Appropriate Technology International

1992 ANNUAL REPORT

APPROPRIATE TECHNOLOGY
INTERNATIONAL
1331 H Street, NW Suite 1200
Washington, DC 20005
Telephone: 202 879 2900
Fax: 202 628 4622
Telex: 64661ATI
E-mail: EcoNet: atintl
Andrew Maguire, President

IN BOLIVIA:
Casilla 6032
La Paz, Bolivia
Telephone: 591 2 814451
Fax: 591 2 814450
William Gschwend,
Program Director

IN SENEGAL:
B.P. 49
Dakar, Senegal
Phone: 221 254523
Fax: 221 232965
Telex: 21793 AMEMB SG
Ed Perry, Program Director

IN TANZANIA:
P.O. Box 1409
Arusha, Tanzania
Phone: 255 57 6783
Fax: 255 57 8231
Telex: 42041 PANKER TZ
Lynn Schlueter, Project Manager
Dallas Granima,
Senior Field Manager

IN THE PHILIPPINES:
7-E Vernida 1 Bldg.
120 Amorsolo St.
Makati, Metro Manila
Philippines
Phone: 63 2 85 28 87, 87 33 54
Fax: 63 2 521 7225 (Att. ICS #528)
Telex: 40404 TX BX 5213
Lito Lim, Accounting and
Operations Officer

Cover:
By addressing massive pollution problems, ATI and its partners leave room for small textile businesses to grow in Rajasthan, India.

Contents



POINT OF DEPARTURE

Equal Opportunity for Small Producers

A philosopher once observed: "there is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success than to take the lead in the introduction of a new order of things."

Picture a Guatemalan shepherd tending his flock. His mountain valley is remote and seemingly timeless, but his business plan is thoroughly modern. To increase and improve the fiber he sells to local artisans — and earn more income for his family — this particular entrepreneur has reworked every step of his production process, from pasture management and animal husbandry through shearing, cleaning, and grading for the market. He's not alone. Sixteen thousand feet up in the Bolivian Andes, alpaca herders are refining successive stages of their work to target high fashion clothing manufacturers in Western Europe. Halfway around the world, Nepalese shepherds — scrambling to compete with New Zealand wool imports and supply their domestic carpet industry — are considering a similar top-to-bottom review of what business theory calls their "value-added chain."

Women and men the world over are striving for a better future — starting now — for themselves, their families, and their communities.

Picture the family in rural Africa that risks its savings on a locally made, manually operated machine that presses seeds into edible oil. The work is strenuous, but the nutritional and economic benefits are swift and tangible — so much so that the number of rural processors is rapidly multiplying. Today close to 800 risk-takers across Tanzania are producing millions of dollars annually in new rural income, while cutting back on costly hard currency cooking oil imports. Across East and Southern Africa, oilseed entrepreneurs are following suit.

The development lesson ATI lives by is this: there is no greater engine for progress than practical

people striving for a better future. Generally speaking, however, individual producers lack ingredients essential to success. Large companies hire staff to monitor the marketplace, scrutinize the competition, employ and develop new technologies, determine environmental costs and benefits, scour out new sources of financing, and devise business plans that enhance productivity and profits. Small entrepreneurs typically must fend for themselves with fewer resources in every respect, save drive and determination.

Be they fiber producers, oilseed entrepreneurs, or textile manufacturers like those featured on this report's cover, ATI's job is to help the small producer groups it serves position their business ventures to succeed. Adding systematic value chain analysis and staff expertise to their innate skill, creativity, and capacity to grasp opportunities can yield sustainable livelihoods for millions of women and men, families, and communities around the globe. Doing so is key to equitable, long-lasting progress.

ATI's approach to development cooperation is as rooted in the real world as the people it serves. Millions of small producers in basic industries worldwide — people who produce and process fiber, cooking oils, milk, fruits and vegetables, cereal grains, and tree crops like cashews, coconut, and coffee — face very similar challenges. They operate along value-added chains that they find difficult to adapt to rapidly changing environments. Their levels of human and natural resource development are strikingly similar. Solving their production bottlenecks generally requires the same families of hard and soft technologies, management skills, and financing options. And their access to good markets is limited by a comparable set of restraints.

ATI and its local partners work directly with small producers to devise an improved business plan for an entire economic subsector. Once this plan is tested under varying conditions — with new partners and producers — ATI's job then shifts to diffusing this improved plan through a variety of networks to the benefit of small producers in that subsector worldwide. This opportunity to help many millions of people build newly productive lives — and thereby to make their local and regional economies more competitive — is what propels all of us at ATI. A project here, a project there does not equal sustainable development. With the lives of hundreds of millions of people and quite possibly of the planet itself at stake, it would be a breach of trust to allow ourselves to be satisfied with local demonstrations. We must stretch ourselves to successfully reach the millions in the major groups of small producers we serve.

Partner organizations across the developing continents form the framework for action — small producer associations, women's organizations, innovative development banks, church-based institutions, and other strong citizens' organizations. Their work is back-stopped by international teams of technical specialists and advocates based in La Paz, Dakar, Arusha, Manila, and Washington, D.C.

A growing number of large institutions are also ATI's collaborators: they include the United Nations Development Program (UNDP) and Spain's CODESPA Foundation in Latin America; the United Nations Development Fund for Women (UNIFEM) and India's Small Industries Development Bank in Asia; the International Fund for Agricultural Development and the World Bank in Africa; and U.S. Agency for International Development missions in all three regions.

We are seeking new, non-traditional channels

of support too. Together with a forward-looking foundation and a major private investment fund, ATI is developing one of the first U.S. financial instruments to capture capital from the North and put it to work among small enterprises in the South.

This report captures ATI emerging into a take-off phase where our ability to help our small producer clients and also our sister development organizations, be they international agencies or local groups, will magnify rapidly.

Since Congress launched ATI in the mid 1970's we have gradually learned how to meld technology, finance, business economics, environmental understanding, and the skill to work with first class grassroots partners into a staff that can help one class of small producer after another redesign and then actually change how they do their work. As the following pages illustrate, our work with several sectors of the economy using this approach has produced proven alternatives in varied demonstration communities. Our job now is to spread these alternatives, to expand the model of shepherds from Mexico to Mongolia. To do so, we must expand our current partnerships and build many new ones.

Everyone knows that small producers provide most of the jobs, are raising most of the next generation, and have both a stake in society and some independence. They are development's most dependable engine and democratic revolution's yeomen. Yet, for decades, the world's major development efforts have found reaching small producers effectively, or at significant scale, elusive. We hope the approach we and our partners are pioneering will change that.

Along with the Board and Council, we want to thank the staff and all our partners and friends for steadfastly sticking with our evolving new vision and creating the take-off opportunity we now have.

William Drayton

Andrew Maguire

ATI and its partners are working toward a new order for development that empowers people to build assets, enhances our natural environment, and leaves to all children a chance to carry on.

STEPPING STONES

Staff Support Along the Value Chain

The challenge ATI set for itself in 1992 was to complete a transition from project-based discrete development initiatives to a broad, systematic assault on the structural impediments to progress faced by large groups of small farmers and business people around the globe. To that end, ATI now targets a limited number of "strategic subsectors" — product specific economic subsectors with four essential characteristics.

For ATI and its partners, strategic subsectors are those of major economic importance where:

- Large numbers of small producers (across national or regional boundaries) engage in a common productive activity that adds significant value;
- Socially appropriate, proven, or "high probability" technical and management responses of interest to and adapted to the needs of farmers and entrepreneurs in these subsectors can be identified and commercialized;
- The integrated programs developed to increase productivity along an entire value chain have reasonable prospects for winning required levels of catalytic funding from public or private sector sources;
- The added value can be converted commercially into substantial new income streams through links to expanding markets.

In those subsectors where ATI believes it can work effectively, a comprehensive approach to small producer needs and opportunities sets a a high standard for successful development in three ways:

First, ATI conducts an integrated and inter-disciplinary assessment of each step of the value chain, based on its value-adding potential and the number of participants. This approach enables ATI and its partners to select and invest in an integrated set of interventions with the highest potential for small producer participation and expanding impacts.

Second, systematic productivity increases all along the value-added chain raise the total value of output from the subsector — as well as the share of this value that is captured by ATI's clients, the small-scale producers.

Third, business development rather than continuing subsidy is the touchstone. Throughout the production chain, small enterprises with sound business practices and commercial vitality promise greater staying power than development that relies on the support of externally-funded demonstration, extension, or other services.

Reinvention of ATI resulted in the launch in 1992 of two large-scale replication programs: (1) the alpaca herders and fiber processors program in Bolivia, and (2) the oilseed processors program for East and Southern Africa. Each incorporates a set of

> ***"ATI has strategies for large groups of small producers to identify improvements in technology, financing, and marketing, with demonstrated potential to significantly increase earnings... ATI's strategies define the state of the art among foundations in enterprise development."***
>
> **— David Korten**
> **People-Centered Development Forum**

integrated interventions along a small producer value chain built on earlier ATI commercial and technical successes that promise to change the lives of millions of small producers.

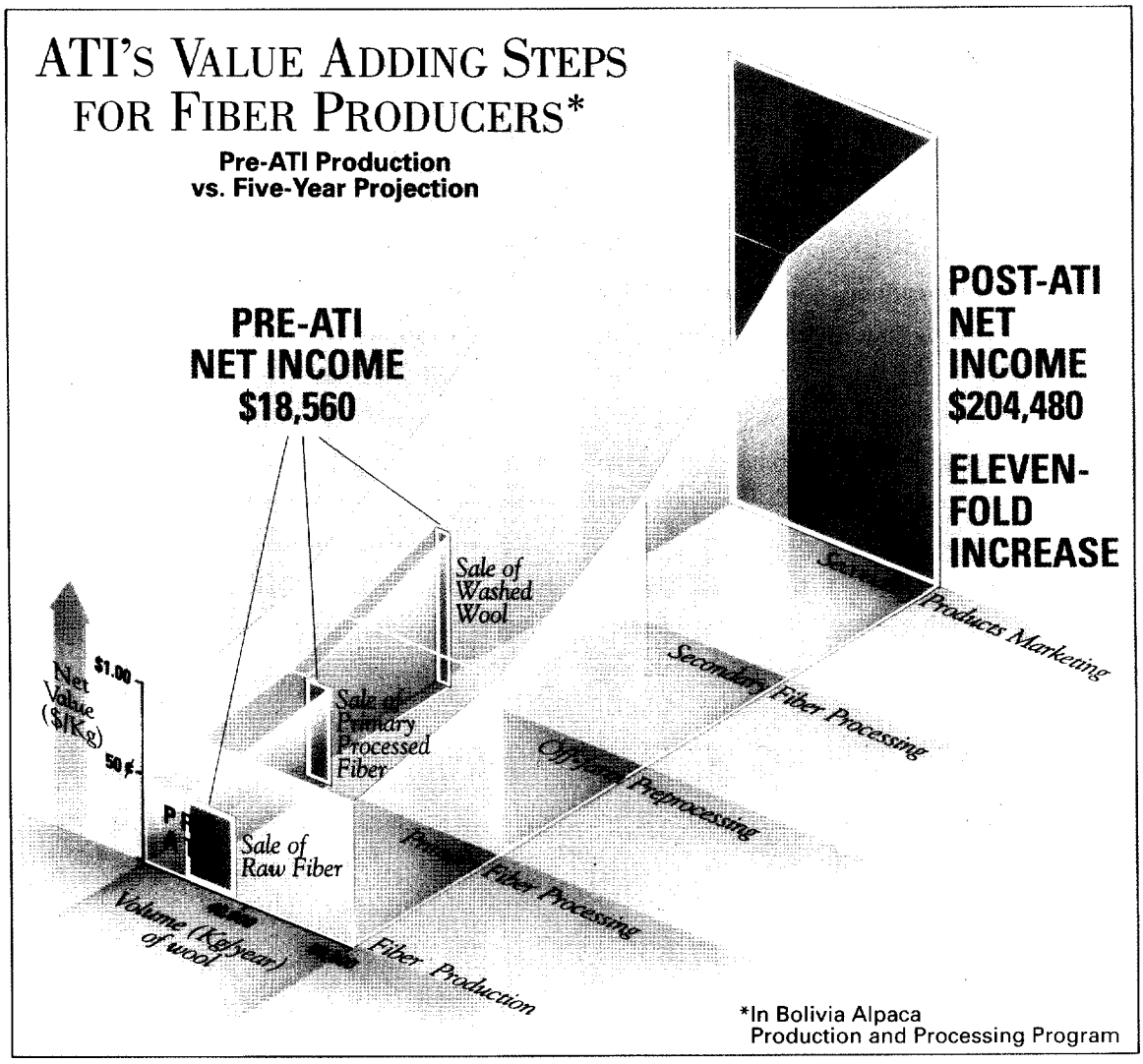
For example, ATI's programs in the animal fiber subsector began with the identification of a handful of generic steps in the production and processing chain, each representing a cluster of activities through which participants add value to wool. These steps may sometimes be combined or modified, but they consistently describe the value chain for producers of wool, alpaca fiber, angora, or any other animal fiber in scores of countries on every continent (see map on p. 13). While the specific circumstances vary from one region to another, ATI's small producer clients generally share common opportunities for expanding their participation in the value-added chain.

