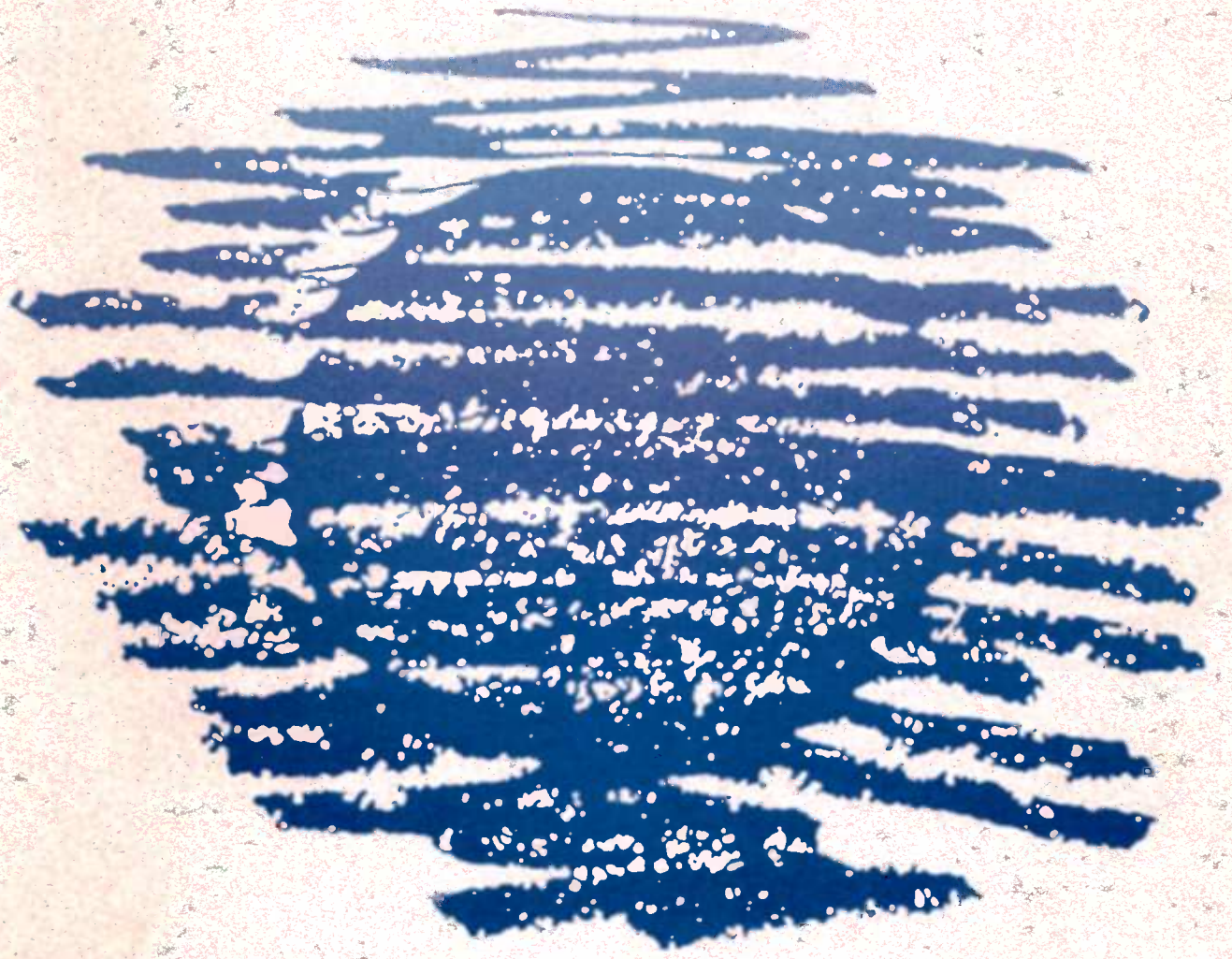
Catalogue of the First IDRC Development Technology Fair Ottawa, Canada

OCTOBER
1-9-9-0



20 IDRC CANADA
YEARS
OF DEVELOPMENT
THROUGH RESEARCH

IDRC

Through support for research, Canada's International Development Research Centre (IDRC) assists developing countries in creating their own long-term solutions to pressing development problems. Support is given directly to Third World institutions whose research focuses primarily on meeting the basic needs of the population and overcoming the problems of poverty. Research is undertaken by Third World recipients independently or, occasionally, in collaboration with Canadian partners.

The principles guiding IDRC-supported research are that projects must be targeted to benefit the poor. Support is usually provided to applied rather than basic research. Projects are designed to maximize the use of local materials and to strengthen human and institutional capacity.

IDRC is funded by the Canadian government, but it is autonomous in its policies and activities. Its Board of Governors is international and reflects the non-partisan, multicultural nature of the organization.

Since its creation in 1970, the Centre has supported some 4,000 projects in more than 100 countries. It contributes to various South-South and South-North research networks, development newsletters, international seminars, and conferences.

The Centre's interests are necessarily extensive to meet the needs of its Third World partners and include agriculture; forestry; fisheries; animal sciences; food storage, processing, and distribution; health systems; education; population studies; economics; urban policies; environmental strategies; science and technology policy; information systems; earth sciences; communication processes; and dissemination and utilization of research results.

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20 YEARS
OF DEVELOPMENT
THROUGH RESEARCH

Contents

Introduction

One of the characteristics of Canada's Official Development Assistance program is its important support to nongovernmental organizations. NGOs, through their own initiatives, are experts in supporting community-level activities. With the funds they raise on their own, and the matching funds from the government, Canadian volunteer organizations are making a major contribution in people-to-people collaboration.

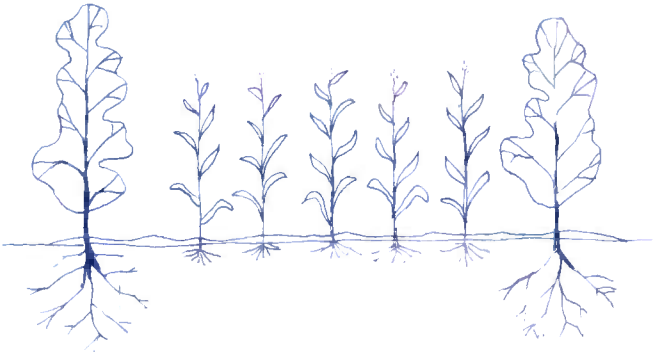
Another unique feature of Canada's ODA is its support to the thinkers, innovators, and scientists of the South. It was 20 years ago that Canada took this bold step, created IDRC, and started investing directly into the developing countries' most precious human resources.

With this **First IDRC Development Technology Fair**, the International Development Research Centre would like to give an opportunity for experts in development to meet with the South's own experts in bringing the benefits of science and technology closer to people.

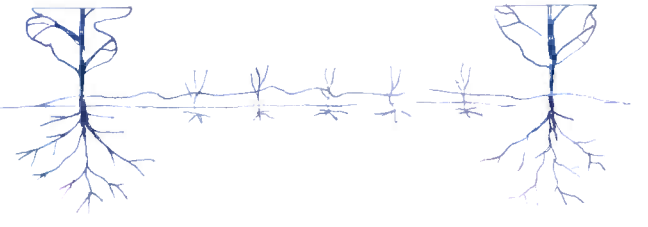
We hope this encounter will truly benefit both groups. If it can help sustain a dialogue that has already started in several countries we will feel it was one sensible way of celebrating our 20th Anniversary.

David Nostbakken
Director
Communications Division
IDRC

Alley Farming Network for Tropical Africa



A.



B.

A. Alley cropping: rows of corn grow between alleys of fast-growing trees.
B. The leaves and the branches of shrubs are collected and spread regularly on the ground to fertilize it and help conserve its humidity.

Alley Farming Network for Tropical Africa

Description:

Alley farming is a sustainable farming system that could replace shifting cultivation systems in tropical Africa while reducing deforestation and land degradation. It exploits the potential of trees, primarily for maintenance of soil fertility and, consequently, for improving crop and livestock production.

Multipurpose trees (usually leguminous) are established in rows 4–6 metres apart with crops cultivated in the "alleys" between the tree rows. Trees are pruned at the end of the first year and subsequently managed through periodic pruning of the regrowth so that interplanted food crops do not suffer from shade.

Tree prunings may be applied to the soil surface as mulch or incorporated as green manure. A significant amount of nitrogen and organic matter is thus made available to the topsoil improving soil fertility. Pruning can also be used for livestock feed leading to improved productivity of sheep and goats. The system can produce wood (fuelwood or poles) and control problem weeds as well.

Organization:

Established in February 1989, the **Alley Farming Network for Tropical Africa** (AFNETA) promotes and supports alley farming research, on-farm testing, and extension of the concept across diverse environments in tropical Africa.

Dissemination:

AFNETA's activities include: information, dissemination, and exchange on alley farming techniques; training; and collaborative research with national agricultural research centres and international agricultural research centres.

Countries covered: Benin, Burkina-Faso, Burundi, Cameroon, Côte d'Ivoire, Ethiopia, Ghana, Kenya, Liberia, Madagascar, Malawi, Mali, Nigeria, Rwanda, Sénégal, Sierra Leone, Tanzania, Togo, Uganda, Zaïre, Zambia, Zimbabwe.

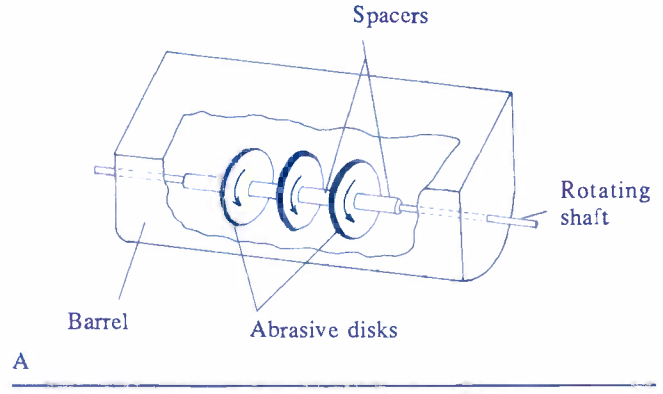
Potential users:

Extension workers, NGOs, and development workers in the agriculture sector. Techniques are useful in areas with erosion problems (hill-side farming) and where population pressure and land degradation increasingly limit the availability of fertile land for farming.

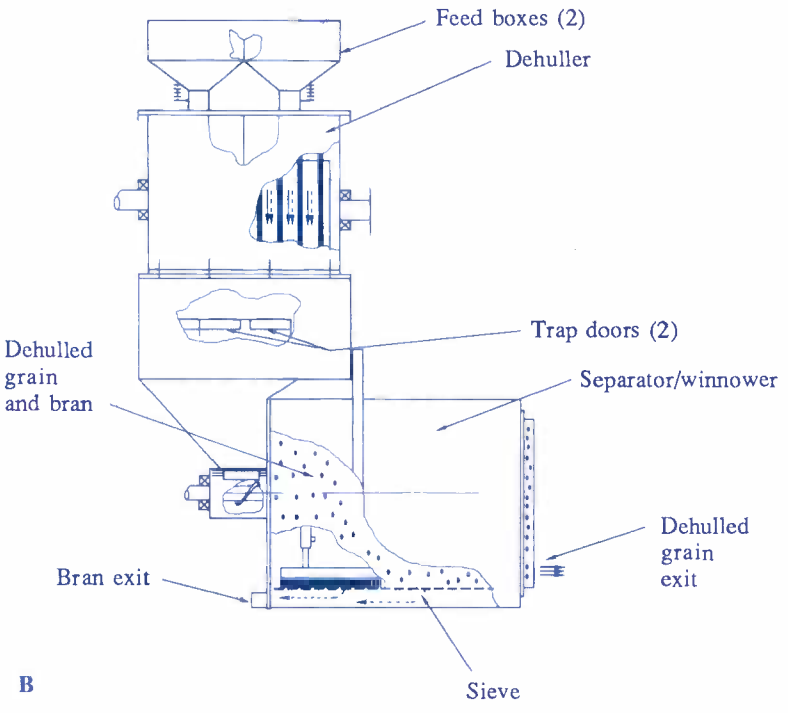
Contact:

Kwesi (A.N.) Atta-Krah, Coordinator, AFNETA, International Institute of Tropical Agriculture, Oyo Road, PMB 5320, Ibadan, NIGERIA
Telephone: (234-22) 400300/400314; Telex: TDS IBA NG 20311 (Box 015) or TROPIB NG 31417

Grain Dehulling in Africa



A



B

A. Basic design concept of the abrasive-disk dehuller.
B. Simplified schematic of the mini-CIS II dehuller. Two feed boxes allow the simultaneous dehulling of two batches while a third one is being winnowed (bran is separated from the grain).

Grain Dehulling in Africa

Description:

The Société industrielle sahélienne de mécaniques, de matériels agricoles et de représentations (SISMAR) in collaboration with the Institut sénégalais de recherches agricoles (ISRA) has modified and tested a dehuller designed by the Prairie Regional Laboratory (PRL) of Canada's National Research Council. As a result, several grain dehullers were tested under rigorous laboratory and village conditions. This has led to cheaper and better performing dehullers, the mini-SISMAR/ISRA dehuller that is now being manufactured and commercialized by SISMAR.

The mini-SISMAR/ISRA dehuller is only one model of a grain dehulling design that has been adapted in several countries of Africa as well as in India. These dehullers are all based on rapidly rotating abrasive disks. They can adequately process the small amounts of grains traditionally ground by families. Tests gave satisfactory results and also led to improvements in the dehuller in terms of durability, simplicity, and purchasing cost.

African women spend anywhere from 2 to 5 hours each day dehulling and grinding sorghum and millet using traditional methods. The dehuller is now starting to change this method in some African countries. The dehuller can remove the husks of grains traditionally eaten, such as sorghum, maize, and millet, and legumes, such as cowpeas. Once dehusked, these can be put through hammer mills to produce flours that can compete with the growing availability of imported wheat flour. Removal of the husks makes cooking easier and improves the texture. Taste is also improved by removing the bitter elements found in the outer hull of these grains.

