Technology International (ATI) is a private, not for profit development assistance corporation based in Washington, D.C. It works with organizations and local businesses in Africa, Asia and Latin America to identify, assess, adapt, disseminate and transfer technologies, and establish commercially viable small and micro enterprises appropriate to the needs and resources of the poor in the rural and peri-urban areas of the Third World.

ATI was created in 1976 in response to an initiative by the U.S. Congress to provide "access to tools and machines that are suited to labor-intensive production methods and fit small farms, small businesses, and small incomes." ATI presently implements its program primarily with funds made available through the Agency for International Development under an agreement with the Bureau of Science and Technology, Division of Employment and Enterprise Development in the Office of Rural and Institutional Development. ATI may also receive funds from other sources and has carried out projects for the United Nations and the Governments of Canada and the Netherlands.

ATI works through nongovernmental organizations and private institutions to improve the capabilities of small businesses and entrepreneurs. ATI trains local people in the technical aspects of operating equipment, as well as in project planning, financial analysis, and management and administration. ATI places a high priority on an enterprise's commercial viability, its ability to create employment and generate income, the project's socio-economic impact on the rural poor, and the potential of the technology for replication elsewhere.

Projects undertaken by ATI are now focused in three technical areas: 1) agricultural products processing and use of agricultural wastes; 2) local mineral resource technologies; and 3) equipment and support for small farms. ATI has also supported truly unusual opportunities such as testing of computer video training and the establishment of small enterprises to manufacture the ATI-Hotchkiss wheelchair.

ATI has specialized experience in identifying, developing and implementing rural small-scale industry projects financed by venture capital companies. Its extensive network of contacts with other technology centers worldwide provides information on a variety of specialized areas within the appropriate technology and enterprise development fields.

EXAMPLES OF EXPERIENCE

Agricultural Products Processing: small-scale processing and extraction of edible oils; processing of cereals and staple foods; production of animal feed from agricultural byproducts; processing of fruits and vegetables; and design, modification and manufacture of hand and machine powered tools for oil pressing and maize milling.

Equipment and Support for Small Farms: small-scale applications of bio-technologies, such as rhizobium inoculant for increased soybean yields and protein-

enriched cassava for animal feeds; production and marketing of small farm implements; animal driven water pumps; small-scale rainwater catchment tanks.

Local Mineral Resources: small-scale production of cement and cementitious material; small-scale production and use of lime; production of ceramics, bricks and tiles; improvements in ovens and kilns, small-scale mining technologies.

At present, ATI has projects in 22 countries in Africa, Asia and Latin America and the Caribbean. These are:

Botswana	Indonesia	Colombia
Cameroon	India	Costa Rica
Kenya	Nepal	Dominican Republic
Mali	Philippines	Guatemala
Senegal	Sri Lanka	Haiti
Tanzania	Thailand	Honduras
Zaire		Mexico
Zimbabwe		Peru

ATI'S BUSINESS AND PRODUCTS

ATI's major "business" is to develop, demonstrate and replicate productive, income-generating technologies in developing countries. To do this, ATI:

- Tests innovative, development strategies based on applied science and technology to determine their cost-effectiveness and social appropriateness;
- Transfers successful innovations tested in commercially viable, small-scale enterprises from original site to other locations;
- Provides technical, financial, and managerial services to help local enterprises and institutions establish small-scale businesses;
- Works with host governments, banks, and local institutions which affect commercially-viable, medium and small-scale enterprises;
- Documents the experiences gained in its projects and the results of policy analyses and disseminates this information to development organizations, governments, and other institutions.

ATI's Staff

ATI's multi-disciplinary, multi-lingual staff includes experts in "hard" and "soft" technologies and support services.