The Bolivia program concentrates on producers of raw fiber — those who make up the largest segment of the subsector, and whose livelihoods depend almost exclusively on animal fiber, meat, and hide production. The goal is to increase both the value of the finished alpaca fiber, and the portion of this larger total value that is captured by ATI's clients.

The illustration on p. 7 charts the dollar level of value added and the physical volume of production for each major stage in the Bolivia alpaca fiber processing chain. The inner figure represents the value chain for alpaca herders, and the degree to which they participated previously. The larger figure outlines the striking improvements in output and value added for ATI's clients when: (1) the interventions now underway achieve full impact; and (2) the contribution of small producers is optimized across all, not just some, of the stages of the alpaca fiber production chain.

Note that the dramatic increases in production volume and value added in the first three stages of the production chain are further enhanced by the expanded participation of small producers in the final two value-adding stages. Final processing facilities owned by the local producers association and direct sales of high value alpaca fiber in the international market will permit ATI's client group to capture the full value of their production. The result? ATI's clients will capture over $200,000 in annual income from fiber production and processing, more than 11 times what they previously earned. This is one measure of the development value of a small producer oriented, integrated multiple intervention approach to a strategic subsector.

Achieving these startling increases in small producer income requires ATI and its local partners to orchestrate more than a dozen discrete technical and commercial process modifications. Some changes are simply and quickly introduced, like the sturdy, high quality shears widely used in neighboring Peru, which increase the quantity of top quality fiber shorn from each alpaca by 25 percent. Some modifications take years to achieve full effect, such as the controlled pen feeding systems and selective alpaca breeding of both local and imported champion animals. Another intervention — the water-recycling, mechanized wool washing plant that alleviates a major bottleneck at step three — requires access to substantial loan capital plus engineering support and procurement assistance. But it will further expand production and increase small producer commercial participation at a critical and lucrative point in the value chain.



DESIGNING SOLUTIONS FOR GLOBAL IMPACT

Crafting solutions to meet the requirements of small producers in strategic subsectors is exacting, complex work, as this case illustrates. The demands are even greater when the goal is not the success of an individual project but the definition of an integrated approach capable of global replication.

To achieve this goal, ATI's programs progress along a carefully structured continuum from design to widespread dissemination (see the small producer development paradigm chart on pages 8-9). In the Exploration Phase, ATI examines the strategic subsectors of major small producer groups. Here ATI assembles a variety of information overlays to complement its own experience. These include data on land use, technology utilization, natural resource constraints, and volume of production. The Design Phase involves development and testing of promising small producer commercial, management, and

operating technology systems to address value-adding opportunities. Here ATI joins with local partners for implementation with at least one large client group. The subsector strategy is then reformulated for broader application with similar client groups in the Expansion Phase, preferably in new geographic or socio-cultural contexts in preparation for adaptation among large numbers of small farmers and entrepreneurs.

The Diffusion Phase represents ATI's ultimate objective: multiple national, regional, or global replications of demonstrated subsector systems for millions of small producers.

Partnerships are critical to success, especially to diffusion of mature programs. ATI now collaborates with partner institutions in more than 20 countries worldwide. In the past, these partnerships were project specific and geographically confined to a given country. ATI's new small producer paradigm expands the concept of collaboration to embrace global partnerships operating in multicultural and multinational environments. ATI acts as a catalyst, identifying and developing relationships with key institutions and individuals worldwide, and as a broker, leveraging technical and financial resources.

These multinational networks evolve into international project teams that share technical expertise, market information, development knowledge, and a thorough understanding of clients' needs. These teams are temporary and created to support and strengthen local institutions, not to replace them. They tap the financial resources of

THE EXPLORATION PHASE

Target Classes of Small Producers

The ATI development process begins with the selection of strategic subsectors based on:

- Numbers of small producers
- Market niches
- Need
- Potential for impact
- Potential role for women and minorities
- Environmental and natural resource impacts
- National and international policy impacts

THE DESIGN PHASE

Analyze and Demonstrate Solutions

- Identify the value-adding steps along the product chain
- Identify subsector participants and conduct stakeholder analysis
- Assess a variety of cost-effective interventions for viability and impact
- Design potential market, technical, social, and economic interventions and evaluate
- Implement or demonstrate a set of interventions in at least one setting
- Evaluate impacts
- Assess the potential for expansion

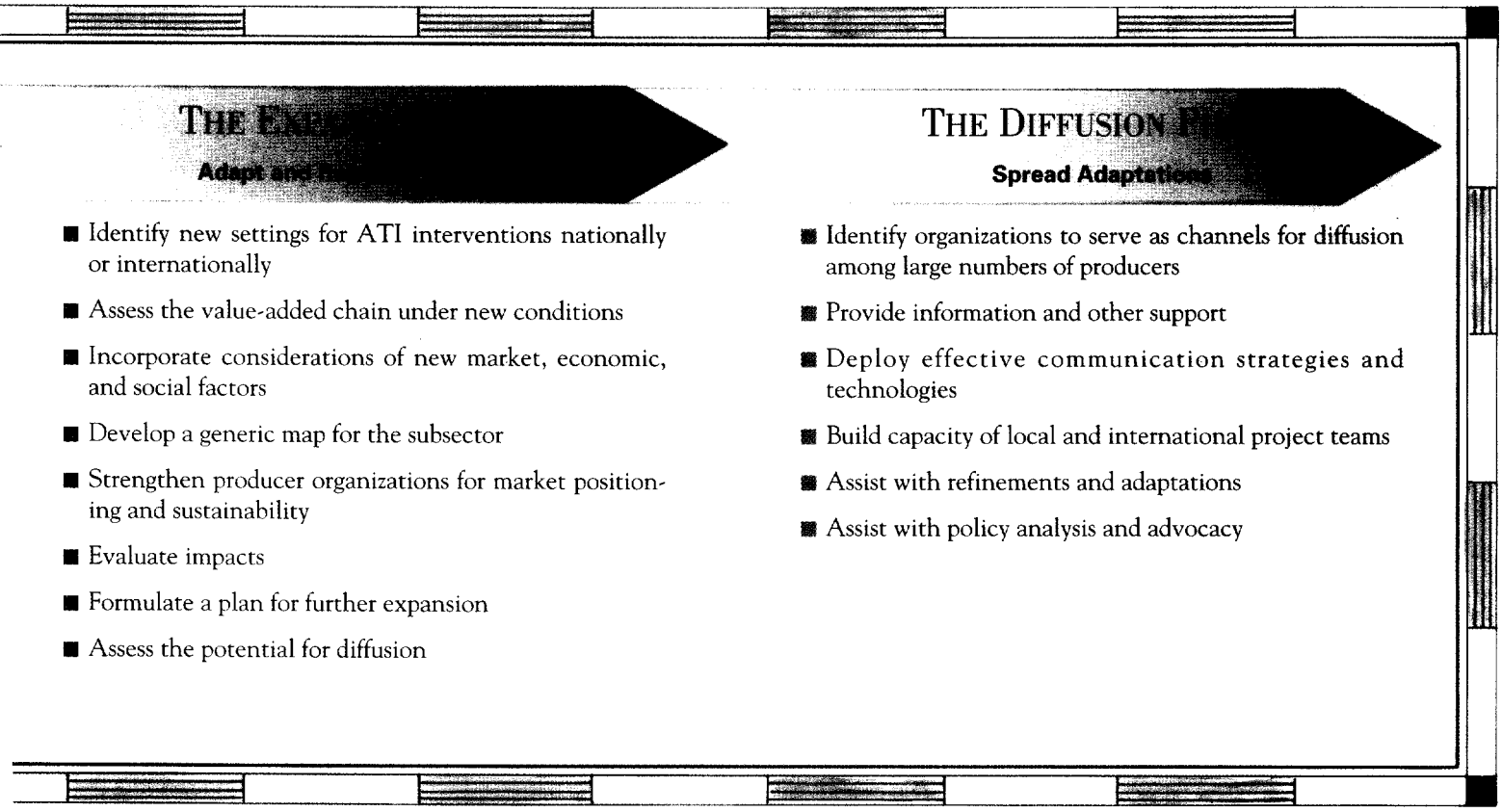
major international development organizations; implement South-South cooperation programs; and leave in place a stronger groundwork for economic growth that taps the potential of small producers.

Even with strong and creative partners, providing adequate technical assistance, training, and operating experience for major classes of small entrepreneurs is not quick, easy, or inexpensive. But such a strategy, addressed to the impediments faced by millions of producers worldwide, offers unusual investment potential for development finance.

BUILDING SUSTAINABLE ECONOMIES FOR THE 21ST CENTURY

Small producers who can themselves recognize and react to the shifting dynamics of regional and international markets have the skills to compete effectively today, and in the future, breaking cycles of poverty and underdevelopment. The soundness of the approach employed by ATI and its partners is increasingly endorsed by indigenous NGOs, U.N. agencies, and an expanding range of international development and environment organizations, as they team up with ATI to serve as staff to small producers.

The bottom line: new global partnerships, tailored to the needs and opportunities of large groups of small producers, can now begin to leverage the resources required to design and implement development programs that are cost-effective and potent, and promise sustainable economies for the 21st century.



Value Added by Highland People

Volcán Sajama keeps watch over the town of Cosapa, where one of two outreach centers serves Bolivian alpaca herders.

The wide-eyed children crowded around the television screen are watching a true story about their own highland communities unfold. For centuries, their families and neighbors have raised sheep in the steep, volcanic pastures of the San Marcos and Cuchumatanes Mountains and turned the wool into garments, rugs, and blankets prized throughout Guatemala and in many parts of the world. The video on display this May Day 1992 holiday weekend at the Momostenango weavers center celebrates this tradition. It also highlights a recent series of value-adding innovations in wool production and processing that is creating a new economy for thousands of shepherds and artisans — and providing a winning model for counterparts in Bolivia and around the globe.

These innovations are at the heart of ATI's partnership with FUNDAP (Foundation for the Integrated Development of Socioeconomic Programs), a non-profit organization founded in 1981. FUNDAP practices *desarrollo con dignidad* — development with dignity — emphasizing market-oriented activities for individuals and communities that have low incomes but potentially valuable products.