Dissemination:

Manufactured in Botswana, Canada, Gambia, India, Sénégal, and Zimbabwe; also disseminated in Burkina Faso, Cape Verde, Egypt, Ethiopia, Ghana, Kenya, Malawi, Mali, Niger, Nigeria, Somalia, Sudan, and Uganda.

Potential users:

Village organizations, women's groups that have traditionally handled sales of local cereals in the villages, commercial millers in urban centres, and cooperatives.

Prerequisites:

There should be an evident demand for the mill; it is essential that ongoing maintenance and repair to the mill are possible.

Contact:

Mr Hyacinthe Modou Mbengue, ISRA-CNRA, BP 53, Bambey, SENEGAL;
Telephone: (221) 23-60-50; Telex: 61117 SG.
Manufacturers: SISMAR, BP 3214, Dakar, SENEGAL;
Rural Industries Innovation Centre, Private Bag 11, Kanye, BOTSWANA;
Nutana Machinery, 2615 First Avenue North, Saskatoon, SK, CANADA, S7K 6E9;
Catholic Relief Services, PO Box 569, Banjul, GAMBIA;
Grain Quality Laboratory, ICRISAT, Patancheru, AP, INDIA;
Environment Development Activities – PO Box 3492, Harare, ZIMBABWE.

Food Businesses for Indian Women

The moment of truth comes when customers buy the sorghum and millet snacks. It is the culmination of a long process that involved acquiring and mastering new dehulling and milling technology and then developing and testing numerous new recipes.

Food Businesses for Indian Women

Description:

The Indian Council of Agricultural Research and the College of Home Science in Hyderabad, India, helped establish a small-scale, food-production business sector that is an important income-generator for women's groups associated with the Bharatiya Grameen Mahila Sangh (National Association for Rural Women) program. The latter organization is involved in rural development, nutrition, child care, water management, leadership training, literacy, socioeconomic schemes, smokeless hearths, and other programs.

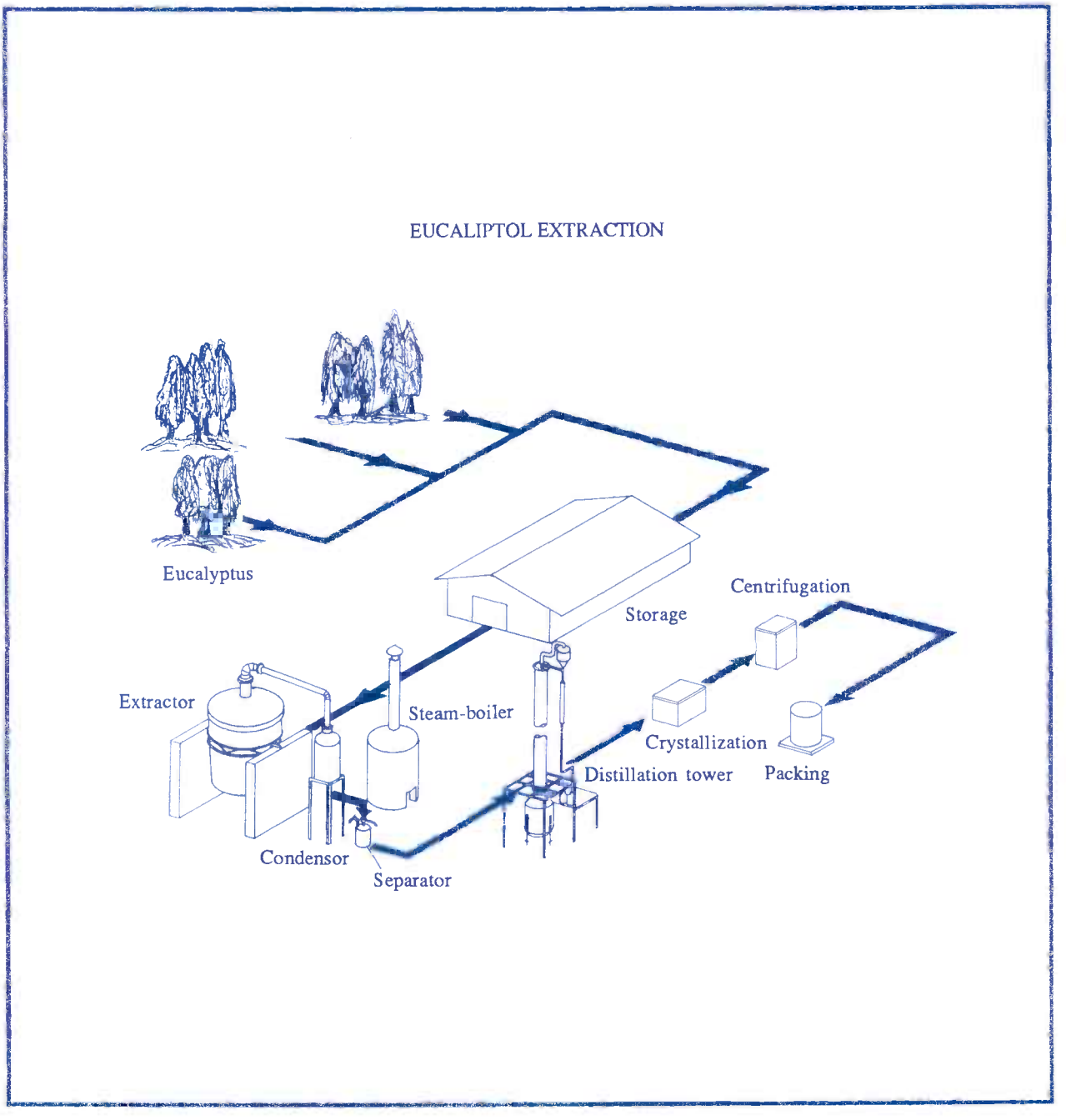
Researchers in India have combined their efforts to make sorghum and millet more accessible to people. Dehulled sorghum and the other grains and legumes, once freed of their husks, become more acceptable to consumers. Dehulled sorghum and legume flours were shown to be just as nutritional and as versatile for cooking purposes as rice and wheat flours. The technology itself includes:

- Introduction of minidehullers at the household, village, and periurban level. (Initially, minidehullers were imported from Canada. Dehullers, adapted and modified, are now produced in India.); and
- Recipes using these products. These are tested and demonstrated in villages and promoted through newspaper columns. Government supplemental feeding programs are using these recipes for infant foods and in porridge, biscuits, and buns. The end results are profitable **food enterprises like village bakeries** run by women.

Contact:

Mrs A. Wahabuddin Ahmed, Bharatiya Grameen Mahila Sangh, Savithri Nagar, Sheikh Sarai, Phase I, New Delhi - 110017, INDIA
Telephone: (91-11) 52.11.27 (office); (91-842) 37860 (residence).

Low-Cost Extraction Techniques for Essential Oils



In Bolivia, there are now seven cooperatives gathering eucalyptus leaves and extracting eucalyptol through a steam-extraction process. The extraction of citral, from lemon grass, is done through a similar technique.

Low-Cost Extraction Techniques for Essential Oils

Description:

The Programa Agroquímico of the Faculty of Sciences and Technology of the Universidad Mayor de San Simón (UMSS) in Cochabamba, Bolivia, has applied **steam-extraction technology** to make Bolivia self-sufficient in the production of several essential oils such as menthol, citral, and eucalyptol. Oil extraction using steam is a comparatively simple and inexpensive process that is readily adaptable to rural areas. The primary **steam-extraction techniques** used can be learned easily by the rural population in a matter of weeks and do not involve sophisticated industrial technologies, which are frequently inappropriate and almost always costly.

Objectives:

Create jobs and generate incomes in rural areas. In the short term, reduce Bolivia's annual $800 000 imports of menthol, citral, and eucalyptol oils needed for the production of detergents, soaps, ointments, and other domestic products that have a combined Bolivian market of $3.5 million. In the long term, make Bolivia self-sufficient in and, then, an exporter of essential oils.

Dissemination:

The use of the simplified **extraction techniques** is creating jobs and generating incomes for many disadvantaged farming families in Cochabamba province, one of the poorest in Bolivia. Bolivia's per capita GNP is USD 580. It is estimated that, currently, the income generated from the program supports 64 families. Seven cooperatives are at work gathering the leaves and grass for extracting oils and processing natural extracts. The program is successful enough that an additional 36 communities have been approached to start the processing of eucalyptus and lemon grass. Another five communities have already started cultivating lemon grass. The project's success can be measured by the first exports of oil extracts to Brazil, France, and the United States.

Prerequisites:

Availability of cultivable, vegetal, renewable resources, such as eucalyptus trees, lemon grass, and mint.

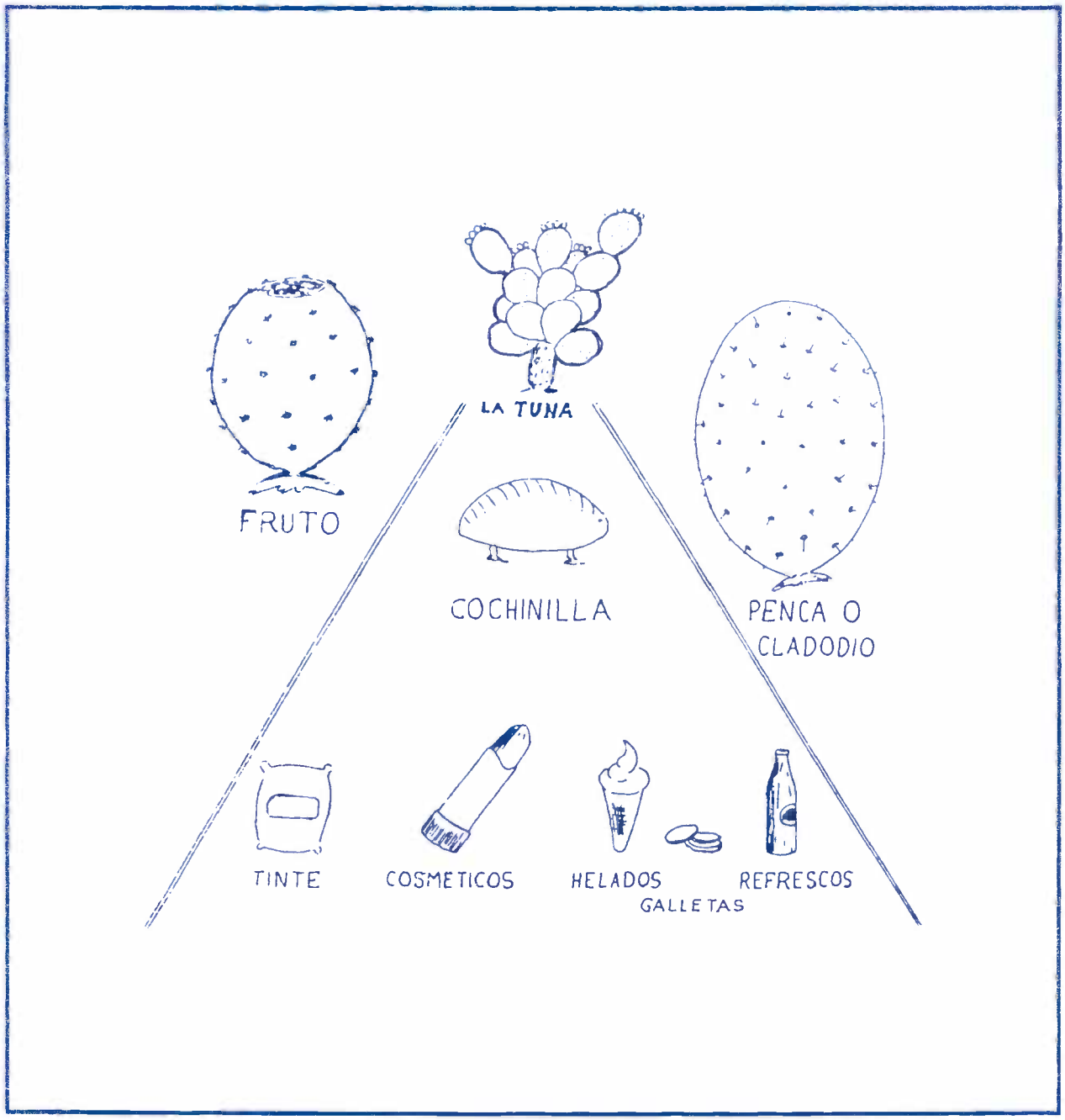
Potential users:

Rural- or small-town communities with available supplies of oil-bearing plants or trees, such as eucalyptus or lemon grass.

Contact:

Jorge Soriano Ferrufino, Project Leader, Programa Agroquímico "Cordeco-UMSS", Casilla de correo 992, Cochabamba, BOLIVIA
Telephone: (591-42) 32548; Telex: 6363 UMSS BV; Fax: (591-42) 33648.

Carmine Dye Extraction Process for Rural Enterprises



Cactus is the only crop that can be cultivated in some of the semi-arid valleys of the Peruvian Andes. Communities have learned how to grow the cactus and use it for several purposes including the production of honey and for feeding animals. Now, there is a growing demand to harvest cochineal insects that thrive on the cactus and from which carmine dye can be extracted.

Carmine Dye Extraction Process for Rural Enterprises

Description:

Peru is the major supplier of carmine dye, a natural, red-colouring agent that is used in foods, drugs, and cosmetics. Global restrictions on artificial colorants in food and other consumer items is giving Peru a considerable boost. By 1991, many synthetic red dyes will be prohibited in the United States. This will put Peru in a unique position. Currently, it furnishes 80% of the world's cochineal supply — about 50% as a dye and 50% in insect form.

The Peruvian government wants to increase processing of the carmine dye, given that cochineal are plentiful, rural people are experienced in harvesting the insects and drying them, and extraction techniques are comparatively simple. Processing plants close to cochineal production areas will increase rural industry and employment opportunities.

The **extraction process** is available to small-scale enterprises/NGOs including information on how to improve the management of the cochineal insects including infestation, harvesting, and drying.