Hard Technologies

Agricultural and Livestock Production
Building Materials
Farm Equipment
Food Processing
Industrial Engineering
Industrial Quality Control
Mechanical Engineering
Mining and Minerals Engineering

Soft Technologies

Accounting Systems and Financial Management for Small and Micro-Enterprises
Agribusiness
Computer Training and Programming
Enterprise Development
Information and Technology Transfer
Marketing
Micro-Credit
Venture Capital

Support Services

Contracting
Communication
Economic Analysis
Monitoring and Evaluation Systems
Commercial Analysis
Institutional Strengthening
Project Design
Commercial Analysis
Social Impact Assessment

ATI promotes market and private sector development by: 1) using nongovernmental organizations as implementing organizations to work with small enterprises; 2) focusing on the commercial viability of technologies and the promotion of small-scale profit-making enterprises; and 3) developing rural small-scale industry projects using innovative financing mechanisms.

PROGRAM MECHANISMS

ATI carries out its activities in a variety of ways:

Cooperative Agreement

ATI receives an annual grant from the Bureau of Science and Technology of the Agency for International Development to design, develop and implement the projects. ATI can work with other donors to expand the impact of its project programs.

Response to RFPs

An experienced multi-disciplinary staff with access to other sources of technical assistance gives ATI a strong capability to respond to specialized requests for proposals.

Other Proposals

Organizations within developing countries can submit proposals asking for assistance in ATI's areas of technology focus. ATI also submits project ideas to A.I.D. and other donors for funding.

ARIES *(Assistance to Resource Institutions for Enterprise Support)*

The ARIES project is intended to improve support services available to promote small and micro-enterprises (SSEs) in developing countries. ARIES 1) provides short-term assistance to A.I.D. Missions, PVOs, and other institutions supporting SSE development; and 2) develops an improved understanding of SSE support; and 3) builds the capacity of private voluntary organizations.

Consultant Services

Services are available in the following areas:

- Sector Assessments
- Policy Studies
- Project identification, analysis, design and monitoring
- Project implementation, including technical assistance
- Developing training materials for appropriate technologies
- Evaluation of programs and projects and design of evaluation methods.

"We need to successfully replicate promising demonstration projects. And that's not easy. I've seen more demonstration projects in laboratories, in institutes, than I have in the hands of manufacturers or more importantly in the hands of users."

Dr. Nyle C. Brady

MAIZE MILL DESIGNED BY BARNABAS ANGUH will provide rural households in Cameroon with access to milling technology. If women switch from 100% hand milling to 100% mechanized milling, the labor time saved and devoted to other farm activities is expected to generate supplementary production valued at approximately $US 200/household.

ATI PROJECTS AND PROJECT PARTNERS

AFRICA

BOTSWANA

Animal Driven Pumps
Rural Industries Promotions (RIP)/Rural Industries Innovation Centre (RIIC)

Brick Production
Southern Rural Development Association, Minerals Holding Trust (SRDA/MHT)

Grapple Processing
Thusano Lefatsheng (TL)

Lime Production
Southern Rural Development Association, Minerals Holding Trust (SRDA/MHT)

CAMEROON

Anguh Maize Mills
Association for the Promotion of African Community Initiatives (APICA), B.A. Anguh Agricultural Tools Manufacturing, Northwest Development Authority (MIDENO), Northwest Cooperative Association

Maize Planter
Association for the Promotion of African Community Initiatives (APICA), Cameroon Agricultural Tools Manufacturing Industry (CATMI), and the Northwest Development Authority (MIDENO)

Cameroon Dehuller
Ecole Nationale Supérieure des Industries Agro-Alimentaires du Cameroon (ENSIAAC), and MANUCYCLE

Composite Flour
Ecole Nationale Supérieure des Industries Agro-Alimentaires du Cameroon (ENSIAAC) and Institut de Technologie Alimentaire (ITA)

Medium-Scale Hammermills
Ecole Nationale Supérieure des Industries Agro-Alimentaires du Cameroon (ENSIAAC), and Association for the Promotion of African Community Initiatives (APICA)