FUNDAP's efforts in the wool sector illustrate. Known for a rich variety of intricate and colorful

designs dating from pre-Columbian times, artisanal wool products of Guatemala's northern highlands have long enjoyed a small but significant niche in the retail textile markets of Europe, North America, and Central America. While demand increased somewhat in the early 1980s, supply and product quality were declining — principally because of the lack of local wool of adequate quality and of competitive wool handling and processing technology. Three hundred years of inbreeding had caused the quality of the national flock to deteriorate. Lamb mortality was 50 percent. Veterinary services were non-existent, and sheep nutrition was poor. Shearing occurred too frequently and improperly, and the wool was not adequately classified or cleaned. Many weavers had to walk miles and climb down a steep ravine to wash their finished products in a spring.

In 1986, 1,500 families active in the washing, beating, carding, spinning, dyeing, weaving, and marketing of finished wool products joined with FUNDAP to upgrade their enterprises. It soon became apparent, however, that more of the value-added chain — starting with shepherds, the genetic selection and care and feeding of their flocks, and the management of their pastures — needed to be engaged. ATI and FUNDAP staff tapped the world renowned fiber expertise of the late Ian Fraser (see p. 36) to design and implement a market-driven series of integrated interventions that are yielding increases in income for producers and processors along the entire fiber value chain.

About 25,000 Guatemalan families make their living from wool, and typically it is a meager one. Herd sizes range from 20 to 100 sheep; a herd of 40 brings a family a monthly income of about US$25. The ATI-FUNDAP package of interventions includes: a new breeding schedule and technology, crossing native Criollo sheep with imported Corriedale rams for fiber that is longer, denser, and more consistent in diameter; an animal health care program to control internal parasites; upgrading of pastures with improved forage crops and movable corrals for rotation of grazing patterns; a belt-driven wool drum carder that produces 12 times more good quality fiber per hour; modifications in the hand spinning wheel; a wool laboratory for constant monitoring of wool fiber quality; a new centralized, post-weave washing facility; a weavers' materials bank and credit fund to acquire yarns and dyes; weaving and knitting courses on achieving export quality; design assistance to incorporate traditional indigenous designs into new products or styles; and surveys of national and international markets for the development of strategies and distribution systems.

Two interventions merit special mention: improved shears and fiber classification. ATI and FUNDAP found that shepherds typically used awkward two-handed shears or, worse, jagged-edged tin

Guatemalan women parade in colorful garments characteristic of the highlands, and Bolivian camelid producers take pride in junior champion alpaca "Wari," one of three prize winners at the International Camelid Fair in Peru.

"ATI fills a vital niche in the development community by tapping the economic potential of communities of people who are living under difficult environmental conditions and in remote areas. ATI's value-adding work with alpaca producers in the high plains of Bolivia is an excellent example."

— Daan Everts
Assistant Administrator
United Nations
Development Program

can lids. The introduction of single-hand, spring-loaded shears substantially increased the fiber shepherds obtain from each animal. Classifying and pricing fiber with an eye to the marketplace not only secures new outlets for various gradations; it also provides a built-in incentive for continued quality improvements in production techniques.

Now in its seventh year, the Guatemala wool fiber program is providing shepherds and artisans worldwide with a workable model for greatly enhancing value and income. A close variation on this package of interventions has been transferred to Bolivia, and large portions of it — including improved shears and fiber classification — are clearly replicable with local adaptations around the globe (see map on p. 13). A recent mission to Nepal by ATI's animal fiber project team found that the value chain analysis developed in Guatemala and Bolivia enabled them to begin to respond effectively to local producers seeking to improve quality, increase production capacity, and thus secure more of the revenue generated by Nepal's carpet industry.

ON THE ROAD TO EL ALTO

Proof for the contention that ATI's small producer development paradigm travels well can be found in the Andes. A multi-colored roadside marker at 4,500 meters contrasts sharply with its natural backdrop — a bleak and barely vegetated plain stretching out in all directions. The familiar animal staring out from the directional sign advises visitors to Bolivia's *altiplano* that they are in "camelid country" and approaching *Centro Cosapa*, an outpost of the alpaca fiber program ATI jointly manages with partner AIGACAA, the Integrated Association of Camelid Producers of the High Andes.

In December 1992, ATI completed its first full year as the United Nations executing agency for this five-year alpaca fiber program jointly funded by the U.N. Development Program, the U.N. Capital Development Fund, and ATI. Program co-managers Bill Gschwend (ATI) and Luis Ticona (AIGACAA) bring a wide array of staff skills and management interventions to bear along the value chain. More than 70 foot-powered treadle pumps (used in ATI's work with market gardeners — see p. 25) were installed to protect the animals against the extreme drought experienced on the *altiplano*. Credit was made available for fencing to better manage pasture land, and for the purchase of more than 600 high quality reproduction alpacas to improve the herd's genetic composition. Individual herders and fiber handlers — many of them women — trained in improved farm management, animal husbandry, shearing, sorting, classifying, and weighing technologies. And AIGACAA as an organization prepared itself to better tackle fiber quality control, processing, marketing, and management.

These first-year results point to the program's five-year goals: to increase the incomes of alpaca producers by (1) expanding the annual fiber production of some 48,000 alpacas by 80 percent by the end of the project; and (2) upgrading alpaca fiber processing for a finished product competitive in international markets.

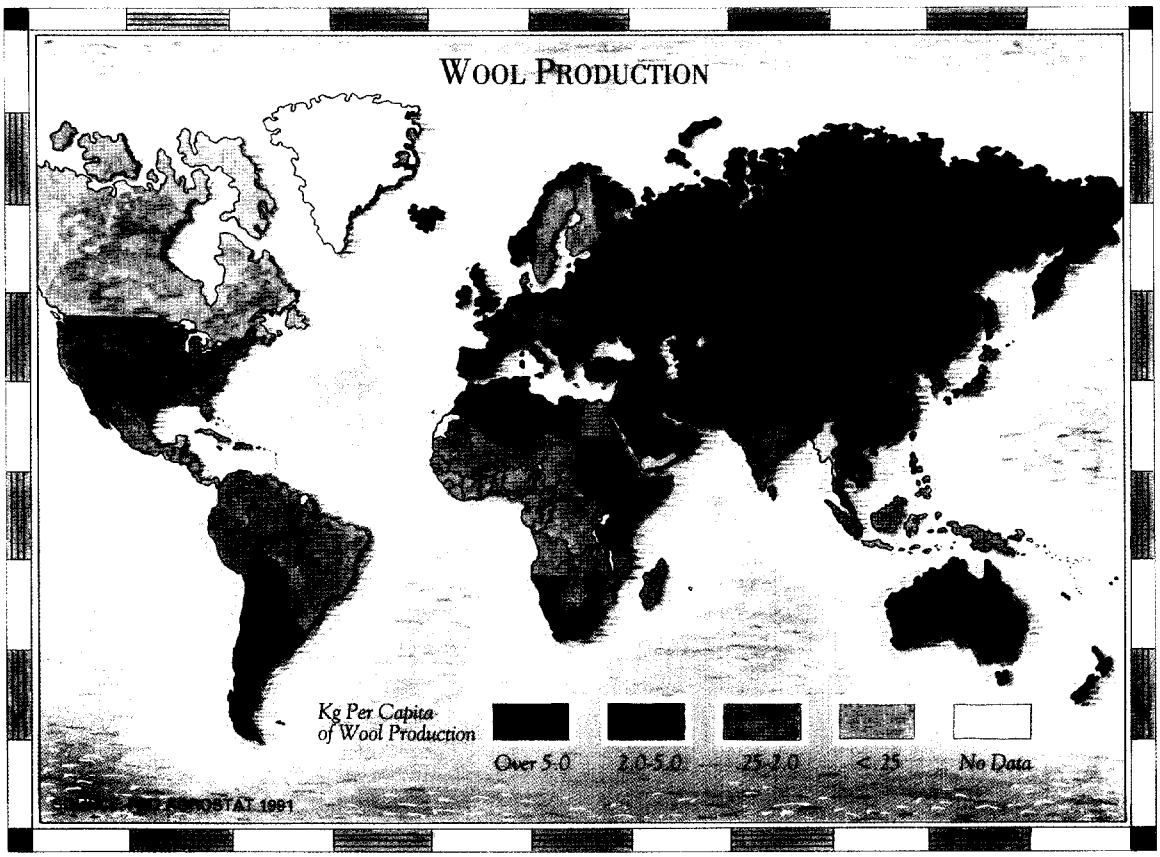
Bolivia's well developed knitting industry in 1991 exported close to 40,000 kilograms of yarns and sweaters — about half its total yarn exports — to the United States. Informal surveys have shown that more commercial knitters would buy Bolivian yarns if their quality was on par with those imported from Peru. International alpaca fiber market studies also reveal very positive prospects, if fiber processing quality goals are met. Taking up the challenge for

these key subsequent segments of the value chain, AIGACAA is building a producer-owned integrated processing plant to upgrade yarn production and expand markets for the local alpaca industry.

AIGACAA is a non-profit organization of 1,000 families. Like the rest of Bolivia's 12,000 camelid producers, AIGACAA's members rely almost exclusively on alpaca production for their economic survival. The average herd size is 30 alpacas, 50 llamas, and 90 sheep; monthly family cash income averages US$32, entirely generated through animal husbandry: fiber, meat, and skins. Alpacas generate the most revenue per head, and their fiber represents the product with the highest potential for increased value.

Two outreach centers, Cosapa and Wariscata, house dormitories, a fiber warehouse, a veterinary lab and office, and a farm materials supply store and office. Twenty-two concrete baths have been built and 37,000 animals from 600 farms treated for external parasites through the project's preventive and curative animal health plan. Training courses, such as one held in the Macay Community in the Oruro Department, teach men and women about animal health and illness prevention. At the community school, Cosapa center staff give talks and demonstrations to the children who care for the animals once their studies are over.

This model of an integrated strategy for quality and productivity improvements across a complex value-added chain — building enterprises that will continue to adapt and grow — holds more promise than much of what passes for development. If success is achieved in Guatemala and Bolivia today and in Nepal and Namibia tomorrow, ATI and its partners contend that the economics of herding animals and processing their fibers can be transformed for producers around the globe.



Work in Guatemala and Bolivia provides a winning model for fiber producers around the globe.

Power to the Processors

In Eastern and Southern Africa, ATI has helped create a new economics for local oilseed processors. This subsector restructuring began in Tanzania and continues to expand most dramatically there, as oilseed value chain transformations create new opportunities in community after community.

For example, a village council near Singida Town decides to go into business so that farmers can bring their sunflower seed and have it pressed into high quality cooking oil, a scarce but vital commodity in many rural areas of Africa. Related entrepreneurial ventures soon follow in the surrounding area. A number of villagers buy improved, oil-rich planting seed from the district Agricultural Department and grow more for sale. Farmers in the area quadruple their sunflower seed production and double their incomes — because of the existence of a dependable market for the seed and the ability to add value to it through processing.

A new, scaled-down oilseed press designed by CAMARTEC's Erwin Protzen is simpler to use and costs roughly US$120, an amount press owners can earn in a few months of pressing.

In villages around Kondoa Town in Tanzania's Dodoma Region, a concentration of new processing operations creates strong competition for seeds. Owners of these new businesses exchange trained laborers or train their neighbors' laborers in the art of oilseed extraction — and many engage in informal, even secretive, contracting arrangements to ensure the supply of the seed. Close to 90 percent of the farmers have switched to improved seed, and labor and land are allocated away from less lucrative cash crops toward sunflower production and processing. Service pressers — initially less willing and able to risk buying a new capital asset — become convinced of the profitability of capturing segments of this market and are now prepared to purchase presses to anchor their own new businesses.

These transformations in the oilseed processing

subsector have been generated by ATI's Tanzania program,[1] where close to 800 entrepreneurs have purchased presses in 550 villages, 7,000 additional service pressers are able to add value to their seed, and some 50,000 farmers have found dependable higher prices for their oilseed crop. As the program expands, it addresses multiple constraints along the value-added chain from production of seed to marketing the oil, increasing the added value small producers are able to capture. It promotes technology innovations, trains local manufacturers, and develops tooling to improve the quality and efficiency of fabrication. And the approach is applicable, with local adaptations, to rural oilseed processors anywhere in the world.