Organizations:

The Instituto de Investigación Technológica Industrial y de Normas Técnicas (ITINTEC), in collaboration with Simon Fraser University, has improved the **carmine dye extraction process** from an 18% yield to 22%. Carmine dye is derived from the cochineal insect by a solvent extraction method. A new phase is exploring increased infestation, harvesting, and drying processes. The pilot production plant has been optimized and the technology is now being transferred to the private sector, but with conditions ensuring operations will be close to cochineal producers and generate employment among rural people.

Dissemination:

ITINTEC can provide a cost analysis of the implementation of the technology.

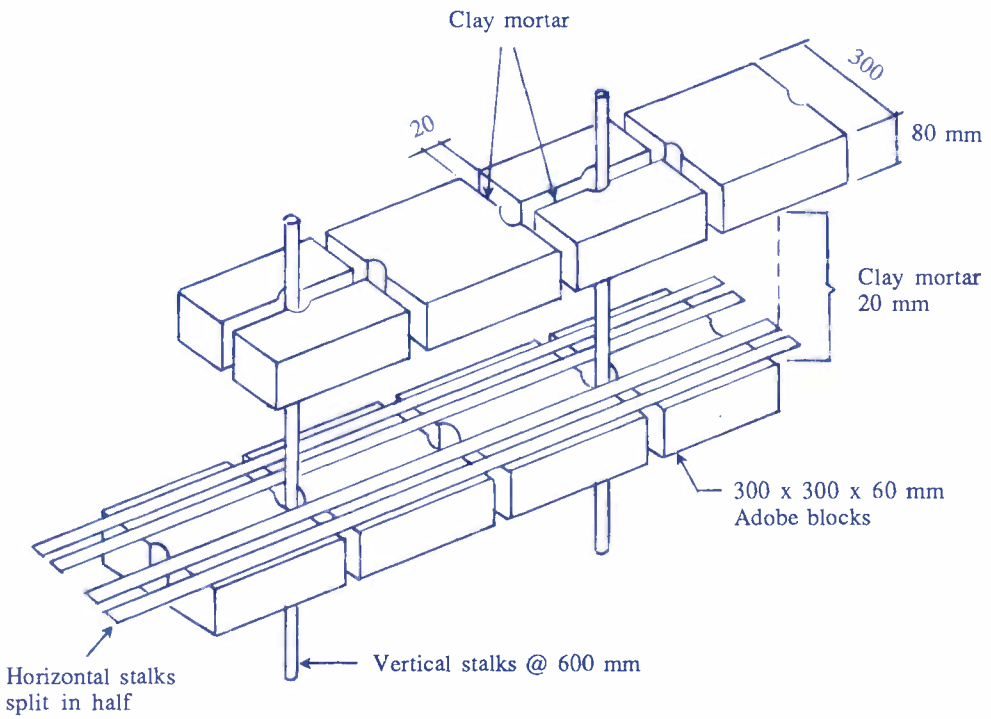
Potential users:

Cochineal exporters and producers as well as current producers of carmine who are interested in an improved yield process.

Contact:

Dr A.C. Oehlschlager, Department of Chemistry, Simon Fraser University, Burnaby, British Columbia, CANADA V5A 1S6
Telephone: (604) 291-4884; Fax: (604) 291-3764.
Ing. Guillermo Salas, Director-General, ITINTEC, Lima, PERU
Telephone:71.17.77; Fax:51-14-71.16.17; Telex: 20496 PE

Quake-Proof Adobe Housing Construction Methods



The reinforced adobe housing technology developed in Peru at the Pontificia Universidad Católica in Lima introduces horizontal and vertical canes in the body of the walls. This makes these very popular houses much more resistant to earthquakes.

Quake-Proof Adobe Housing Construction Methods

Description:

A collaborative effort between the civil engineering department of the Pontificia Universidad Católica del Perú and the architectural faculty of Concordia University, Montreal, has produced safer adobe housing for the poor in a major earthquake zone. Adobe houses are built of earthen brick. It is popular because it is available, inexpensive, can be built by unskilled workers, and is fire resistant. It lacks the strength, however, to withstand earthquakes.

In a country where 35% of urban and 65% of rural housing is made of adobe, despite regular earthquakes — the extent of damage in the 1970 earthquake: 60 000 homes destroyed, 50 000 people dead — points to the shortcoming of such traditional housing.

The **new construction methods** that have been developed include several improvements such as the addition of straw and sand to control cracking caused by shrinkage. Reinforcement by inexpensive eucalyptus poles anchored to the foundation together with horizontal cane tied to the poles strengthens the walls. The addition of a tie beam, made of two parallel wooden elements, crown the walls and fix the vertical canes and horizontal reinforcements.

Organizations:

The civil engineering department of Pontificia Universidad Católica del Perú is staffed with highly trained and dedicated researchers. The design expertise in the architectural faculty of Concordia complements the structural and material testing capabilities of the Catholic University of Peru.

Dissemination:

Several prototype structures have already been built in cooperation with the Ministry of Health — health outposts; the Ministry of Education — schools; FAO — a small, community cheese-processing unit and several other community centres in cooperation with community organizations in "pueblos jovenes."

Prerequisites:

The most important condition is to have adequate soil available. The technique itself is easily explained with the aid of pamphlets and video programs. The practical application requires no special skill other than that of a common mason.

Contact:

Gladys Villa Garcia, Laboratorio de Estrúcturas Antisísmicas, Pontificia Universidad Católica del Perú, PO Box 1761, Lima 100, PERU
Telephone: (51-14) 622-549 ext. 259; Telex: 20300 PE PB SMGL; Fax: (51-14) 611-785.

Low-Cost Cement Using Volcanic Ash

Pozzolans of most interest are of volcanic origin, and 5% of the surface of the earth consists of volcanic rocks. In Central and South America, the most widespread use of pozzolans is in Chile (85% of the cement produced includes pozzolans). Countries where they are used or studied are: Argentina, Bolivia, Brazil, the Caribbeans, Colombia, Ecuador, and Guatemala.

Low-Cost Cement Using Volcanic Ash

Description:

The Centro de Investigaciones de Ingenieria at the Universidad de San Carlos de Guatemala and the Department of Civil Engineering at the University of Calgary are testing **pozzolan cement** as a substitute for Portland cement. It is being checked for strength and resistance to earthquakes.

Earthquake zones invariably contain large surface-deposits of volcanic origin and include pozzolanic materials. Mixed with lime, natural pozzolan (volcanic ash) can take on a cementitious form. Although some grinding is required to get it fine enough to work with, the pozzolan mix does not require firing to achieve cementitious properties as does ordinary Portland cement, thus reducing processing costs.

The **pozzolan cement** can be used for blocks, masonry mortar, and as a stabilizer for adobe walls and the base of roads. Four demonstration houses have been built using pozzolan. Workshops are encouraging small pozzolan cement production plants in rural areas near pozzolan deposits.

About 50% of the population of Guatemala live in inadequate housing. The prospects of changing this figure hinges on the cost of building materials, which make up as much as 65% of the price of a house. The cost of Portland cement makes a low-cost replacement attractive.

Organizations:

The Centro de Investigaciones de Ingenieria at the Universidad de San Carlos de Guatemala is accredited for testing building materials and has conducted research that has developed and evaluated local building materials. The Department of Civil Engineering at the University of Calgary has actively supported and promoted the use of fly ash in various construction applications in Canada.

Potential users:

Potential users of the technology are local building contractors and government agencies who are building low-cost housing in developing countries in regions of Latin America, Africa, and Asia where there has been volcanic activity resulting in extensive pozzolan deposits.

Prerequisites:

Supplies of pozzolan and lime, some skilled staff, building standards, and quality control.

Contact:

Ing. Javier Quiñones, Centro de Investigaciones de Ingenieria, University of San Carlos, GUATEMALA
Telephone: (502-2) 76.39.92; Fax: (502-2) 76.39.93
Dr Robert Day, Civil Engineering Department, University of Calgary, 2500 University Drive NW, Calgary, Alberta, CANADA T2N 1N4
Telephone: (403) 220-7489; Fax: (403) 282-7026.

For further information:

Day, R.L. "Pozzolans for Use in Low-Cost Housing: A State-of-the-Art Report," IDRC, Ottawa, September 1990, 157 pages.

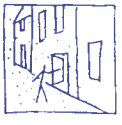
Teaching Low-Cost Building Techniques With Picture Scripts

What's in a house?

How do I use a house?

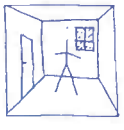
First, I'm in the street

Outside.



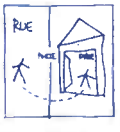
I open a door
and then enter

Because
it is raining outside



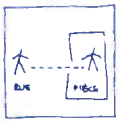
I open the door
and find myself
in a room
Inside

Outside, it is raining
Inside, I have shelter



I would like to make
a drawing of this
simple story

The dotted line
shows my course



Or, more simply,

Or, even more simply;

These maps show
only my course.

They don't show how is
the street or the room

Then, which rules
should I follow to
draw a house map?

At the beginning,
there exists an "outside"

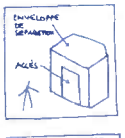
Then,
a section of that "outside"
(enclosure)
becomes separated

This enclosure separated
from the "outside"
is useful only if accessible
(if one can enter in it)

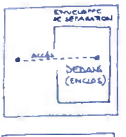
The physical conditions
in this separated and accessible
piece of outside

are different
from the outside conditions

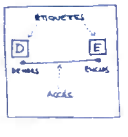
Architecture means
1. Separation of a piece
of the outside
2. which must be accessible
3. and where conditions
are different than
before separation



The same concepts
can be drawn in a different way



and in another way



or also like that:
here
one • represents an enclosure
one – represents an entrance
E represents difference
between two enclosures

With these symbols
you can map a building.

The Communication Centre of Scientific Knowledge for Self-Reliance, Paris, has developed picture-scripts that help people understand their housing needs better and then build the most suitable housing. Yona Friedman, from the Centre, has developed an architectural language with picture-scripts, which are used by India's Directorate of Adult Education.

Teaching Low-Cost Building Techniques With Picture Scripts

Description:

The very poorest population of India has neither access to the technical know-how nor the financial resources to build acceptable housing. A novel approach to teach low-cost housing techniques is being used with "picture scripts" that are easily understood, easy to copy by hand, and adaptable to suit each audience. They are a means of imparting knowledge directly to the people concerned, rather than through intermediaries.

Organization:

The Communication Centre of Scientific Knowledge for Self-Reliance (CCSK) disseminates information on a variety of low-cost, appropriate technologies (including house building, agriculture, and animal husbandry), health, nutrition, and sanitation using small-scale models and picture-script booklets. The focus of the project disseminate information building techniques, with special emphasis on the roof, which is the most difficult and crucial part of the house to build. The booklets, in Hindi and Tamil, address different climatic conditions. They focus on bamboo and aluminum foil, two cheap materials that provide excellent insulation from humidity and heat. Local craftspeople can easily prefabricate the bamboo structures.

The manuals are part of the Popular Encyclopedia of Survival, which is being produced in modular form. They are being used by India's Directorate of Adult Education in its national literacy programs. Besides Hindi and Tamil, they are translated into several local dialects.

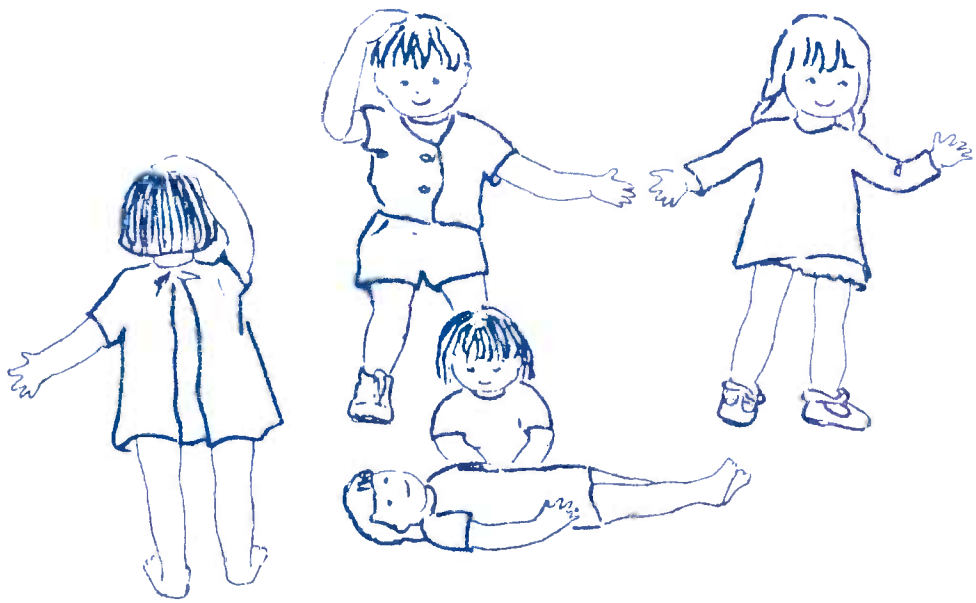
Potential users:

Individuals and community-based organizations interested in constructing low-cost housing and construction materials.

Contact:

Mr Yona Friedman, Communication Centre of Scientific Knowledge for Self-Reliance, 33 Boul. Garibaldi, 75015 Paris, FRANCE
Telephone: (33-1) 47.83.20.24 and
Museum of Simple Technology, Anna University, Madras, India.

Educational Games for Pre-School Children



Traditional games played in the street or in-house can be used to teach many subjects to children. In this game, one child draws another's silhouette on the floor (covered with old newspapers). Children have to identify each part of the body as they are drawn.

Educational Games for Pre-School Children

Description:

Traditional Indian and popular children's games are providing educators with a tool that promotes language competence, social learning, cultural values, abstract thinking, mathematics, and other cognitive skills among pre-school, Andean children living in isolated rural areas.

The **educational games** were tested in rural communities in Colombia with very good results in the intellectual achievements of children and the attitudes and behaviour of mothers.

The games provide a low-cost mechanism for pre-school education where no formal pre-school facilities are available. They also reinforce cultural aspects of indigenous people that have been either weakened or lost in recent times. In Colombia, the Instituto Colombiano de Bienestar Familiar (ICBF) is already using the games in its Hogares populares (Popular Homes).