Palm Oil Extraction
Association for the Promotion of African Community Initiatives (APICA)

KENYA

Ceramic Lined Jikos
Kenya Energy Nongovernmental Organizations Association (KENGO)

MALI

Mini Dehullers
Compagnie Malienne de Développement des Textiles (CMDT), Division du Machinisme Agricole (DMA)

Shea Butter Extraction Units
Compagnie Malienne de Développement des Textiles (CMDT), Division du Machinisme Agricole (DMA), and Centre d'Echanges et Promotion des Artisans en Zones à Equiper (CEPAZE)

TANZANIA

Improved Bricks
Center for Agricultural Mechanization and Rural Technology (CAMARTEC) and Meru Earth Works, Ltd.

Rural Potteries
Center for Agricultural Mechanization and Rural Technology (CAMARTEC), and Sheriff Dewji and Sons, Ltd.

Oil Press Production
Center for Agricultural Mechanization and Rural Technology (CAMARTEC), Themi Farm Implements and Engineering Company, Ltd. and Institute for Production Innovation (IPI), University of Dar-es-Salaam.

Village Oil Processing
Evangelical Lutheran Church in Tanzania, Lutheran World Relief.

ZAIRE

Hydro-Powered Grain Mills
Société de Développement Rural du Zaire (SODERZA)

ZIMBABWE

Agro-Industries
Foundation for Education with Progress (FEP)

ASIA

INDIA

Integrated Potato Processing Technologies Project
Society for Development of Appropriate Technology (SOTEC)

Venture Capital Project
Venture Capital for Application of Appropriate Technology (VCAT)
Industrial Development Bank of India (IDBI)

INDONESIA

Venture Capital Company
Yayasan Dian Desa (YDD)

NEPAL

Turbine Driven Agro-Processing
New Era

PHILIPPINES

Organic Fertilizer
Filipinas Foundation, Inc. (FFI)

Rural Small-Scale Industries Development
Filipinas Foundation, Inc. (FFI)

SRI LANKA

Cinnamon Processing
Appropriate Technology Consultants (ATC)

Computer Video Training
Dasuna Enterprises, Ltd.

Mahaweli Rural Industries
The Mahaweli Authority of Sri Lanka

THAILAND

Protein Enriched Cassava
Population and Community Development Association (PDA)

Rhizobium Inoculant
SVITA Foundation

Rural Small-Scale Industries Program
Population and Community Development Association (PDA)

LATIN AMERICA & CARIBBEAN

Regional Projects

Linares Pump
Save the Children Federation (SCF)

Wheelchair Production (Colombia, Peru, Guatemala, Honduras, and the Dominican Republic)
Fundación Carvajal (Colombia), Fundación Hondurena de Rehabilitación e Integración del Limitado (Honduras), Centro de Rehabilitación Vocacional (Guatemala), Programa de Ayuda a Pequenas Empresas (Dominican Republic), Centro de Ingenieria Para el Desarrollo Laboral (Peru), Ralf Hotchkiss and Associates (USA)

COSTA RICA

Lime Kiln Technology
Instituto Tecnológico de Costa Rica (ITCR) and Cooperativa Nacional de Productores de Cal (CONAPROCAL)

DOMINICAN REPUBLIC

Swine Feed
Centro de Investigacion y Mejoramiento de Producción Animal (CIMPA)

GUATEMALA

Wool Production and Processing
Fundación Para el Desarrollo Integral de Programas Socioeconomicos (FUNDAP)

MEXICO

Farm Support Enterprises
Centro de Ensenanza, Investigación y Capacitación para el Desarrollo Agricola Regional (CEICADAR), Colegio de Postgraduados de Chapingo

PERU

Annatto Production
Centro Andino de Desarrollo Rural Pachacutek (CADER)

Placer Mining Equipment
Comité de Economiá y Desarrollo de las Comunidades Campesinas de Acora (CEDCA-PIAT)

Potato Based Foods
Centro Ideas