Initially in Tanzania, ATI and its partners approached the market through a classic extension system. The work was subsidized; loans were available below market rates. Now in areas where a nucleus of oil processing businesses exists, demand for the new businesses has increased as entrepreneurs see a reduction of risks over time. To address this growing demand and at the same time build a sustainable commercial mechanism for press purchase and repair, ATI and its partners are now establishing a private marketing system to facilitate the sale in rural areas of presses and other productive technologies. The new mode of operation — market driven and connected up and downstream to all segments of the value chain — has resulted in exponential expansion at all stages of the production, processing, and marketing process. New entrepreneurs are proliferating and small producers across the oilseed sector — seed farmers, equipment manufacturers, owners of oilseed processing and service pressing enterprises, and retail marketers of oil and seedcake — are achieving market strength and greatly enhanced incomes.

In 1991, the U.S. National Center for Appropriate Technology awarded the Tanzania program first prize for sustainable agriculture, and a U.S. National Public Radio report summed it up in just three words: "development...that works." Program Manager Lynn Schlueter and Senior Field Manager Dallas Granima now aim to make the program work for many thousands more across Tanzania. Their 1993 national goal for manufacturers to sell "a press a day" would bring the total to over 1,000 oil press enterprises, with a combined annual production capacity surpassing two millon liters of cooking oil and tons of protein-rich seedcake for animal feed.

JOINING FORCES WITH PARTNERS AND COLLABORATORS

ATI's regional OILS program for East and Southern Africa, launched in 1992, is building alliances to assemble the vast range of skills necessary to transform a subsector on a regional basis. A major program grant from the Office for Operations and New Initiatives of USAID's Africa Bureau is complemented by funding from the International Development Research Center (IDRC) of Canada for OILS research and networking. The British Natural Resources Institute (NRI) provides assistance in testing technologies. The OILS program also carries out its own research in such areas as feasibility assessments and socioeconomic impact studies. Discussions with Southern Africa's Preferential Trade Area (PTA) consortium could lead to com-

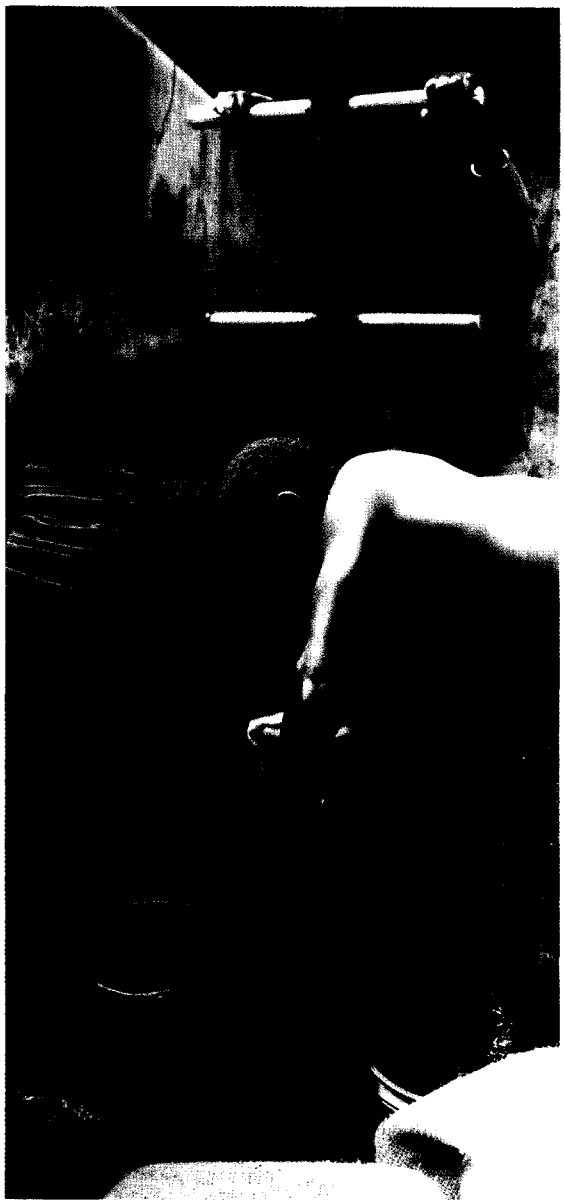
"In 29 years of work in developing countries, I came across this year in Tanzania an NGO project more successful than any other I have seen ... the Village Sunflower Project sponsored by the Evangelical Lutheran Church in Tanzania and Appropriate Technology International."

— John Russell
International Service for National Agricultural Research

[1] ATI's implementation partners in Tanzania are Lutheran World Relief (LWR) and the national Small Industries Development Organization (SIDO) of Tanzania. Funding comes from the US Agency for International Development (AID), LWR, Food Industry Crusade Against Hunger (FICAH), and ATI.

mercial processing activities supported by the participation of 20 national governments. Through a network led by IDRC and PTA, ATI taps expertise on seeds, agronomy, agricultural research, and policy analysis.

The breakthrough technology — the simple, hand-operated ram press ATI engineer Carl Bielenberg invented in the mid-1980s — is undergoing some adaptations in an effort to further address a range of processors and their specific needs. A scaled-down version, easier to operate and priced at just US$120, promises to multiply new business starts. This smaller ram press is primarily the work of a Tanzania-born Swiss engineer, Erwin Protzen, who works at the Center for Agricultural Mechanization and Rural Technology (CAMARTEC), a technology development facility located near the Regional OILS field office in Arusha, Tanzania. With funding from ATI, Protzen and colleague Livinus Manyanga are exploring new possibilities for larger and smaller versions of the press, and they are experimenting with other staple oilseeds such as groundnuts and sesame.



Close to 800 risk-takers across Tanzania are now producing millions of dollars in new rural income each year, while cutting back on costly cooking oil imports.

TROUBLE-SHOOTING IN ZIMBABWE AND UGANDA

The oilseed processors program moved on to Zimbabwe three years ago.[1] The value chain is substantially the same, but application of ATI's development paradigm adapts interventions to conform to different strengths and weaknesses. In Zimbabwe, a superior road and communications infrastructure links new processing entrepreneurs, equipment manufacturers and suppliers upstream in the value chain, and customers downstream. But an under-developed artisanal sector is the principal bottleneck in the production chain, leading to an emphasis on tooling to improve local manufacturing capabilities.

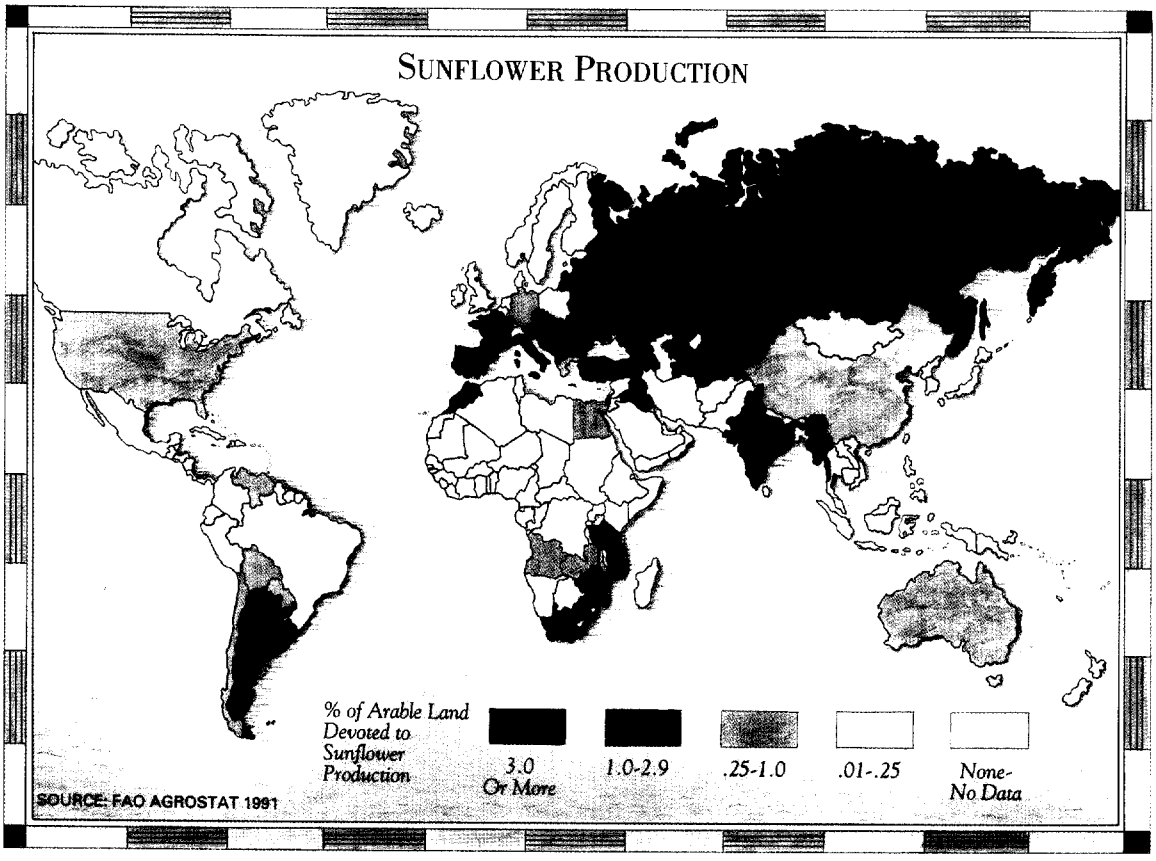
When CAMARTEC's Livinus Manyanga and Jonathan Herz, an American engineer/blacksmith, visited Zimbabwe last November, they found a group of women press owners in their oil pressing shed, working hard. Too hard. The ram press they had bought required considerable physical effort.

The team's on-site diagnosis was that local manufacturers had not followed the design drawings. The remedies prescribed were to re-fit faulty presses with appropriate parts, give more training to several manufacturers, seek new manufacturers able to work at higher levels of quality and throughput, and provide the services of a part-time Zimbabwean consulting engineer to help oversee press manufacturing.

In 1993, ATI sent a multi-disciplinary team to Uganda to provide support to the oilseed processing activities of World Learning, CARE, and a Ugandan NGO, Hands in Service. Here too, manufacturing was found to be the Achilles' heel in the production chain, and training was quickly organized.

The work of building new businesses and transforming subsectors in countries from Uganda to Zimbabwe to the Gambia now depends upon the success of all the participants in each segment of the value-added chain: researchers developing improved seed and farming practices; farmers growing an expanded crop; manufacturers producing adequate supplies of well-made equipment; lenders providing appropriate financial vehicles; processors and service pressers applying commercial standards to their new enterprises; repair shops servicing and rebuilding equipment as needed; and marketers forging the commercial links to buyers of seed, equipment, oil, and seedcake. Already, requests for regional OILS assistance have come in from more than 15 countries. This new industry promises to strengthen economies and generate sustainable livelihoods for hundreds of thousands of families across Africa and in parts of Latin America and Asia as well (see oilseed production map below).

[1] The Zimbabwe program is a joint initiative of several agencies. World University Service of Canada (WUSC) is the direct administrator; Africa Now of London contributes funding and managerial support; and ATI provides both technical and financial resources. Additional funding comes from the Canadian International Development Agency (CIDA) and the Food Industry Crusade Against Hunger (FICAH).



ATI is studying oilseed production worldwide to target countries for its diffusion phase.