Objective:

Overcome educational constraints for indigenous people living in poor rural and urban areas in Latin America. UNICEF estimates that no more than 10% of the children in the region receive systematic, pre-school educational services.

Organizations:

- Centro de investigación sobre el desarrollo infantil (CIDIE) — the Research Centre for Child Development — is a small, very effective institution whose main aim is the investigation and development of innovative methods and techniques for teaching disadvantaged children. CIDIE's director and principal researcher, Dr Cecilia Bustamante has more than 20 years experience working on early child development and primary education for poor children.
- Instituto Colombiano de Bienestar Familiar (ICBF) coordinates services to Colombia's infant population and operates a network of Hogares populares, community-based homes for children coordinated by a mother in collaboration with child-care workers. Each centre works with an average of 15 children between 2 and 6 years of age.

Dissemination:

Andean peasant communities in Bolivia, Colombia, Ecuador, and Peru.

Potential users:

Educational and pre-school child-care organizations working with poor families with pre-school children throughout Latin America.

Prerequisites:

The implementation of the technique requires a brief training period and materials. Manuals are included with training.

Contact:

Dr Cecilia Bustamante, Carrera 19, No.74-44, Bogotá, COLOMBIA
Telephone: (57-1) 217-5067; Fax: (57-1) 13.92.19 or (57-1) 13.91.81.

Spanish-Language Software for Basic Education

Not only can children learn grammar and mathematics with computers, they can also become familiar with an important communication technology that can link them with children from other continents.

Spanish-Language Software for Basic Education

Description:

The Colombian government is looking at the potential of high-level technology to increase technical literacy. In response to this thrust, many schools buy computers. These purchases are made without having adequate information on their educational possibilities, their limitations, and their social implications. They are often used inefficiently and create new problems. In Colombia, multinational companies saturate the market with products, some written in English only, and their educational quality is a serious concern. Little educational software is available in Spanish.

Dissemination:

Since 1984, the Instituto SER de Investigación has evaluated the impact of computers in rural and other schools in Bogotá. The activity was designed to study the impact of the technology in areas such as creativity, self-conceptualization, and attitudes of children enroled at the elementary school level.

After the first year, SER came to the conclusion that software in Spanish had to be designed because little was available in Colombia. SER developed two mathematics and two Spanish programs that could be used in the schools. Another four programs were later produced when funding was made available.

Teachers can select given levels of difficulty with some programs and use them with students from different grade levels. The Spanish programs have a module that allows the teacher to create exercises taking into account individual students. The **educational software programs** were designed so that students feel they are playing interesting games rather than answering rigid questions and performing tedious tasks.

Potential users:

Any school with Atari- or IBM-compatible computers in any Spanish-speaking country.

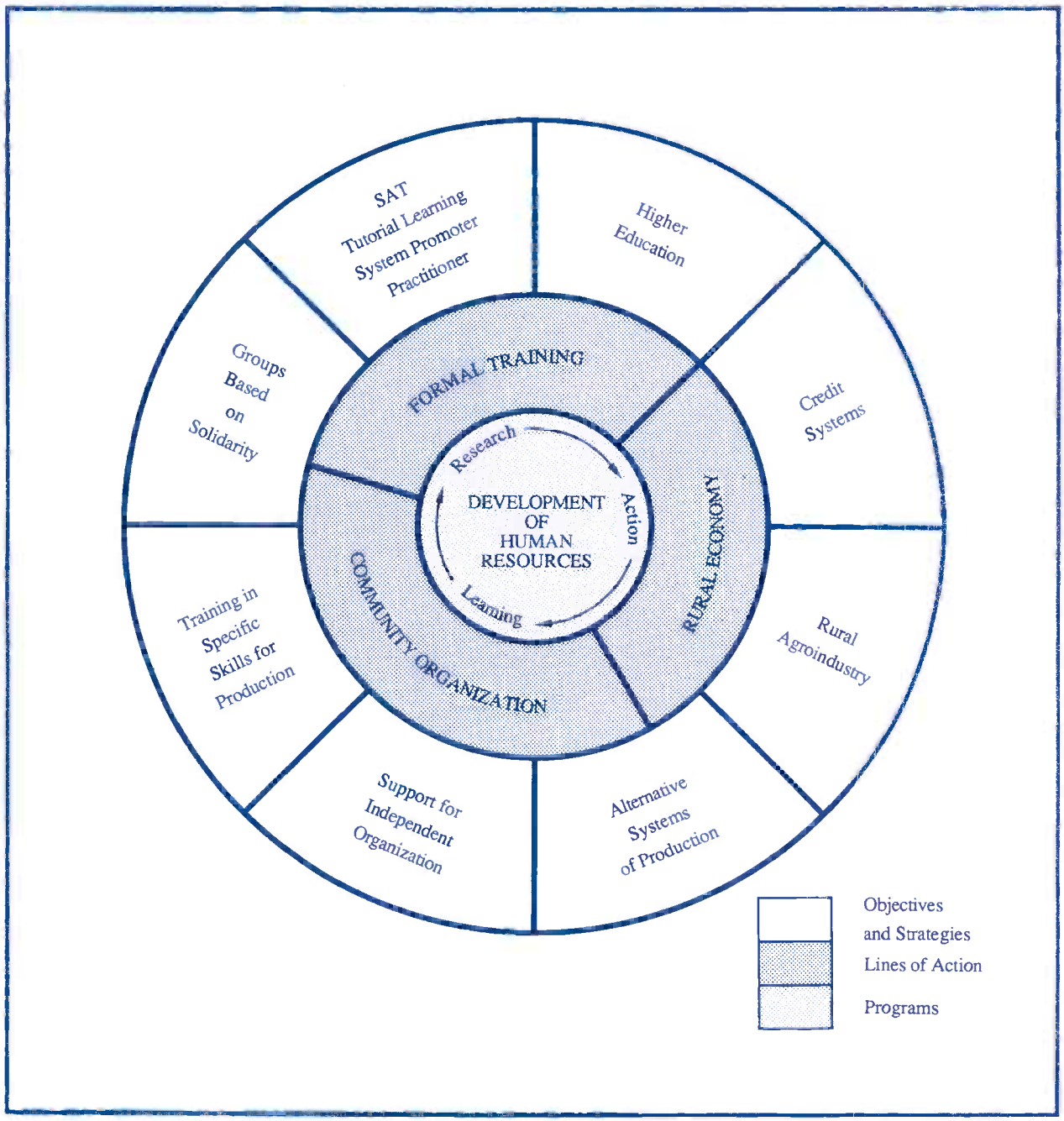
Organization:

SER, a nonprofit organization, has considerable experience in educational matters. It takes a multidisciplinary approach to assignments.

Contact:

Carlos A. Rojas C, Instituto SER de Investigación, Carrera 15A No 45-65, A.A.1978, Bogotá, COLOMBIA
Telephone: (57-1) 288 01 00; Cables: SERIN; Fax: (57-1) 245-5248 or (57-1) 226-803

Rural Community-Based System for University-Level Education



The Learning System developed by FUNDAEC (the Fundación para la Aplicación y Enseñanza de las Ciencias) integrates the community with a body of courses and research ventures. It is a strategy of investigation – action – learning that keeps the curricula very close to the real needs of the community.

Rural Community-Based System for University-Level Education

Description:

The "Rural University" offers a package to create a **rural community-based university** setting: courses, books, training, and tutorials. The process consists of integrated activities revolving around one central process: the development of human resources. The general strategy has been one of investigation–action–learning. This permits scientific knowledge to be directly linked to the application of technology and to channel what has been learned into the curricula. The University's specific and interrelated systems focus on community organization, application of science and technology to the rural economy, and formal training.

The Colombian Ministry of Education and some NGOs adopted the Sistema de Aprendizaje Tutorial (SAT), a tutorial learning system that is the equivalent of 2 years of high school, and its curriculum. Students study mathematics, language, science, and technology under the tutorship of "engineers" in their own villages. The "engineers," who study for 3 more years, are the equivalent of university graduates. "Technicians," trained through the SAT system, study for 2 more years using **research-action learning packages**, such as doing a detailed study of village sanitation and relating it to health. Some of their research ventures have led to new systems of agriculture and animal production.

Organization:

The Fundación para la Aplicación y Enseñanza de las Ciencias (FUNDAEC), the Foundation for the Application of Teaching of the Sciences and founder of the Rural University in Arrobleda near Cali, Colombia, has a philosophy that disadvantaged rural people can not only benefit from higher education but can also help to create and exploit new technologies to improve their standard of living. FUNDAEC seeks to dispel the image of the poor farmer whose life must be planned and managed by the more privileged members of society.

Potential users:

Ministries of education, institutes for the improvement of agricultural and animal production, NGOs, agricultural or microenterprise policymakers.

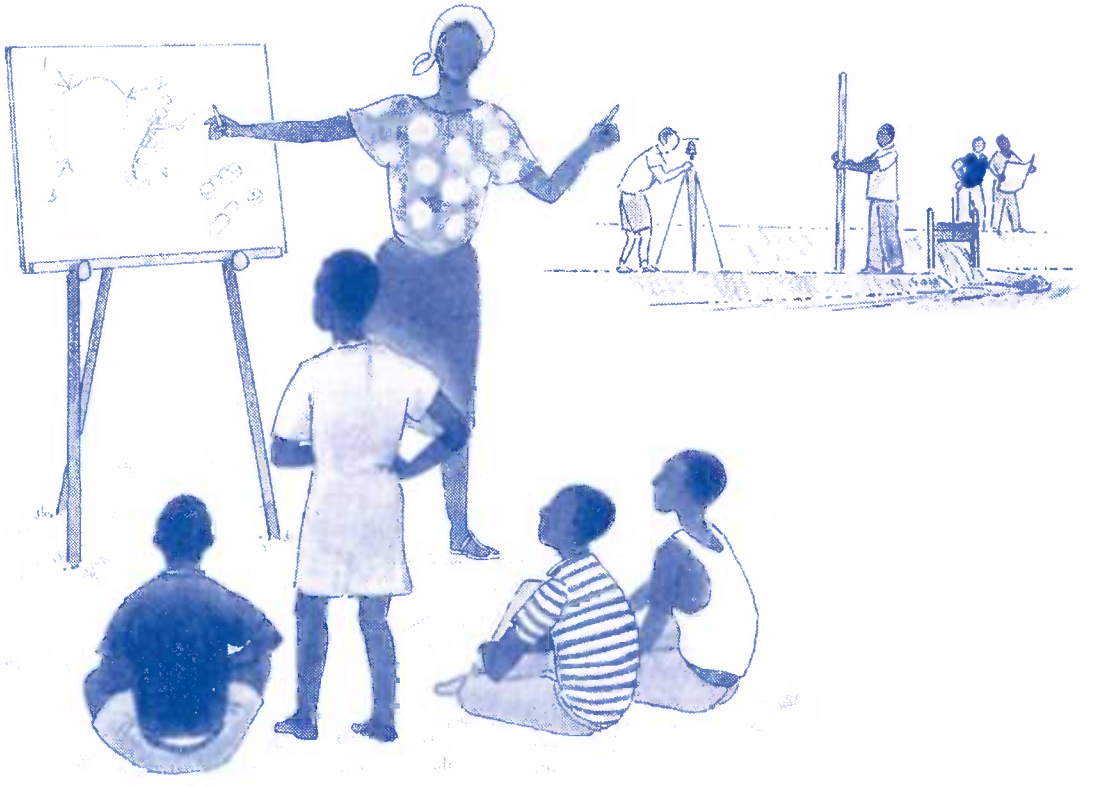
Prerequisites:

Training and use of educational materials developed by FUNDAEC. Agricultural and animal production techniques are linked to community organizations. FUNDAEC provides training by means of seminars and workshops for interested organizations.

Contact:

Haleh Arbab, Director, A.A. 6555, Cali, COLOMBIA
Telephone: (57-23) 560-164 or (57-23) 574-218; Fax: (57-23) 569-832

Community-Based Approach to Schistosomiasis Control



Schistosomiasis is transmitted by a parasite whose development cycle includes living in two host species: snails and humans. All strategies designed to contain this disease must involve the communities because it is only by changing behaviour that progress against schistosomiasis can be made.

Community-Based Approach to Schistosomiasis Control

Description:

Schistosomiasis, a debilitating water-borne parasitic disease, is widespread in areas where it is endemic in Africa. It affects more than 300 million people in Africa, Asia, and Central and South America and, according to World Health Organization estimates, another 500 – 600 million are at risk. The disease is caused by a tiny parasitic flatworm that lives part of its life-cycle in humans where it causes fatigue, fever, and diarrhea as well as damage to the liver and spleen. Of Zimbabwe's 9 million population, it is estimated that more than 2 million suffer from schistosomiasis.

Organization and methodology:

The Blair Research Laboratory was established in 1939 and has a long history of research into malaria and schistosomiasis. The institute is world renowned for the development of the Blair Ventilated Improved Pit Latrine and the Blair series of PVC handpumps. The laboratory in Zimbabwe tested an **integrated community-based approach to control schistosomiasis** within the primary health care system in the country. This involves community self-help sanitation and water programs, health education, chemotherapy (using praziquantel), and a focused antisnail program (freshwater snails act as hosts for the other part of the schistosomiasis life-cycle).

Community-based integrated approaches to the control of schistosomiasis are feasible on a small scale, but a lot of managerial, material, and financial changes may be required in adopting such an approach on a national level.

Dissemination:

The sanitation program in the two villages was very successful, with 2455 latrines completed (53.4% of them were double-compartment units). Although there were problems in motivating some members of the community, an evaluation of structure and function showed that the latrines were acceptable and used by most household members. An adoption survey showed that families who built latrines were wealthier than average.

By completion of the project, 104 of the target of 150 handpumps had been installed. An attempt at setting up water subcommittees to maintain and repair installed pumps met with inertia. The community failed to demonstrate a sense of ownership of the protected water points. It was recommended that a more feasible approach to water supply be adopted.

Washing slabs were constructed at most boreholes and water-use surveys indicated that these alternative laundry facilities have an important impact on water usage. Results of the project endorsed the need for an integrated approach to schistosomiasis control that incorporates a variety of intervention points.

Potential users:

A community-based integrated approach should be acceptable in regions that have a developing economy but need to control schistosomiasis.

Contact:

Dr S.K. Chandiwana, Blair Research Laboratory, PO Box 8105, Causeway, Harare, ZIMBABWE
Telephone: (263-4) 79.27.47; Fax: (263-4) 79.24.80

An Environmentally Friendly Means of Malaria Control

In many regions of the Tropics, malaria is endemic — but so are coconuts. Researchers in Peru have found a way of using coconuts as a self-contained fermenter vessel, culture medium and storage container for Bti, a bacillus that produces toxins lethal to mosquito larvae, the carrier of malaria.

An Environmentally Friendly Means of Malaria Control

Description:

Coconuts may provide a major boost in the battle against malaria. Coconuts are proving to be a simple, inexpensive medium in a new and economical way to check the spread of malaria. The disease has been on the increase in recent years despite wide use of chemical insecticides. The expense, threats to the health of people, environmental degradation, growing insecticide tolerance by mosquitoes, and the short "kill" period all make chemical insecticides less attractive as a means of combating the spread of malaria.

Such is the reach of the disease that, in 1988, malaria accounted for 2.5 million deaths and 489 million clinical cases in the Third World, which also means an enormous loss of resources and productivity. In fact, malaria is a leading cause of hospital and clinic attendance throughout the Third World.

Malaria is endemic in the jungle and humid areas of Peru and it is an ideal place to test new methods in the fight against the disease. Two institutes are developing a new, simple, inexpensive method for the local "artisanal" production of *Bacillus thuringiensis* var. Israelensis (Bti), which may be useful for improved malaria control. Bti is a spore-forming bacillus that produces a specific toxin lethal to mosquito larvae. Whole coconuts are used as self-contained fermenter vessels, culture medium, and storage containers. Bti also has the advantage of being a safe technique not damaging to the ecology.

The toxic strain of Bti fermented in coconuts proved effective as an inoculator against mosquito larvae when applied in the field, lasting between 15 and 25 days. The process also proved easily transferable to local people. Other artisanal techniques are being explored for use in areas where coconuts are not plentiful.

Dissemination:

Dissemination of the technique outside Peru is feasible, but larger educational efforts are necessary. The recently organized Latin American Network for Biological Vector Control may be the most important entity for this task.

Potential users:

People living in malaria-endemic areas, especially those where coconuts are found, may benefit from this new technique for control. An allied, extensive, major educational effort would be necessary.

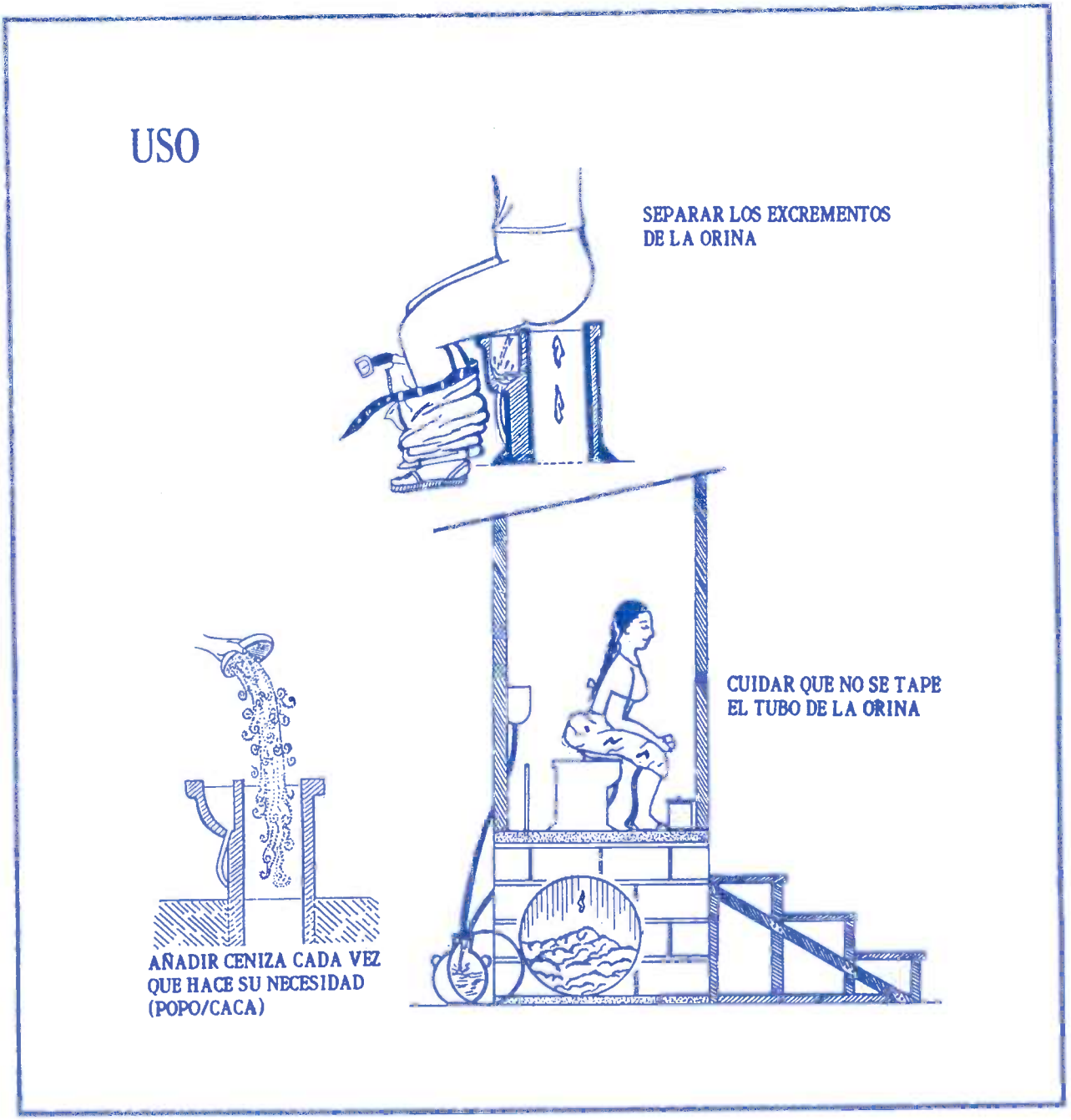
Prerequisites:

- Preparation of Bti kit for field coconut inoculation: microbiologist and technician; culture media; 2-litre fermenter; Bti H-14 strain. Production time required: 72–96 hours. Quality-control period: 24 hours.
- Proper use of Bti kit in the field: trained local people; dependable source of coconuts; small bench area for preparation of kits; educational efforts for community sensitization; dissemination of technique; distribution system for Bti kits and for inoculated coconuts.

Contacts:

Palmira Ventosilla or Cesar Ruiz de Somocurcio, Instituto de medicina tropical Alexander Von Humboldt, Universidad Peruana Cayetano Heredia / Centro de Investigación en Salud Hugo Lumbreras Cruz, Instituto Nacional de Salud, A.P. 5045, Lima 100, PERU
Telephone: (51-14) 823-401; 823-903; 823-910; Fax: (51-14) 823-404

Fertilizer-Producing No-Pit Latrine



In Guatemala, the Dry Alkaline Fertilizer Family (DAFF) latrine has been adopted by several communities with the help of the Centro de Estudios Mesoamericano Sobre Technología Apropiada, one of the country's best known NGOs. The fertilizer-producing capability of this dry latrine (urine and feces have to be kept separate) is an important advantage for the rural communities.

Fertilizer-Producing No-Pit Latrine

Description:

Fecal contamination is a major contributor to mortality among children. The **double-vault Dry Alkaline Fertilizer Family (DAFF) latrine** is the Guatemalan adaptation of the successful Vietnamese double vault latrine. (In Guatemala, it is called the LASF: latrinas aboneras secas familiares.) Besides contributing to an improvement in health, by breaking the cycle of fecal contamination and the spread of diseases such as diarrhea, hepatitis, typhoid, and parasitic infections, the **DAFF latrine** also provides farmers with fertilizer for their crops.

The **DAFF latrine** is an above-the-ground, two-chamber system. A portable toilet seat is placed over the opening of one chamber. After each defecation, wood ash or a mixture of soil and lime is placed in the chamber. This keeps the deposit dry, inhibits odours, reduces the presence of flies, and helps speed composting to fertilizer. The toilet seat is moved to the empty chamber when the first is full. The latter is sealed and left for 6 months, during which time the contents are transformed into a safe, rich fertilizer. An opening in the back wall of the chamber permits easy access to the fertilizer. Urine is funnelled off into a special container, allowed to stand for 3 days, and is then used as a liquid fertilizer.

Other advantages of the **DAFF latrine** is that it requires no pit to be dug. Gaining social acceptance is usually the biggest challenge in getting latrines used. With the DAFF, production of fertilizer is proving the major incentive for greater use of latrines. Commercial fertilizers are too expensive for the majority of rural farmers, many of whom are subsistence farmers.

Organization:

The Centro de Estudios Mesoamericano Sobre Technología Apropiada (CEMAT) in Guatemala is known internationally for its high-quality, socially relevant, and practical community development projects. During 1982–86, CEMAT transferred the DAFF building technology to 10 national and international NGOs and five public national institutions working in the field of sanitation. At the international level, the technology was transferred to Mexico, the Dominican Republic, and Panama. In Mexico, 43 community leaders from seven countries were trained in DAFF technology.

Later in 1986–1987, a survey conducted in Guatemala showed that 16 institutions had installed 3000 DAFF latrines in different parts of the country.

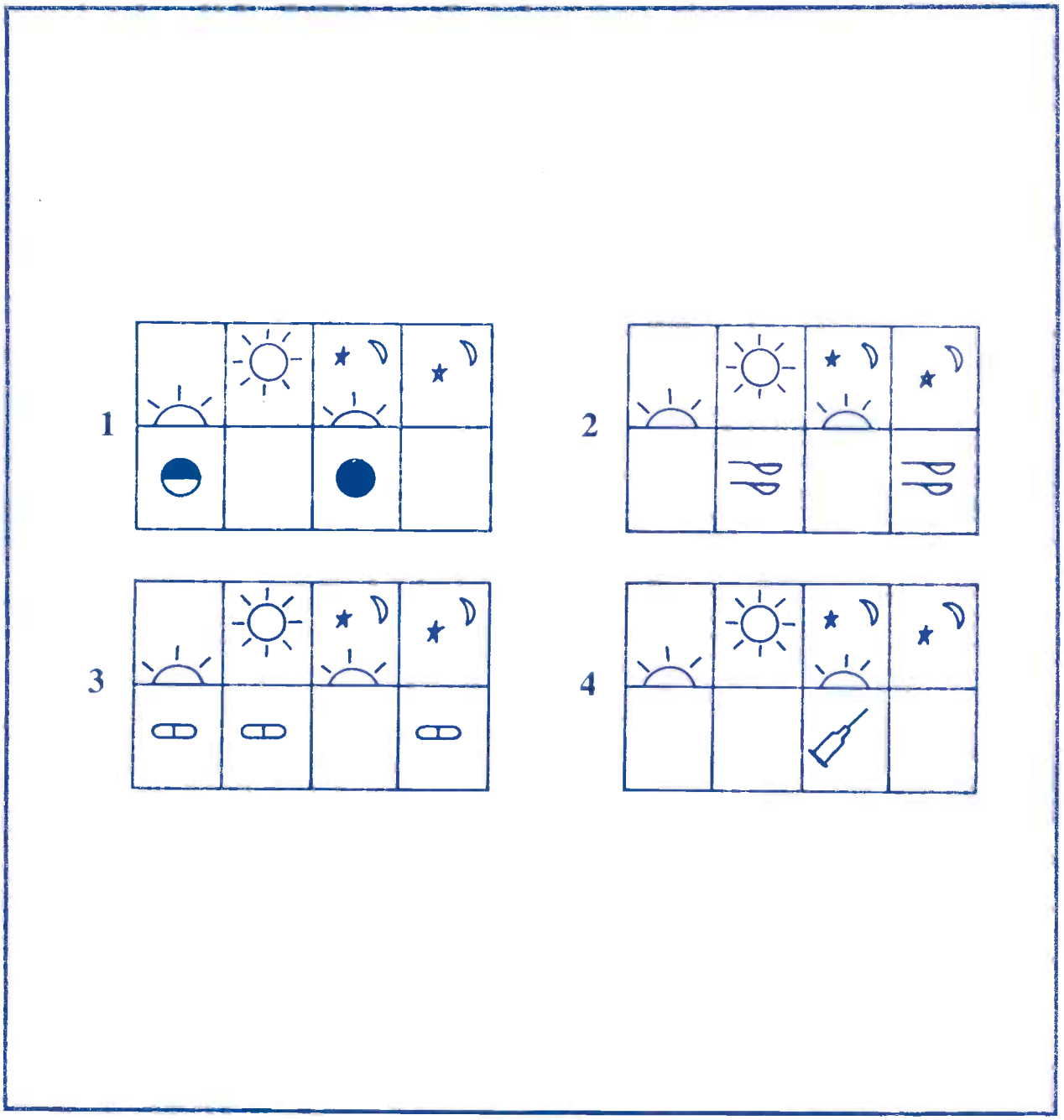
Potential users:

Rural residents and particularly where it is difficult to dig pit latrines.

Contact:

Dr Edgardo Caceres, Executive Director, CEMAT, 1a Av.32-21, Z. 12, A.P. 1160, Guatemala 01012, GUATEMALA C.A.
Telephone: (502-2) 762-355; 762-018; Fax: (502-2) 762355

Equipment and Training Packages for Health Workers



CIMDER (Colombia) has created a great variety of equipment and strategies to support primary health care workers. These diagrams help families to remember (1) to take one pill in the morning and one in the evening, (2) two teaspoons at noon and in the evening, (3) three pills/day, and (4) one injection.