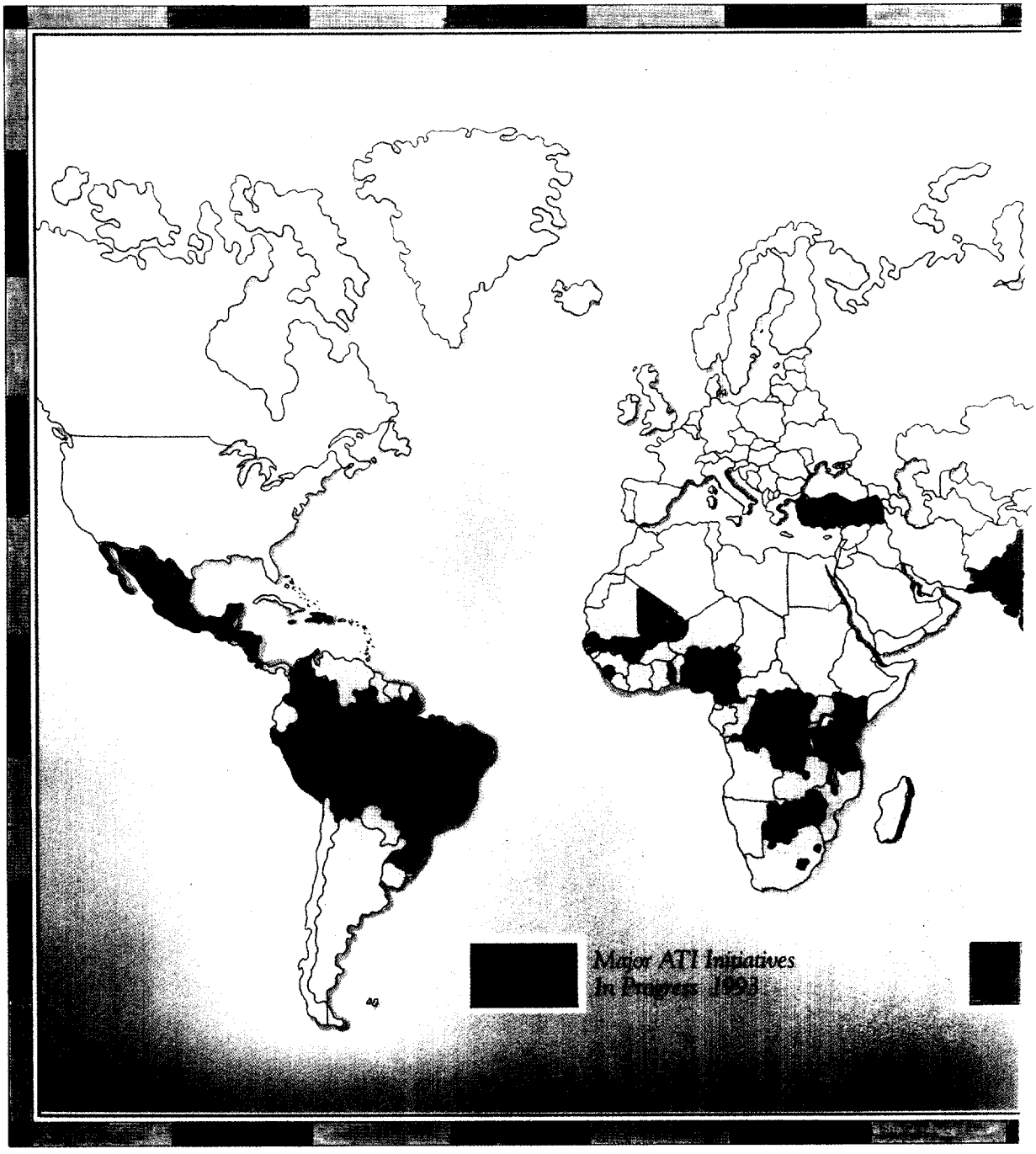
International Project Teams for Global Impact

ANIMAL FIBER PRODUCERS AND PROCESSORS
Bolivia
Guatemala

CERAMICISTS AND METALWORKING ARTISANS
Guatemala
Senegal

FRUIT AND VEGETABLE GARDENERS
Nigeria
Senegal

HERDERS AND DAIRY FARMERS
India



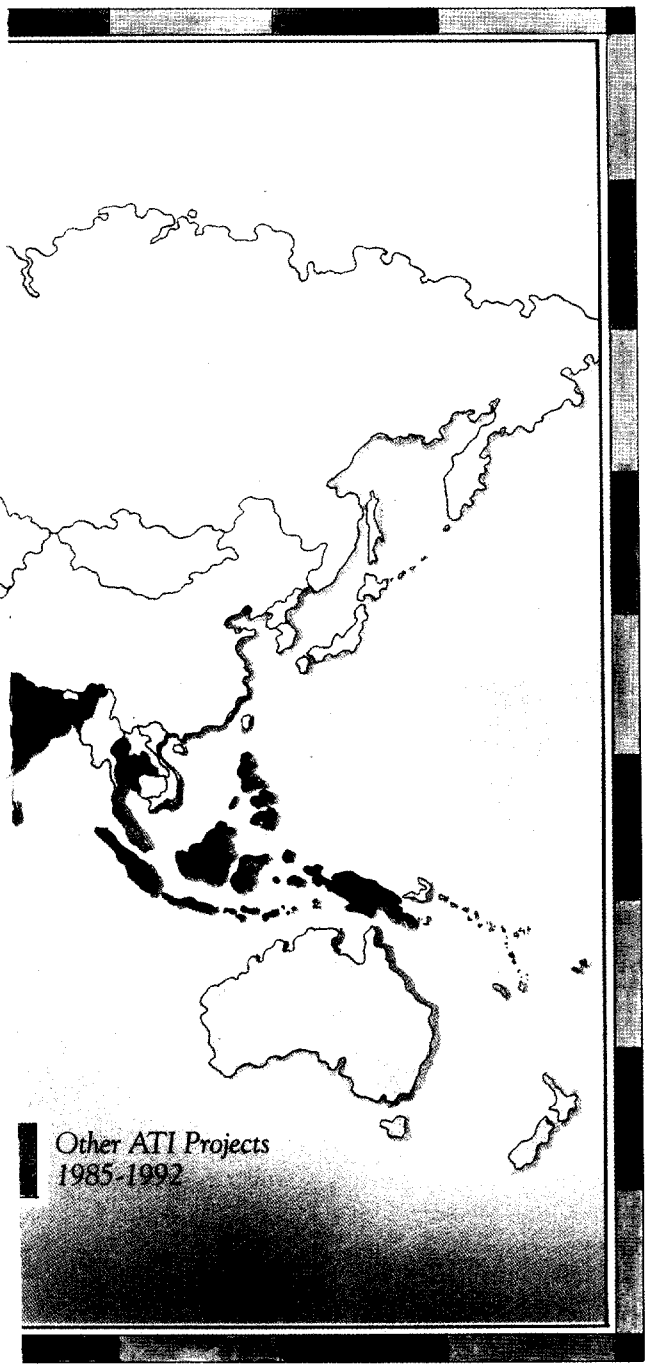
After more than a decade of exploring small producer solutions in over 40 countries, ATI has sharpened its focus on the problems facing eight major classes of small-scale producers. In each strategic subsector, ATI and its partners are transforming the value-added chain in one or more countries, helping small-scale producers to solve production bottlenecks, increase the value of their products, and capture a larger share of the value of finished goods — with potential for replication among millions.

ATI's value-adding transformations of the animal fiber and oilseed subsectors are each well developed in two countries and now subject to further replication on a global scale. A program to increase milk production from dairy cattle while decreasing their methane emissions is getting under way in India as ATI conducts feasibility studies for similar work in Tanzania, Brazil, Bangladesh, and Eastern Europe.

ATI has launched comprehensive programs to increase the productivity and value-adding potential of market gardeners in Senegal and Nigeria, with impetus for widespread activity across West Africa and around the world. Transformative work with coconut farmers in the Philippines and cashew growers in Honduras shows potential for improving the livelihoods of millions of tree crop farmers.

ATI is also beginning to transform the value-added chain for small-scale ceramicists in Guatemala and ceramic and metal stove makers in Senegal. An effluent treatment program for small-scale textile manufacturers in India will help to curtail the massive pollution problems that threaten the growth of the industry.

ATI's applications of biotechnologies for resource-poor farmers in Asia have worldwide implications for farmers who cannot afford capital-intensive technologies.



OILSEED PRODUCERS AND PROCESSORS
Tanzania
Zimbabwe

RESOURCE-POOR FARMERS
Indonesia
Nepal
Thailand

TEXTILE PRODUCERS
India

TREE CROP FARMERS
Honduras
Philippines

The Big Environmental Problems of Small Businesses

Swaths of magenta and saffron sway on bamboo racks, billowing dry in the sun. Sheets of white calico, screen-printed a cheerful red and white, flap in the breeze. These eye-catching displays attest to the skills of master dyers and printers — craftspeople who process cloth in tens of thousands of small enterprises. Across Rajasthan state in northwestern India, rolls of brightly hued fabrics are trucked to market daily for eventual sale around the globe. Unfortunately, the dyes, bleaches, and other chemicals that yield some of the most brilliant contrasts also — in the aggregate — result in large-scale water pollution.

The Government of India estimates that 70 percent of the country's available water is polluted; the Center for Science and Environment in New Delhi claims that the cotton textile industry shoulders its share of the blame by generating an estimated 1.5 billion cubic meters of waste water every year. Pali, one of Rajasthan's leading textile centers, is also one of India's 23 most polluted industrial areas. In Jodhpur, site of an expanding export trade, raw textile wastes are flushed directly into the River Jojri. Villagers living near the discharge point have

Rajasthan state in northwest India is home to tens of thousands of small-scale textile processors — as well as to serious water pollution problems.

reported a steep decline in crop yields, as well as widespread well-water contamination. Some 60 wells which supplied drinking water a decade ago now contain water with a pH level too high for human consumption.

In the 1980s Rajasthan's state government and pollution control board enacted a moratorium on the licensing of new textile units and the provision of financial assistance to existing ones until effective effluent treatment technologies are identified and implemented. Under a 1991 memorandum of understanding with the Small Industries Development Bank of India (SIDBI) — established in 1990 with the specific goal of addressing the financial needs of small producers — ATI joined forces with the U.S.-based engineering firm of Metcalf and Eddy and local textile experts to conduct a feasibility study on low-cost water pollution control methods for small-scale textile units. The study team observed enterprises in four major textile centers, on the lookout for ways to improve manufacturing process efficiencies and identify, test, and disseminate technologies for wastewater treatment.

Based on the recommendations of this study, SIDBI agreed to fund the first biologically-based central treatment facility at Jodhpur at a cost of roughly US$400,000. Once this demonstration facility is operational, SIDBI expects to replicate the technology at 10 to 20 locations in India. Producer associations will also be investing in the pollution control technology, having already imposed a tax on their own activities for this purpose.

ATI will supplement this unusual opportunity to address a sweeping environmental problem with further improvements based on its core value chain approach. In cooperation with the New York-based World Environment Center and its volunteer consultants from the U.S. business community, ATI is assessing other segments of the production system of small-scale textile manufacturers to identify process interventions that will increase productivity even as they reduce the amount of effluent generated.

ATI'S STRATEGY FOR ECO-DEVELOPMENT

India's textile processors are not alone in their predicament. As numbers grow and natural resource strains increase, small farmers and business people are ever bigger factors in pollution, resource depletion, and even global climate change. Unsustainable agricultural practices, deforestation, desertification, loss of biological diversity, air and water pollution, agricultural and industrial wastes, excessive consumption of nonrenewable and depletion of renewable energy supplies, and degradation of common property resources — small businesses contribute to all of these problems; they must also figure in their solutions.

Every ATI global small producer initiative is designed to make major contributions to sustainable development through efficient and sound environmental strategies. And some programs — such as those described in this article and the one to follow — apply transformative technologies across a variety of small producer subsectors and value-added

ATI's livestock feeding program will benefit thousands of small dairies in India — most of them run by women — and reduce methane levels which contribute to global warming.

"ATI has supported programs promoting organic biofertilizers in Thailand, and alternative placer mining technology in the Peruvian highlands to reduce mercury contamination in gold extraction. These are the kinds of programs that we believe deserve more support and replication on a larger scale."

— Bruce Rich
Director,
International Program
Environmental Defense Fund

chains. A strategy paper to guide this evolution and provide collaborators with a context for action, "Breaking New Ground: Eco-Technologies for Sustainable Development," written by Program Economist Eric Hyman, builds on ATI's past experience and current insights to bridge the gap between the rhetoric of sustainable development and its practice:

ATI's strategy reduces negative environmental effects on-site and off-site and helps conserve natural resources for future use by providing small-scale producers with alternative ways to earn livelihoods in a sustainable manner. An increase in the quantity or quality of production, lower production costs, a switch to local processing, expanded employment generated by new, non-polluting technologies, creative small enterprise finance that shares risks — these types of economic benefits are the incentives entrepreneurs need to permanently forego unsustainable activities and adopt new ones.

Poverty is a major cause of environmental degradation and the poor are often among its worst victims. Environmental protection efforts are only likely to be effective if basic human needs are met and local participation is encouraged. On the margin of subsistence, people have little choice about tradeoffs that will affect them in the long term or affect others in the short term. Increasing the productivity of small-scale producers can raise their incomes or save labor time, making it more feasible for environment and natural resource factors to be taken into account in production and consumption decisions.

BUILDING ON KURIEN'S PATH-BREAKING APPROACH

In 1991, the U.S. Environmental Protection Agency (EPA) asked ATI to study molasses-urea blocks (MUBs) as a supplement for ruminant animal feeds to increase yields of milk and meat while reducing methane releases from inefficient digestion. Through the efforts of V. Kurien and the National Dairy Development Board which he heads, and other Indian institutions, small producers in this subsector have benefited from a range of interventions along the value chain. ATI's feasibility work on MUBs found that this intervention boosts the quantity and quality of milk by up to 35 percent even as it reduces the methane animals burp. The effects of such enhanced productivity could be global in scale; EPA has identified methane as one of the two most important greenhouse gases.

Planning for program implementation has brought EPA, a major U.S. private foundation, and a prominent U.S. power company together with leading Indian organizations. They include the National Dairy Development Board itself, the BAIF Development Research Foundation, the National Dairy Research Institute, and the Self-Employed Women's Association — which is likely to play a central role in designing and implementing gender-conscious marketing that maximizes the effectiveness of both women extension agents and women dairy farmers. Additional EPA-funded work in Tanzania, Brazil, and Eastern Europe could soon transform this India-based program into a global initiative.

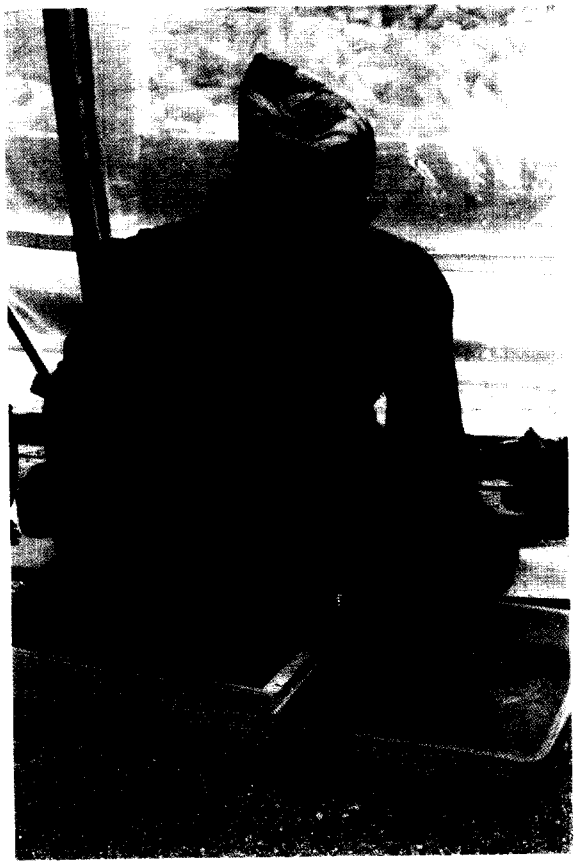
As the program moves to these countries, it will incorporate the value-added interventions that ATI's partners have employed in India during the past two decades. A major opportunity for South-to-South collaboration exists, as these partners become members of an international project team that replicates their experience and learning around the globe.

Sustainable Agriculture for Small Farmers

In March 1992, Kathmandu's Hotel Himalaya was host to an unprecedented gathering — government officials, scientists, academics, farmers, entrepreneurs, and development practitioners from across Asia and around the world. The main attraction: agricultural biotechnologies that help small farmers increase yields and cut back on chemical inputs.

Speakers pointed to progress on biofertilizers, biopesticides, plant tissue culture, and other new technologies in their own countries. On the final day, a trip outside Kathmandu underscored the reality of these "lab to land" advances. The large expanse of potato plants looked unremarkable, but, in fact, it was a harbinger of small-scale agriculture to come. These leafy adult plants — which began life as test-tube seedlings from the International Potato Center in Lima, Peru — produced a 21 percent higher yield than commonly grown varieties planted from "sets" (cut-up tubers). What is more, because they were resistant to late blight disease, they did not require fungicide, compared with the five applications commonly needed for commercial variety potatoes.

Bringing results like these to the fields of millions of resource-poor farmers throughout Asia — and, eventually, to small farmers on other continents as well — is the goal of ATI's Lab to Land Program. This program is joining together researchers, government agencies, non-governmental organizations, and small farmers themselves in nine Asian nations[1] through ANSAB, the Asia Network for Small-Scale Agricultural Biotechnologies. Headquartered in Kathmandu, ANSAB defines the Program's agenda by identify-



Tissue culture propagation practices — shown here at Botanical Enterprises in Lalitpur, Nepal — have increased potato yields by more than 20 percent without a single application of fungicides.

[1] Bangladesh, China, India, Indonesia, Nepal, the Philippines, Sri Lanka, Thailand, and Vietnam.

Bringing results to the fields of millions of resource-poor farmers is the long-term goal of ATI's Lab to Land Program.

ing promising technologies and organizations for technology application projects, and communicating successful biotechnology transfer experiences to farmers. The Network establishes new enterprises, conducts evaluations, and fosters a conducive policy environment.

Dr. Gyan Lal Shrestha, an expert on rice cultivation, is ANSAB's coordinator. ATI's local project partner, New Era, a non-profit, private development organization, is one of ANSAB's founding members; international collaborators include the Free University of Amsterdam and the AID-funded NifTAL nitrogen fixation project in Hawaii. Women farmers and entrepreneurs like Dr. Prabha Pradhan, director of Botanical Enterprises in Lalitpur, Nepal, are integral to the network and its activities. A grant from the Women in Development office of AID's Research and Development Bureau will help introduce potato tissue culture to women farmers in Indonesia.

ROCKEFELLER GRANT SUPPORTS KAPOK TREE PROGRAM

In 1992, ANSAB was awarded a grant by the Global Environmental Program of the Rockefeller Foundation for a feasibility assessment and technology application project for commercial micropropagation of the kapok tree to benefit farmers and aid land reclamation efforts in hilly, degraded regions of Java and other Indonesian islands.

The kapok tree produces pods containing a fiber prized for its buoyancy and water repellency, and exported for use as filler in life preservers and mattresses. Micropropagation using tissue culture offers important advantages, including the ability to test and multiply varieties rapidly, and enables the trees to bear pods at an earlier age. ANSAB is working with Bina Swadaya, an Indonesian NGO, and also a founding member of the network, which has taken responsibility for managing field demonstrations.

ATI is also providing technical assistance and fundraising support to ANSAB to foster widespread commercialization of other proven biotechnology applications, such as blue-green algae fertilizer for rice cultivation in Thailand, Bangladesh, and Indonesia, rhizobium inoculant in India, Sri Lanka, and Vietnam, and biopesticides and mushroom cultivation in Bangladesh, India, and Nepal.

CHAIN REACTION

Designing Solutions to Transform Economies

Technologies like a foot-powered water pump or an improved, portable copra dryer have consistently drawn attention to ATI's work. But experience in the field proves that each of these interventions holds long-term promise only because it is part of a systematic approach to a producer group's value-added chain. Quality and productivity enhancing improvements throughout the production and processing stages are mutually reinforcing and provide a model for similar systems around the world.

ATI has a number of promising solutions to small producer problems currently under design and development. Each reflects an integrated approach to strengthening the production chain, and each holds potential for regional or global diffusion. Hard technologies like the treadle pump and the copra dryer are supported by a range of complementary hard and soft technologies designed to magnify the role of small-scale producers in their respective subsectors.

FROM IRRIGATION TO POST-HARVEST PROCESSING

Hundreds of thousands of small farmers in West Africa earn their incomes by raising fruits and vegetables to take to market. As incomes rise across the Sahel and along the coast, diets are diversifying, increasing demand for domestic horticultural crops. Market gardeners are anxious to increase their harvests, but first they must address a variety of constraints. ATI and its partners provide staff support to enhance the value-adding potential of these small

As diets diversify in many developing countries, market gardeners seek to break down production barriers to meet the demand for valuable produce.

"ATI's wealth-producing strategy is precisely what development is supposed to be about. With ATI behind them, the poor work their own way to prosperity."

— John Maxwell Hamilton
Dean,
Louisiana State University

producers across the value chain — from planting and irrigation to processing, storage, and marketing.

ATI began by introducing the treadle pump, addressing the significant bottleneck caused by the lack or inefficient delivery of water. This locally produced, foot-operated pump allows farmers to secure the water they need to work more land and boost their incomes without depending on costly motorized pumps.

Working with USAID in Mali and Senegal and local partners in several countries, ATI assembles teams of artisans and marketing agents to manufacture and disseminate the treadle pump on a private sector basis. ATI engineer Carl Bielenberg has designed jigs and fixtures that allow for production of interchangeable parts for manufacturing and repair. As a result, more than 700 farmers in five countries have purchased treadle pumps from local artisans.

In Senegal, the teams produce, market, and install the equipment, and provide maintenance services to over 440 market gardeners now expanding their production. Farmers report reallocating labor to allow substantial increases in land use and intensity of production.

More than just a technology program, ATI's work with market gardeners solves production problems across the value-added chain. Input improvements focus not only on irrigation, but on seedling quality, fertilizer, and pesticides. In Senegal for example, ATI developed a wrapped filter technology that improves the recharge rate of existing hand-dug wells. The program is researching improved seedlings for earlier harvesting, as well as biofertilizers and biopesticides, which promise to reduce the need for expensive imported inputs.

Further along the value chain, ATI is exploring production barriers associated with processing, storage, marketing, and exporting. Interventions at these stages promise to capture a greater share of the product value for small farmers and to relieve the revenue losses associated with seasonal oversupply.

Skills and resources emanate from such program partners as the World Bank-funded Sokoto Agricultural and Rural Development Authority in Nigeria, which provides a network of extension agents in close contact with thousands of farmers. NGOs, like Mali's Association for the Study of Applied Technology (AETA), supply important knowledge of local manufacturing capabilities. The National Agricultural Extension and Research Liaison Service, a research institute affiliated with a Nigerian university, provides television and radio support for publicizing the program.

ATI's productivity improvements have also been introduced in Togo by CARE and in Niger by the Peace Corps. In each of these countries and in many other parts of the world, market gardeners face similar bottlenecks to increased land use and crop yields.

ADDING VALUE TO TREE CROPS

Filipino coconut growers greeted an improved copra dryer with uncertainty. The Los Baños multi-crop dryer was less tedious to use than traditional coconut kilns, in which the fire demands frequent tending. But was it worth the investment? The winning argument came not from farmers or project partners but from copra buyers, who offered to pay a premium of 10 to 40 percent for the higher quality copra.

The value-added chain for coconut production is similar to that of millions of tree crop farmers in every part of the world. The process involves land preparation and preservation, tree planting and

care, harvesting, processing, and marketing of intermediate and finished products.