Equipment and Training Packages for Health Workers

Description:

The Centro de Investigaciones Multidisciplinarias en Desarrollo Rural (CIMDER's) health care package is a set of **simple and innovative materials and equipment for primary health care workers.**

- The tri-coloured tape for measuring the arm circumference of children identifies malnourished children and acts as a guide in assessing the health of children. The tape has also spurred community groups to improve community health services and to work on improving health and nutrition by forming cooperatives to increase crop production.
- The microlab for diagnosis of simple ailments. The microlab contains such elements as microstix for urine cultures and analysis, sterile bags, etc.
- The microhealth post, with first aid equipment and drugs for common illnesses, permits the primary health care worker to manage 60% of the illnesses encountered.
- The master file, with its colour-card information system, has a health flag that indicates the community health situation.
- Other components consist of a backpack; a well chlorinator for small wells and water tanks; and manuals on primary health care, maternity and child care, sanitation, community organizing, and immunization.

Objectives:

To design, implement, and evaluate health technologies and programs, i.e., primary health care, social participation in health, health education, and the management of regional health institutions (health posts and centres, local hospitals).

Organization:

CIMDER is a multidisciplinary organization of professionals that has had a major impact on primary health care in five Latin American countries. An essential element of CIMDER's considerable success is the emphasis placed on strong community organization and participation through training programs for family leaders, rural volunteers, community workers, and health promoters.

Dissemination:

Colombia (14 areas), Bolivia, Ecuador, Guyana, and Paraguay.

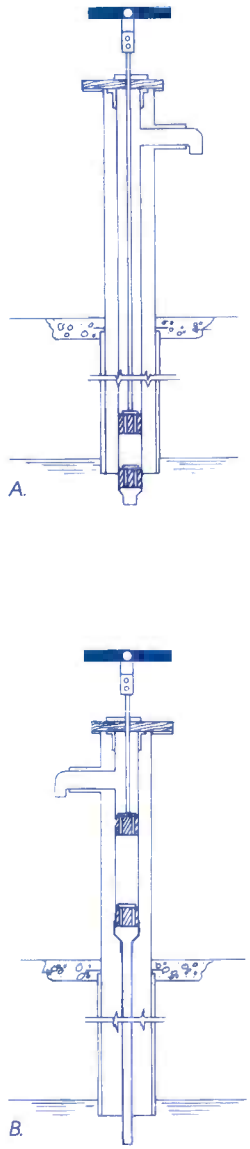
Potential users:

Community leaders, community health workers, volunteers, health officers, students, and all those involved in health care delivery.

Contact:

Ligia Malagon de Salazar, Director, CIMDER, Universidad del Valle, Facultad de Salud, A.A. 3708, Cali, COLOMBIA
Cable: 4B # 36-00; Telephone: (57-23) 56.45.05; Fax: (57-23) 56.25.75

Women Manufacturing and Installing Handpumps



Sarvodaya Economic Enterprises Development Services in Sri Lanka manufactures several models of handpumps. A. Force pumps are more difficult to install and repair but can draw water from deeper levels. B. Suction pumps are easier to install and repair but are limited to a depth of 8 meters.

Women Manufacturing and Installing Handpumps

Description:

Sarvodaya Shramadana Movement, Sri Lanka's largest NGO, has developed a unique training approach that demonstrates the ability of young, rural women to become self-sufficient economically while providing a much-needed service to their rural communities. A division of Sarvodaya, the Sarvodaya Economic Enterprises Development Services (SEEDS) achieves this objective by providing training in handpump technology, metal work, carpentry, masonry, and other skills. SEEDS is now using women already trained in the manufacture, installation, and maintenance of handpumps to train 90 other women. These "women of the handpump" will then operate six town workshops and eight village workshops for the manufacture of pump components as well as tools. The women will use the income generated from these enterprises to sustain the installation and maintenance of the pumps.

Sarvodaya also trained women in shallow well-drilling techniques, health and sanitation, management, accounting, and economics applicable at the village level.

Organization:

Sarvodaya Shramadana Movement operates in more than 5000 villages. It concentrates its activities on rural development. All activities are carried out through 1000 Shramadana societies, village-level autonomous organizations. SEEDS is engaged in rural credit and savings for village development to generate income by managing small- and medium-scale industries, such as printing, wheel chairs, batik exports, light engineering, carpentry, stationery, etc.

Dissemination:

Sarvodaya's pump is based on a design that originated at the University of Waterloo in the mid-1970s with the support of IDRC. The Sri Lankan team has evolved a set of handpumps based on the original design. The SL-6 (shallow wells) and SL-7 (deep wells) are the latest models and are significant improvements over the original prototypes.

Potential users:

Women interested in income generation through marketing of handpump technology, NGOs, and cooperatives.

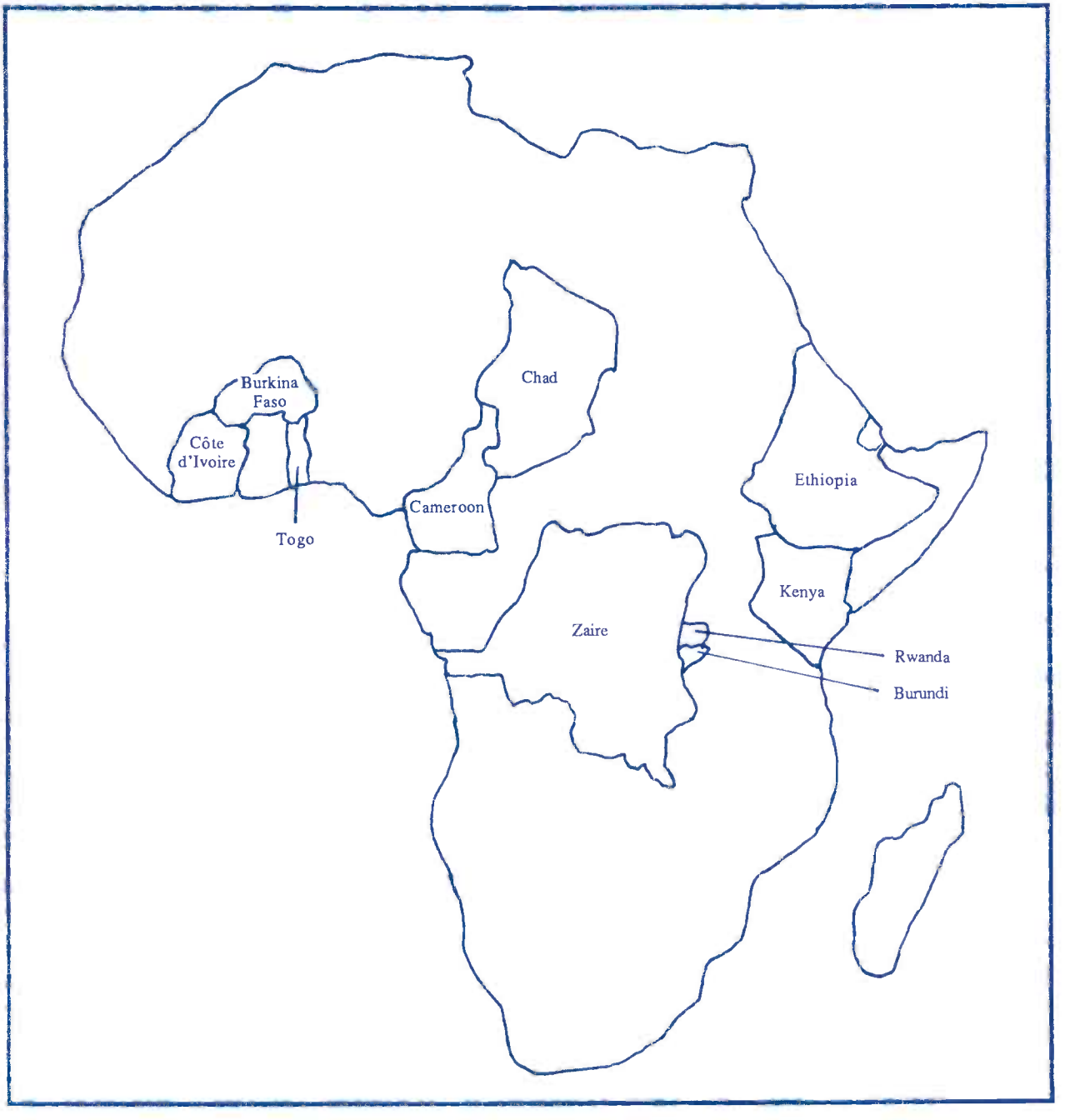
Prerequisites:

Adequate groundwater supplies; willingness of villagers to accept and use the handpump; ability to build, install, maintain, and repair a simple handpump.

Contacts:

- **In Sri Lanka:** Mr Dulan de Silva, Sarvodaya Economic Enterprises Development Services (SEEDS), 26/2 Attidiya Road, Ratmalana, SRI LANKA
  Telephone: (94-1) 71-4577 or (94-1) 72-3597; Fax: (94-1) 72-3091
- **Special note:** The University of Malaya, Kuala Lumpur, Malaysia, is the headquarters of a network in PVC handpump technology that links China, India, Indonesia, the Philippines, Sri Lanka, and Thailand in Asia; Cameroon, Egypt, Kenya, and Mali in Africa; and Costa Rica in Latin America.
  UNIMADE Handpump, Professor Goh Sing Yau, Department of Mechanical Engineering, University of Malaya, Lembah Pantai, 59 100, Kuala Lumpur MALAYSIA
  Telephone: (60-3) 755-3466 Ext. 260 Fax: (60-3) 757-3661; Telex: UNIMAL MA 39845/37453

Rural Technologies Information and Training Services in Africa



INADES, a Pan-African NGO specializing in information and training, has programs in 19 countries and national offices in Burkina Faso, Cameroon, Chad, Côte d'Ivoire, Ethiopia, Kenya, and Zaire. INADES-Formation has national offices in seven countries of Africa. It specializes in the production of print materials in several languages aimed at communities. These materials cover important topics in the life of communities ranging from health to agriculture through community organization. It also offers correspondence courses and conducts seminars in villages.

Rural Technologies Information and Training Services in Africa

Description:

INADES-Formation Cameroon provides information and training in rural areas to both literate and illiterate villagers. Its most popular activities are correspondence courses in agriculture, animal husbandry, and health. It also conducts seminars in villages to discuss traditional and new farming and health techniques and practices.

INADES-Formation Cameroon publishes a lively, popular **magazine**, *Rural Development Review*, in an informal tone that encourages a sense of ownership among its rural readers by speaking directly to them. *Rural Development Review* is complemented by a variety of question-and-answer booklets in French, English, Fee-fe, and Éwondo. A popular radio show, Rural Rendez-vous, reaches a large audience in North-Western Province, solidifying the messages that the organization imparts to its audiences.

Disseminating information is made more complex because, besides the two official languages (English and French), there are close to 200 languages spoken in Cameroon. For this reason, INADES-Formation Cameroon uses Pidgin (the lingua franca of the western and coastal areas) as well as English in its radio broadcasts and publishes materials in French, English, and a few local languages.

One of the strengths of INADES-Formation Cameroon is recognition of the essential role women have in agriculture and development. Their **publications and seminars** acknowledge this by directing specific material to women and seeking information from them. Among major issues promoted are environmental issues such the devastating effects of bush fires and the importance of trees.

Organization:

The Institut africain pour le développement économique et social (INADES) (African Institute for Economic and Social Development) is one of the largest African NGOs. It operates in 18 African countries and has 10 national offices on the continent. Its objective is to educate, train, and sensitize rural people.

Dissemination:

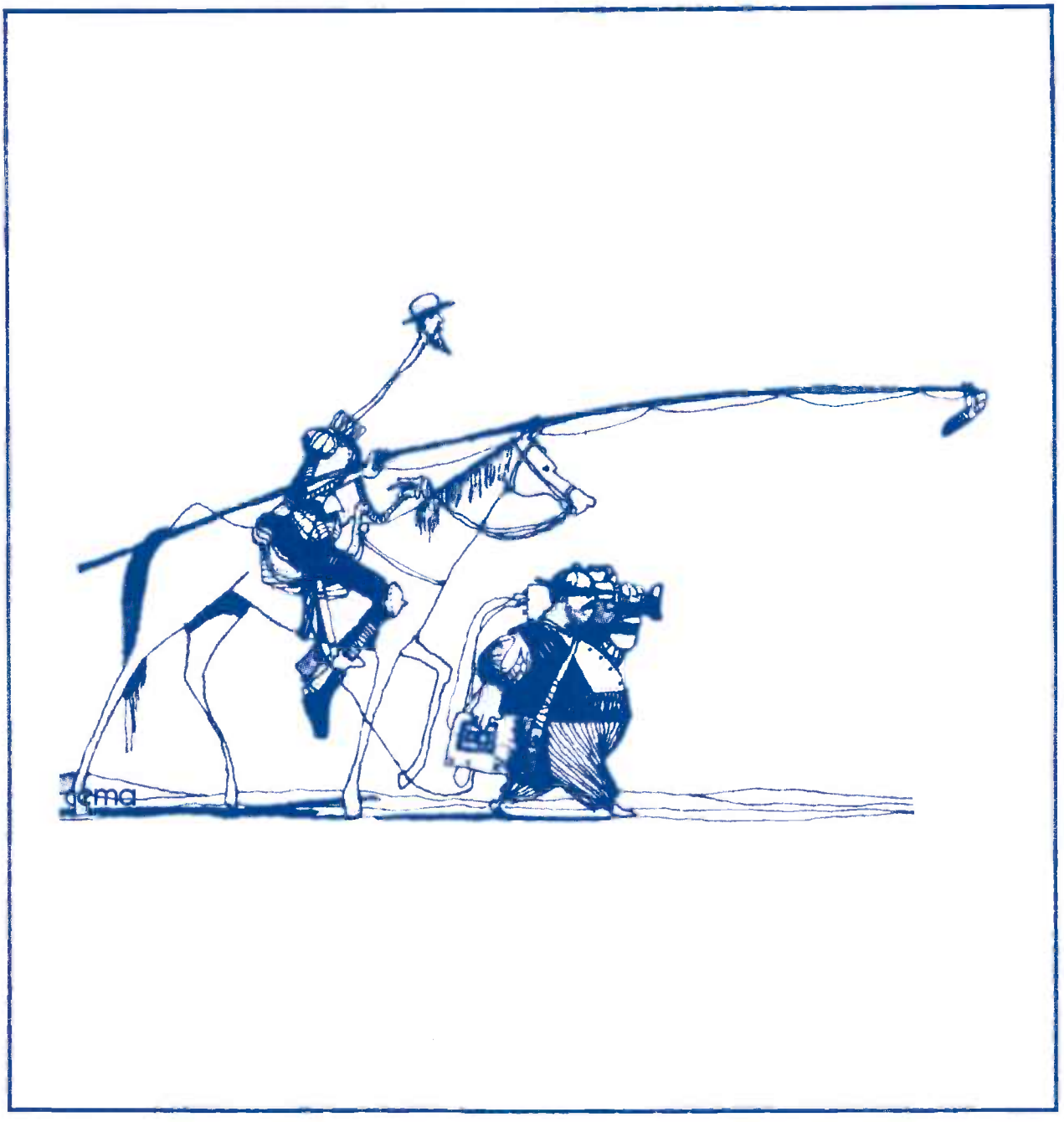
INADES operates also in Burkina Faso, Burundi, Congo, Côte d'Ivoire, Ethiopia, Mauritania, Sénégal, Togo, Rwanda, and Zaire.