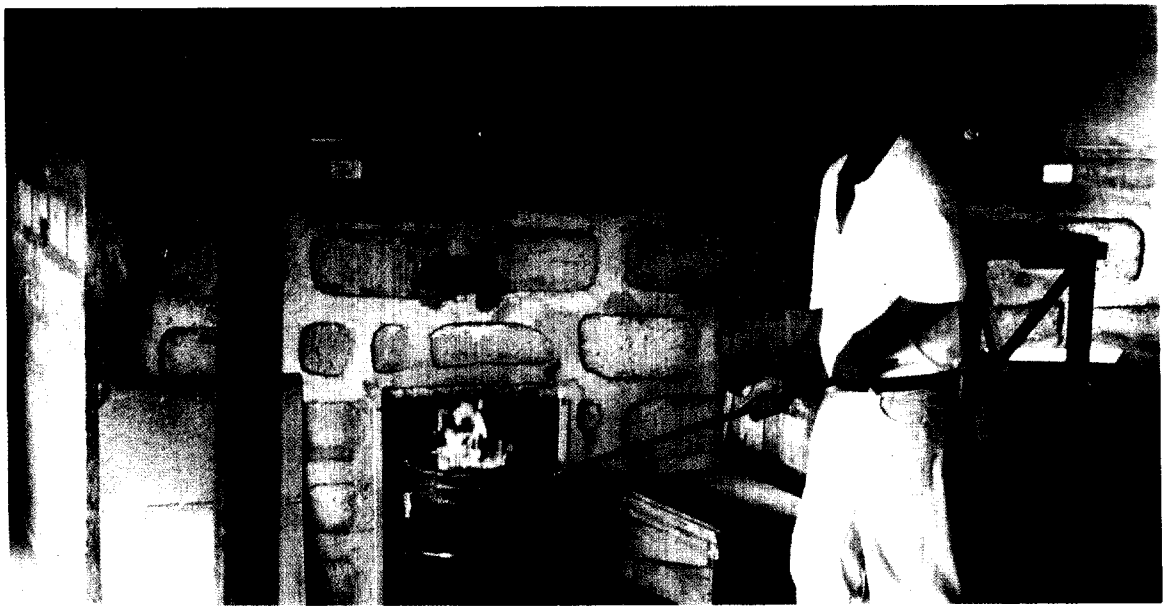
With the financial support of USAID/Philippines and the Royal Tropical Institute of the Netherlands, an ATI partnership has introduced an array of value-adding interventions for small-scale Filipino coconut farmers. The team includes the Philippine Coconut Authority, the Industrial Technology Development Institute, provincial-based NGOs, and the University of the Philippines at Los Baños. This partnership has built a coconut processing plant and training center where small producers learn the integrated operational and business skills they need to put their own newly processed goods into broader local and international markets at competitive prices.

At the early processing stage, farmers are adapting the improved copra dryer, developed at the University at Los Baños. Farmers can command higher prices for the improved copra or continue to add value through additional processing steps. These include milling and oil production and the small-scale manufacture of food items and other products.

The program also enhances the ability of small landholders to market intermediate and finished products. Program partners provide market information, training for ongoing market research, and working capital credit if necessary. Technology and marketing studies have identified dozens of coconut-derived products — including such non-traditional items as coco brittle, cheese, and yogurt — whose markets are accessible to small producers processing anywhere from 25 to 5,000 coconuts a day.

Like market gardeners, tree crop farmers span a vast array of climates and languages on several continents. International project teams led by ATI are exploring the similar production chains of palm oil producers in Africa and cashew and coffee growers in Latin America.

Small-scale tree crop farmers throughout these regions share common barriers to production and a common need for hard and soft technical and commercial skills. They also share the talent and entrepreneurial spirit to tap their resources and transcend economic barriers, given a modest amount of staff support. ATI's expanding international partnerships strengthen their inherent skills, and transform lives, communities, and economies, setting a pattern for neighbors around the world.



Improved coconut drying techniques developed at the University of the Philippines at Los Baños drastically improve the quality and value of small producers' output.

THE ATI TEAM

International Staff for Small Producers

A textile worker in India and a sheep farmer in Guatemala may not know that they have something in common — the commitment of a diverse and talented staff. Offices in La Paz, Dakar, Arusha, and Manila are supported by a core support team in Washington. Communicating in over a dozen languages, ATI staff works with large and small organizations around the globe to build international project teams that identify and serve the needs of small producers.

Bill Watson
Special Assistant
Andrew Maguire
President
Pam Magasich
Executive Assistant

Toni Wright
Executive Assistant
Ken Locklin
Director, Environmental Investment and Business Development
Valeria Budinich
Vice President
Eric Hyman
Evaluation Economist

Carlos R. Lola
Program Development Director, Latin America
Gilberto Amaya
Senior Program Development Officer
Richard Bowman
Senior Program Development Officer
Sandra Rowland
Program Development Officer

Bolivia Project Managers (second and third from left) **Luis Ticona** (AIGACAA) and **Bill Gschwend** (ATI) and other AIGACAA representatives

S.K. Gupta
Director, Financial and Institutional Systems
Sharmila Ribeiro
Program Development Officer
John Ferchak
Agricultural Biologist

Dieter Fischer
Program Development Officer
Ed Perry
Senegal Project Manager
Jeanne Downing
Program Development Director, Africa
Jonathan Otto
Senior Program Development Officer
Jean-Jules Botomogno
Program Development Officer

ATI Manila staff **Lito Lim** and **Recto Dizon**

Asia biotech network coordinator **Gyan Lal Shrestha**

Gordon Johnson
Information Specialist
Jack Croucher
Program Development Director, Asia
Tim Robertson
Consultant
Ann Koontz
Program Development Officer

Peter Ronayne
Executive Assistant
Mary Prather
Office Assistant
Ada Downing
Operations Officer
Joyce Franklin
Administrative Assistant

Lisa Stosch
Program Management Coordinator
José Gemeil
Administrative Assistant
Audrey Gowen
Consultant
Steve Romanoff
Program Advisor

Gwen Wilson
Accountant
Winifred Hill
Director, Finance & Administration
Lystia Santosa
Budget & Accounting Manager
Pat Cutler
Accountant

Staff engineer **Carl Bielenberg** working with machinists in Tanzania

Susan Willis
Executive Secretary
Susan Drake Swift
Director, Institutional Relations and Communications
Sabra Breslin
Technical Information Officer
Katherine Thuermer
Communications Officer

Dallas Granima, Senior Field Manager, Tanzania

Mark Sullivan
Communications Officer
Charvette Shirk
Administrative Assistant
George Bednar
Grants Accountant
Sharron Latimer
Receptionist

Keeping an Eye on the Future

With a resolute vision of ATI's leadership role, Trustees and Council Members remind supporters and staff of the perils — and possibilities — of their mission.

ATI Board of Trustees

William Drayton, Chairman. William Drayton is President of Ashoka: Innovators for the Public. ATI's Chairman since 1989, Drayton also chairs Environmental Safety. A MacArthur Fellow, he taught at Harvard and Stanford, was a management consultant with McKinsey and Company, and served as an Assistant Administrator of the U.S. Environmental Protection Agency.

Doug Bennet. Doug Bennet has served for 10 years as President of National Public Radio. He has held major administrative positions with foundations and the federal government, including two years as head of the U.S. Agency for International Development.

Hon. Walter C. Carrington. A former U.S. Ambassador to Senegal, Walter C. Carrington has lectured on foreign policy and actively pursues efforts to promote democracy in Africa, most recently monitoring elections in Zambia with former President Jimmy Carter.

Hazel Henderson. Hazel Henderson lectures and consults on economics and alternative development strategies in the U.S. and abroad. Her articles have appeared in over 300 U.S. and international journals; her latest book is *Paradigms in Progress.*

Leobardo Jiménez Sánchez. Leobardo Jiménez Sánchez is a Research Professor at the Graduate College at Monticello-Chapingo in Mexico. He has written extensively on agriculture and rural development, focusing on strategies to transfer production technology to small rural producers.

Sandra Kabir. Sandra Kabir is the Executive Director of the Bangladesh Women's Health Coalition, which she founded in 1980. On a leave of absence in Tunisia, Kabir is now serving as Director of the international secretariat of El Taller, undertaking educational activities for NGOs worldwide.

Michael Phillips. Michael Phillips is a business consultant, radio show host, author, and founder of the Briarpatch Network of over 700 small businesses. A former Vice President of the Bank of California, Phillips was a key organizer of the Mastercharge credit card system.

The trustees of ATI include (from left) Leobardo Jiménez Sánchez, Margaret C. Snyder, Michael Phillips, Hazel Henderson, Walter C. Carrington, and Chairman William Drayton. Not pictured are recently elected trustees Doug Bennet and Sandra Kabir.

Margaret C. Snyder. Margaret C. Snyder was a founding director of UNIFEM, the United Nations Development Fund for Women. A writer and lecturer on women and development in Africa, she is currently a Visiting Fellow at Princeton University's Woodrow Wilson School of Public Affairs.

ATI Council

Milton Barnett. Milton Barnett has been Professor of Development Sociology and Asian Studies at Cornell University since 1973. His extensive writings examine traditional farming systems in their socioeconomic contexts and the impact of external forces.

Ela Bhatt. Ela Bhatt is Chairman of the Board of Women's World Banking, which provides access to banking services for low-income women. Bhatt, who founded the Self-Employed Women's Association in India in 1972, has served in India's Upper House of Parliament.

Hon. Paul Bomani. Paul Bomani, former Finance Minister of Tanzania and head of the central bank, held a variety of key ministerial portfolios over 20 years. Bomani has served as Tanzania's Ambassador to the United States and presently serves as advisor to the President.

Hon. David E. Bonior. David E. Bonior is Majority Whip of the U.S. House of Representatives, where he has represented Michigan's 10th District since 1977. He is an outspoken advocate of humanitarian foreign assistance and sound environmental policies at home and abroad.

Margaret Catley-Carlson. Margaret Catley-Carlson is President of the Population Council, applying science and technology to population problems in developing countries. She has served as Deputy Minister, Health and Welfare, Canada, and President of the Canadian International Development Agency.

Richard Cavanagh. Richard Cavanagh is Executive Dean of Harvard University's Kennedy School of Government. A widely-quoted authority on management, Cavanagh's teaching and research focus on public policy, entrepreneurship, and international competitiveness.

Hon. Edward Derwinski. After four years as Secretary of the U.S. Department of Veterans Affairs, Edward Derwinski became a Visiting Fellow at the Heritage Foundation. A former member of Congress, he was senior minority member of the House Foreign Affairs Committee and then Counsellor at the State Department.

Peggy Dulany. Peggy Dulany is President of the Synergos Institute, which she founded in 1986. She was Senior Vice President for Education and Youth Employment at New York City Partnership, and has consulted on women's health issues in the U.S., Portugal, and Brazil.

Michael P. Greene. Michael P. Greene is Indonesia Program Director of the National Academy of Science's Board on Science and Technology for International Development. His work on technology and development follows an academic career in theoretical solid state physics.

Edgar C. Harrell. After holding senior posts with the U.S. State Department and the Agency for International Development, Edgar C. Harrell became President of International Technology Management & Finance. He is currently employed as Operations Director, International Privatization Group, Price Waterhouse.

W. David Hopper. An agricultural economist, W. David Hopper served as President of Canada's International Development Research Center and Senior Vice President of the World Bank. He is now Senior Vice President of Haldor Topsoe, Inc., an international energy and environmental technology company.

Saburo Kawai. Saburo Kawai is Chairman of the International Development Center of Japan and Senior Managing Director of Kezai Doyukai, one of Japan's largest associations of corporate executives. Kawai also serves as President of the Sasakawa Peace Foundation.

M. Peter McPherson. M. Peter McPherson is group Executive Vice President of Bank of America. He has served as Deputy Secretary of the U.S. Treasury Department and Administrator of the Agency for International Development.

Esther Ocloo. The first indigenous Ghanaian to start a food processing industry, Esther Ocloo has spent 50 years training women and low-income people to produce and process food. She was a founder and the first Chairman of the Board of Women's World Banking.

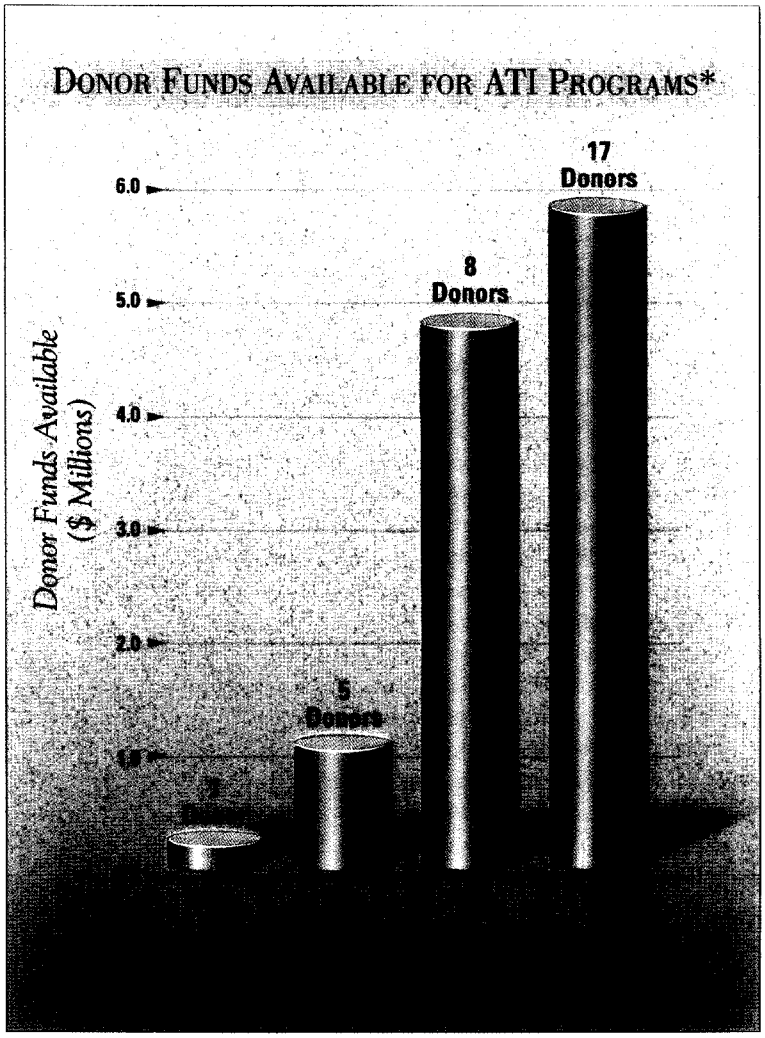
Hon. Emil Salim. Emil Salim recently stepped down as Minister for Population and the Environment in Indonesia. He is a leading spokesperson for developing countries on matters concerning international development and environmental conservation.

Hon. Claudine Schneider. Claudine Schneider is President of the Artemis Project, a research initiative assessing the economic and scientific value of biological diversity resources in the U.S. A former U.S. Representative from Rhode Island, she championed economic incentives for environmental quality.

Hon. Motoo Shiina. Motoo Shiina is an elected Member of the House of Councillors, the upper house of Japan's legislature. Formerly a Member of the Diet, Shiina has been a leader in the Liberal Democratic Party on matters of national security, foreign affairs, and science and technology.

Investing in Development that Works

In support of its small producer development strategy, ATI mobilizes the resources and skills of numerous partner organizations around the world. Many of them are featured throughout the pages of this annual report. The Board and staff of Appropriate Technology International are grateful to the following institutions which have provided financial support for ATI's international programs.



Foremost is the Congress of the United States, which established ATI as a federally-funded, nonprofit organization in 1976. ATI receives core funding through a Cooperative Agreement with the United States Agency for International Development. USAID missions and offices listed below have provided additional program funding, as well as partnership and guidance in the field.

During the past three years, an additional grant from the U.S. Congress has enabled ATI to leverage the financial resources of other NGOs, foundations, development banks, and bilateral and multilateral foreign assistance programs. At the beginning of 1992, ATI's programs were supported by nearly $5 million in commitments from eight donor organizations, above and beyond core funding from USAID. These donor commitments funded 54 percent of ATI's total program activity during the year, as compared to 28 percent in 1990. ATI began 1993 with close to $6 million in donor funding available from 17 donors; this funding is expected to account for 55 percent of program activities during the year.

AFRICA NOW,
UNITED KINGDOM

CANADIAN INTERNATIONAL
DEVELOPMENT AGENCY (CIDA)

DEVELOPMENT ASSISTANCE
FOUNDATION OF SPAIN, (CODESPA)

ENTERPRISE EXTENSION CENTER
(EEC), JAMAICA

FOOD INDUSTRY CRUSADE
AGAINST HUNGER (FICAH), USA

FORD FOUNDATION, USA

FOUNDATION FOR THE INTEGRATED
DEVELOPMENT OF SOCIOECONOMIC
PROGRAMS (FUNDAP), GUATEMALA

INTERNATIONAL DEVELOPMENT
RESEARCH CENTER (IDRC), CANADA

INTERNATIONAL FUND FOR AGRICULTURAL
DEVELOPMENT (IFAD)

LUTHERAN WORLD RELIEF (LWR), USA

NATIONAL AGRICULTURAL EXTENSION
AND RESEARCH LIAISON SERVICES
(NAERLS), NIGERIA

P.T. BAHANA USAHA (PTB),
INDONESIA

ROCKEFELLER FOUNDATION, USA

ROYAL TROPICAL INSTITUTE (KIT),
NETHERLANDS

SMALL INDUSTRIES DEVELOPMENT
BANK OF INDIA (SIDBI)

SOKOTO AGRICULTURAL AND
RURAL DEVELOPMENT AUTHORITY
(SARDA), NIGERIA

UNITED NATIONS CAPITAL
DEVELOPMENT FUND (UNCDF)

UNITED NATIONS CENTER FOR HUMAN
SETTLEMENTS (UN HABITAT)

UNITED NATIONS DEVELOPMENT
FUND FOR WOMEN (UNIFEM)

UNITED NATIONS DEVELOPMENT
PROGRAM (UNDP)

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY (EPA)

USAID AFRICA BUREAU,
OFFICE OF OPERATIONS AND NEW
INITIATIVES (AID/AFR/ONI)

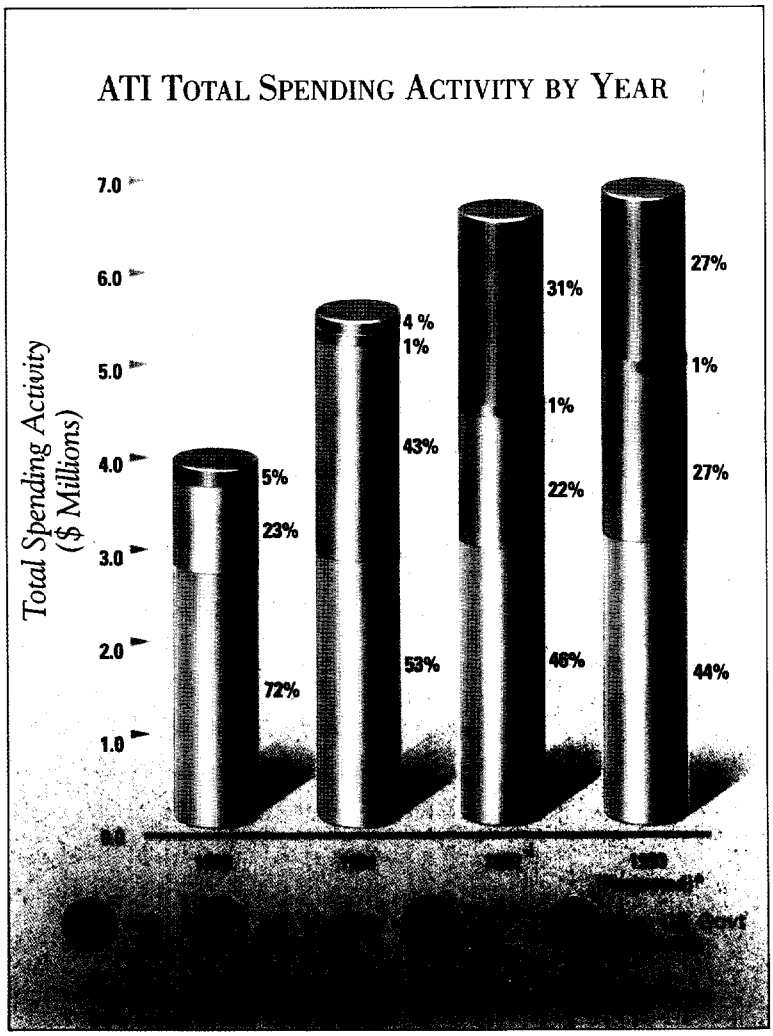
USAID OFFICE OF WOMEN IN
DEVELOPMENT (AID/R&D/WID)

USAID/HONDURAS

USAID/MALI

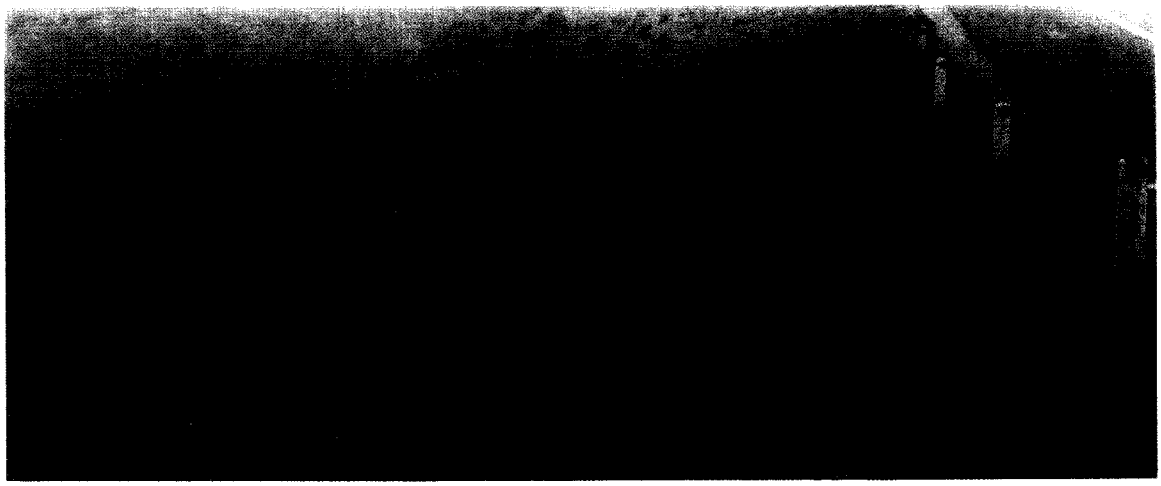
USAID/PHILIPPINES

USAID/SENEGAL



IN MEMORIAM

Ian E.B. Fraser
1926-1992



"People and their cultures perish in isolation,
but they are born or reborn in contact with other men and women,
with men and women of another culture, another creed, another race.
If we do not recognize our humanity in others,
we shall not recognize it in ourselves."

These words of Carlos Fuentes are recalled in memory of Ian Fraser. A New Zealand citizen, he shared his systematic approach to wool production, classification, and marketing with ATI and with thousands of herders and artisans in the highlands of Guatemala and Bolivia. A top authority in his field, Ian might have chosen a more comfortable existence in the economic mainstream. To our everlasting benefit, he did not.