Contact:

Jean Baptiste Tandjeu, INADES-Formation, BP 11, Yaoundé, CAMEROON
Telephone: (237) 23.15.51.

18

Trilingual Training Package for Video Production



Several years ago, the Montreal-based Vidéo Tiers-Monde set itself the goal of making a new light video technology available to developing countries as a development tool. Now, their training packages are available in English, French, and Spanish in 17 countries of Africa and Latin America.

Trilingual Training Package for Video Production

Description:

Video has become a new and important tool used by many Third World groups for popular education, information, and training. With portable video, groups now have an inexpensive and manageable medium with which to create their own material according to their own cultural tradition and needs. Lack of or poor training of users of the medium, however, often makes video ineffective.

Organization:

Montreal-based Vidéo Tiers-Monde (VTM), perhaps Canada's most successful exponent of film and video on developmental issues, is collaborating with the Instituto para America Latina (IPAL) on a **trilingual training package** (English, French, and Spanish) for using portable video. Their **self-training package** includes video training cassettes on all aspects of production and distribution. This is supported by three illustrated booklets that also contain technical information.

Dissemination:

The training package has been developed in Canada and Honduras; it was then tested in Chile, Peru, and Zimbabwe, and has been distributed in Algeria, Argentina, Benin, Bolivia, Burkina Faso, Mali, Niger, Sénégal, South Africa, Uruguay, and Zaïre.

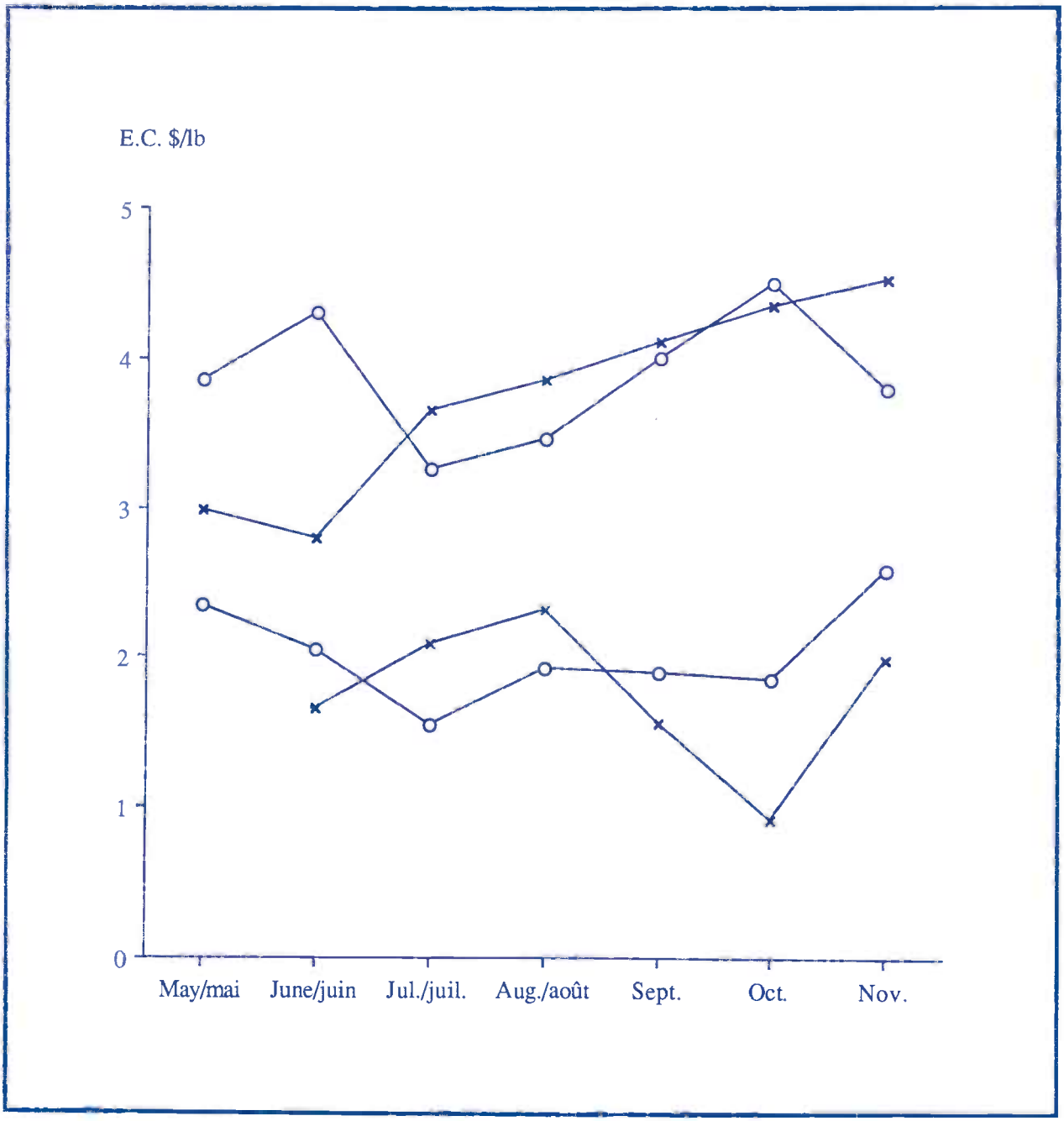
Prerequisites:

Adequate power supply and access to a video unit and a television screen.

Contact:

- **All languages in NTSC standard:** Alain Ambrosi, Vidéo Tiers-Monde, 3575 boul. St Laurent, Bureau 608, Montréal, Québec, CANADA, H2X 2T7
  Telephone: (514) 982-0770; Fax: (514) 982-2408
- **All languages in PAL standard:** Jean-Paul Guillet, OCIC (Organisation catholique du cinéma et de l'audiovisuel) Palazzo San Calisto, 00120, Città del Vaticano, ITALY
  Telex: (504) 2014 C.I. VA OCIC; Tel.: (39-6) 698-7255; Fax: (39-6) 698-7237
- **In Spanish for all Latin American countries:** IPAL (Instituto para America Latina), Ave. Juan de Aliaga 204, Lima 17, PERU; Apartado postal 270031, Lima 27,PERU
  Telex: 25202 PE HCSAR; Cable: IPALC; Tel.: (51-14) 61.79.49; Fax: (51-14) 61.79.49

Computerized Agricultural Marketing Information System



One of the main services provided by the Association for Caribbean Transformation (ACT) is the price forecasting of several important crops for small Caribbean farmers.
The top two lines illustrate the forecast for carrots (o) and the actual price (x) in East Caribbean dollars per pound; the bottom two present the same for okra.

Computerized Agricultural Marketing Information System

Description:

Foreign exchange is being used in most Caribbean countries to buy food that could be grown locally and traded regionally. Information on regionally grown crops, however, is not easily accessible. Another result of this poor flow of information is that few foods are exported, other than the traditional exports of sugar and bananas.

Organization:

The Association for Caribbean Transformation (ACT) is supporting domestic food production and promotes regional trade in Trinidad and Tobago, Dominica, and Antigua in a variety of ways including providing farmers with better market information.

ACT's Agricultural Information System (ACT-AIS) is a **computerized database** that supplies five data modules: commodity prices, input prices, cost of production, demand/supply/production estimates, and trade-related data. At the statistical level, the system provides price forecasts, production plans, market profiles, and trade opportunity identification.

More important, the system uses information technology to support a process of development in which information resources are used to help small-scale producers formulate and effectively execute production, marketing, and trade strategies.

Information is disseminated in the form of bulletins, status reports, and personalized services. To reach small-scale farmers directly, people who generally get their information through institutions, traders, and large-scale farm operators, ACT is developing strategies such as providing speakers on local farm radio shows in Dominica and Antigua and producing fact sheets with large print and more illustrations than normally found.

The data analysis packages help the farmer make decisions by providing information on crops, land allocation, costs, value, sales, and margin. In each country, ACT has supported a system to promote viable, small-scale economic enterprises in the agricultural sector. In Trinidad, ACT has built an effective support complex including marketing, credit, technical assistance, and farm management support to low-income individuals and groups.

Potential users:

- NGOs in the Third World who support productive activities by low-income groups;
- Secondary cooperatives, especially marketing cooperatives; and
- Groups of small-scale agricultural producers with a common production or marketing objective.

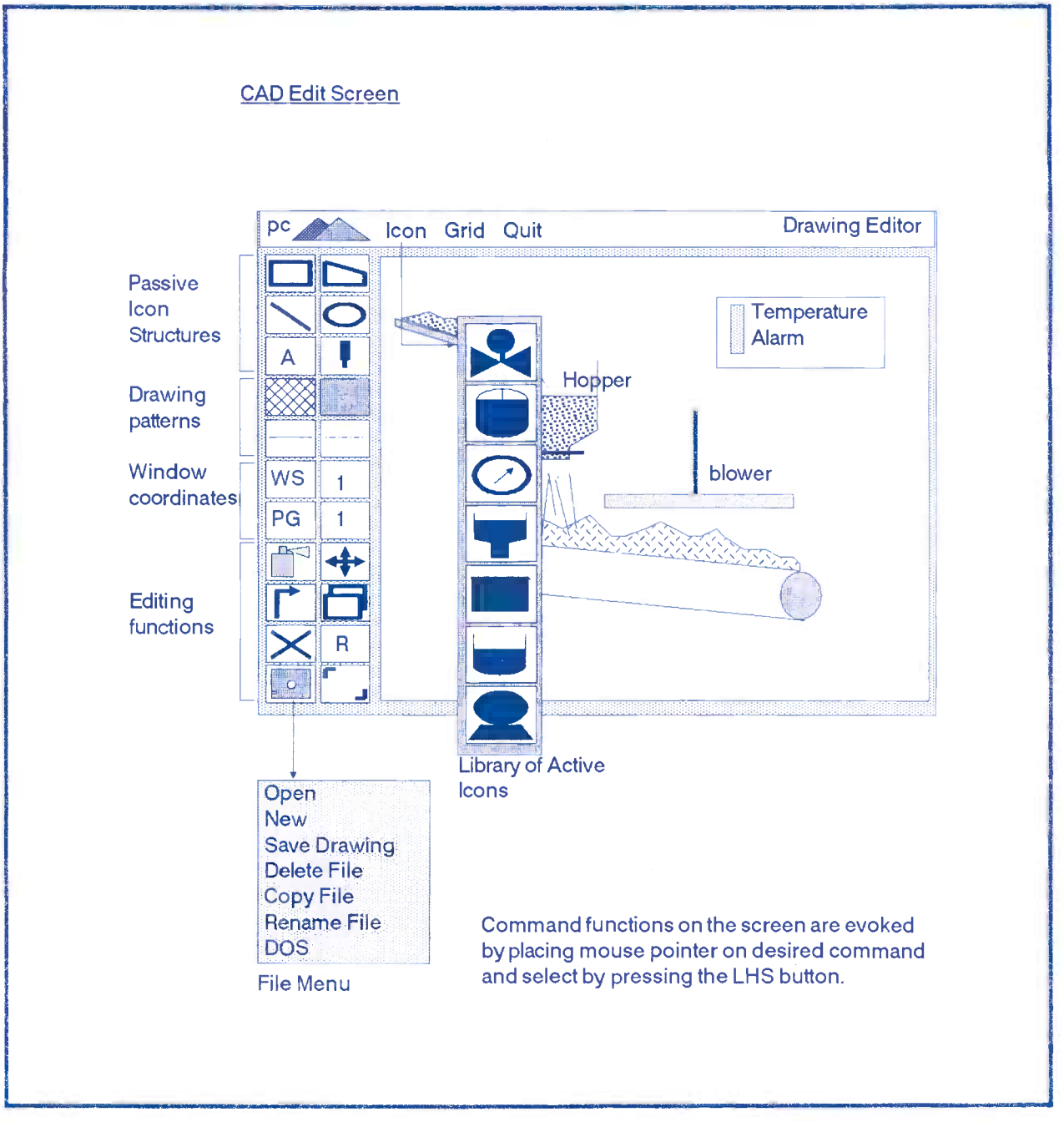
Prerequisites:

An IBM-compatible computer with 640K RAM and database management and spreadsheet programs. A working knowledge of DOS and Lotus 123 is needed. Application of ACT-AIS to agricultural development requires even more knowledge of small-scale production and marketing and the development of a network for accessing data and information being generated within the system.

Contact:

Mr Allan Williams, Project Leader, ACT Ltd, 3 Pelham Street, Belmont, Port of Spain,
TRINIDAD & TOBAGO
Telephone: (809) 624-2142; Fax: (809) 645-0066; Cable: ACTRANS PORTOFSPAIN

Microcomputer-Based Instrumentation for Small Enterprises



The instrumentation software package developed by a team from Singapore and Canada uses icons to simulate industrial processes on a computer screen. The computer is linked to process management modules developed by the same team, which make it possible to control temperature, pressure, flow, etc. This instrumentation package can also be used for teaching.

Microcomputer-Based Instrumentation for Small Enterprises

Description:

The Synapse comprises a hardware–software system configured around an IBM personal computer that broadly has application to laboratory automation and process control. The system integrates artificial intelligence techniques and object-oriented programming methods together with natural language processing at an affordable price.

With Synapse the user can develop a specific monitoring control application without any previous expertise or training in computer programming or electronics. The system is also easy to maintain, which makes it particularly applicable to developing countries.

The microcomputer-based instrumentation was originally developed under an IDRC-funded grant over a period of 30 months. The work started in 1985.

The initial aim was to develop a hardware–software platform based on a PC, considered a cost-effective hardware base around which most commonly used instrumentation systems could be configured and to develop the system for laboratory applications. Later, the objectives were broadened. What finally emerged was a system that greatly exceeded the original performance goals, while maintaining the target cost below US$1000. Among the important technological advances was the development of a new approach to process control and laboratory automation by integrating artificial intelligence techniques, object-oriented programming methods, and natural language processing.

Potential users:

A wide range of industries including metal finishing, aquaculture, environmental control and monitoring, and factory automation. Because of the low-cost of the software, the system is applicable to small- and medium-scale industries.

Prerequisites:

A user should be able to use the Synapse system without previous training. A detailed manual will be provided to guide the user in mastering the system.

The Synapse hardware and software is commercialized worldwide through Eutech Cybernetics. Selected institutional users in developing countries will be given special discounts.

Contact:

Dr Hari Gunasingham, Eutech Cybernetics Pte. Ltd;
1, Science Park Drive #B2-58, Singapore 0511
Tel: (65) 778-7995; Fax: (65) 773-5061

Nontoxic Aquarium Fish-Catching Methods

Fishermen in the Philippines are being trained in the use of nets to capture fish exported for display in aquariums. This technique is now promoted to diminish the use of cyanide poisons that stun fish and make their capture easy but destroy coral reefs.

Nontoxic Aquarium Fish-Catching Methods

Description:

The Haribon Foundation for the Conservation of Natural Resources (the Philippines) and the International Marine Alliance – Canada are training Filipino coral reef fishermen to use fine-mesh nets as an alternative to cyanide. The mesh of the hand-held nets is large enough for fish fry to pass through. This method enables selection of individual fish, leaving other marine life unharmed.

The **2-week course**, to which the entire community (women and children included) is encouraged to attend, deals with proper use of nets, fish habits, reef ecology, diving skills, and handling of captured fish. Fishermen are paid $70 to attend.

Coral reefs around the Philippines are the source of 70% of the world's colourful, tropical marine fish. Cyanide is used to catch about 80% of them. It stuns them and makes the fish easier to catch. But it also kills many fish and shellfish along with their eggs and larvae. Repeated doses also kill the coral that provides food and shelter for numerous fish species, shrimp, lobster, shell fish, and other marine life. Over two-thirds of the coral in the Philippines are damaged. Despite being illegal, cyanide is still used widely by Filipino fishermen each of whom spends more than $300 a year, on average, on this poison.

The coral reef ecosystem is a major source of protein for Filipinos. Healthy reefs produce 35 tonnes of fish per square kilometre each year; deteriorated reefs produce only 7 tonnes. Fish account for more than half the animal protein in the rice-based diet of Filipinos. Reduced food supplies and growing unemployment are direct results of the use of cyanide and damaged coral. The coral reefs also used to be a major tourist attraction.

Damage to the living coral is not restricted to the Philippines, however. It is a major international concern for ecologists who report that it has become a world-wide problem.

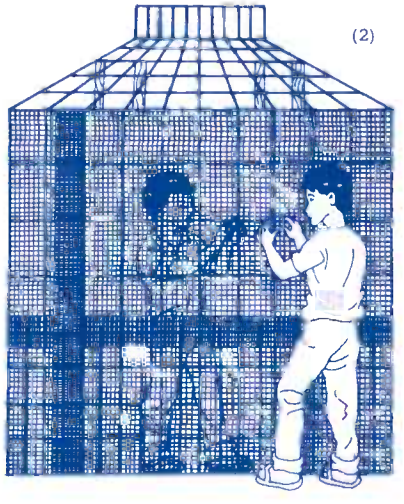
Potential users:

Communities that engage in aquarium fish catching in the Philippines, Malaysia, and other regions where there are coral reefs.

Contact:

Dr Don E. McAllister, President, International Marinelife Alliance Canada, 2883 Otterson Drive, Ottawa, Ontario, CANADA, K1V 7B2
Telephone: (613) 992-0499 (day) and 731-1755; Fax: (613) 996-9915

Ferrocement Technologies for Village Use



Ferrocement has a great variety of uses. This illustration is taken from a manual published by the Capiz Development Foundation (Philippines) that explains how to build ferrocement rainwater catchment reservoirs.

Ferrocement Technologies for Village Use

Description:

Ferrocement is a relatively simple material that uses a mix of Portland cement and an aggregate of either sand or stones in conjunction with wire netting or other solid reinforcement (bamboo). This material is already in use for storage of drinking water in cisterns, irrigation canals, and storage tanks for hospital wastes. It is less expensive than other means of construction and is readily available. Attempts are being made to promote its use for housing and silos for grain storage.

Organization:

- The International Ferrocement Information Centre (IFIC) at the Asian Institute of Technology (AIT) was established in 1976 to ensure transfer of ferrocement technology, which has wide application in rural areas of the developing world. Training methodologies have been tested on how to instruct people to teach and use this technique. Ferrocement technology training is complemented with publications in local languages that are adapted for use by villagers. IFIC has agreements with 141 universities in 50 countries to teach ferrocement technology. IFIC also created 50 reference centres in 32 countries and is initiating another 30 new reference centres.
- A **Ferrocement Information Network (FIN)** was established in 1985 to facilitate and accelerate the flow of information among ferrocement users in developing countries. FIN membership includes five Middle East and Asian countries. Both scientists and users in the developing world have benefited from that transfer of technology.

Dissemination:

Major countries where the technology is applied include India, Indonesia, Malaysia, the Philippines, etc. (more than 50 countries).

Potential users:

- Villagers, technicians, local workers, and low-income groups;
- Scientists and engineers who can access: specialized bibliographies, ferrocement abstract series, directories, computer software for the design of ferrocement structures (water tanks, roofing elements), newsletters, brochures, audiovisual materials, and reference centres.

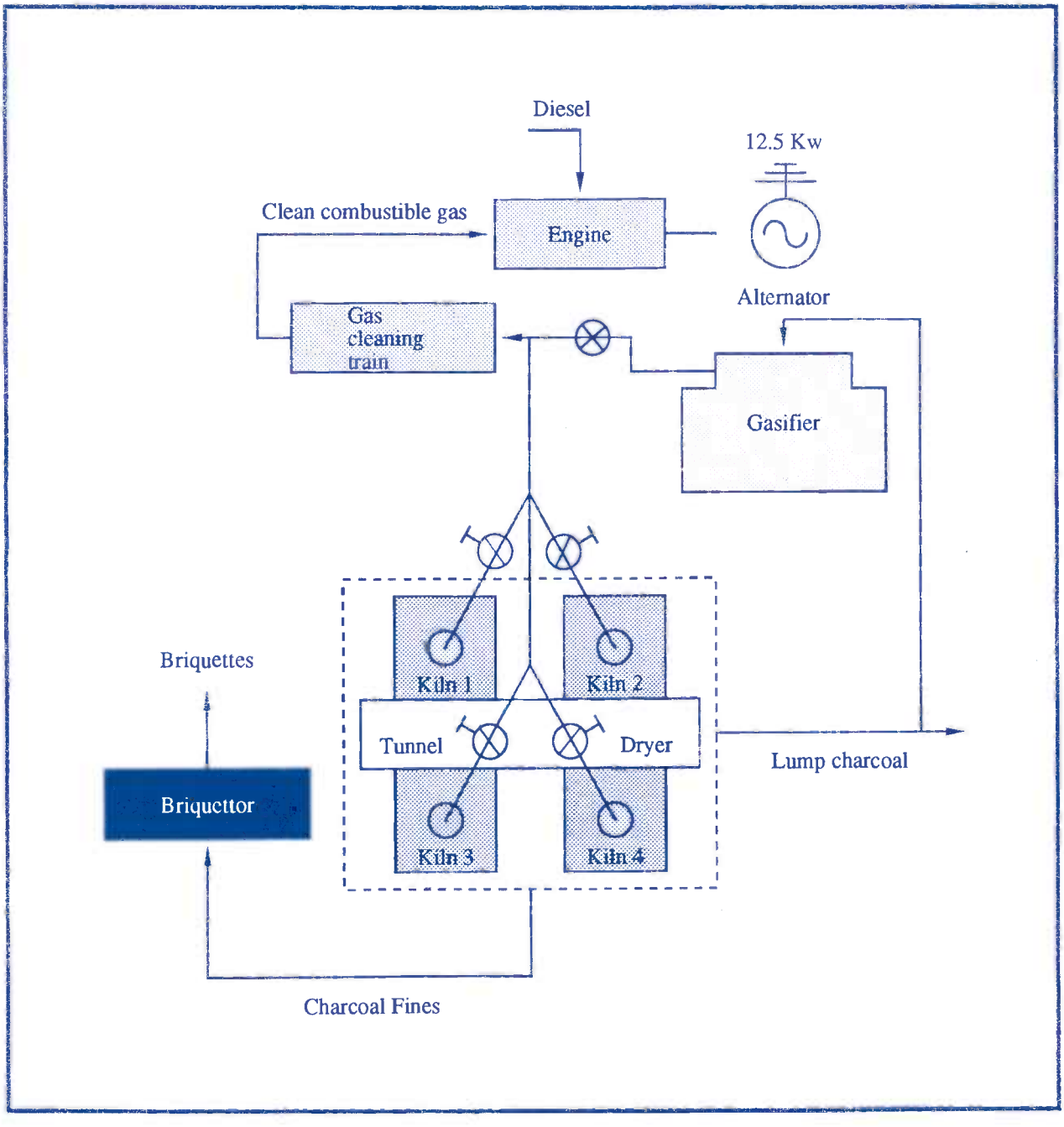
Prerequisites:

Adequate supplies of cement, aggregate, and reinforcement. The technique is easily explained by demonstration, in pamphlets, and videos.

Contact:

Arthur Vespry, Director, Library and Regional Office Centre, IFIC/Asian Institute of Technology, PO Box 2754, Bangkok 10501, THAILAND
Telephone: (66-2) 529-0900-13; Telex: 84276 TH; Cable: AIT Bangkok; Fax: (66-2) 529-0374.

Integrated Wood-Based Energy System



This integrated energy system can make 200 tonnes of charcoal from 2700 m^3 of wood. Besides the wood, the only other input is diesel fuel needed for an electric generator that runs on a dual system of 50% fuel and 50% kiln-off gas. The other main components are 4 charcoal kilns (7.5 m^3), a gas cleaning train, and a charcoal gasifier (used when kilns are not operating).

Integrated Wood-Based Energy System

Description:

In the Philippines, a small-scale (or simplified) industrial energy method has been developed to provide a **village-level energy system** that draws on the tree farm. The technology centres on a charcoal-producing kiln. Waste gases captured and suitably cleaned run a power generator.

In a first system, four sets of charcoal kilns are used to generate the combustible gases. The second system adopts a biomass pyrolyzer method that produces combustible gases on a continuous basis. Both systems are backed up with a gas cleaning and cooling train and an electric generator run off a diesel engine.

The setup also generates byproducts such as better-quality charcoal, wood tar, and heat energy to operate a dryer. Ashes from the kilns are used as fertilizer. The system can also be adapted to run small buses, fishing boats, rice threshers, irrigation pumps, and small ice plants.

Demands for energy in remote areas where electricity is unavailable and where costs of other fuels are too high invariably mean that wood is resorted to — either as a fuelwood itself or to make charcoal, both of which are wasteful, costly, and environmentally degrading. Charcoal kilns also cause serious air pollution. By establishing tree farms (using fast-growing *Leucaena* species) and banning the use of fuelwood and other large diameter wood species for charcoal production, the Government of the Philippines has reduced deforestation by people living in isolated communities.

Potential users:

Communities in remote regions not serviced by even decentralized power generating; small businesses or government services, such as rural hospitals and clinics, and villages requiring a reliable, low-cost energy system.

Prerequisites:

- A readily available market for off-kiln gas;
- An established source of agricultural and forestry wastes to supply the system; and
- Available technical support to operate the system.

Contact:

Dr Emmanuel D. Bello, Director, Forest Products Research and Development Institute (FPRDI), College, Laguna 4031, the PHILIPPINES
Telephone: (63) 2377; (63) 2586; (63) 2360; Telex: 40860 PARRS PM; Fax: (63-2) 822-1254 c/o Rene Olegario

Education Materials for the Consumer

The Consumer Association of Penang is one of Southeast Asia's most active consumer groups. Among their numerous activities, they publish a variety of pamphlets on safety at home, environmental pollution, good spending habits, and on how to read advertising copy intelligently, as shown on this page taken from their brochure "Advertising: The Price You Pay."

Education Materials for the Consumer

Organization:

The Consumer Association of Penang (CAP) does grassroots environmental and development work linking consumer issues with development issues. It has produced many **education materials** and held workshops, seminars, and rural information programs. For programs in rural areas CAP produced four-page brochures consisting mostly of sketches and using few words. CAP is helping people to become more responsible consumers and it is also helping to protect them from marketplace malpractice and abuse.

CAP is currently producing a series of pamphlets with detailed information and analysis for use by teachers, women's groups, university students, youth leaders, and workers. The pamphlets will be used in teacher-training courses to help in the teaching of "life skills" — what to buy, spending and saving, health, nutrition, and safety — and as resources for consumer clubs in schools.

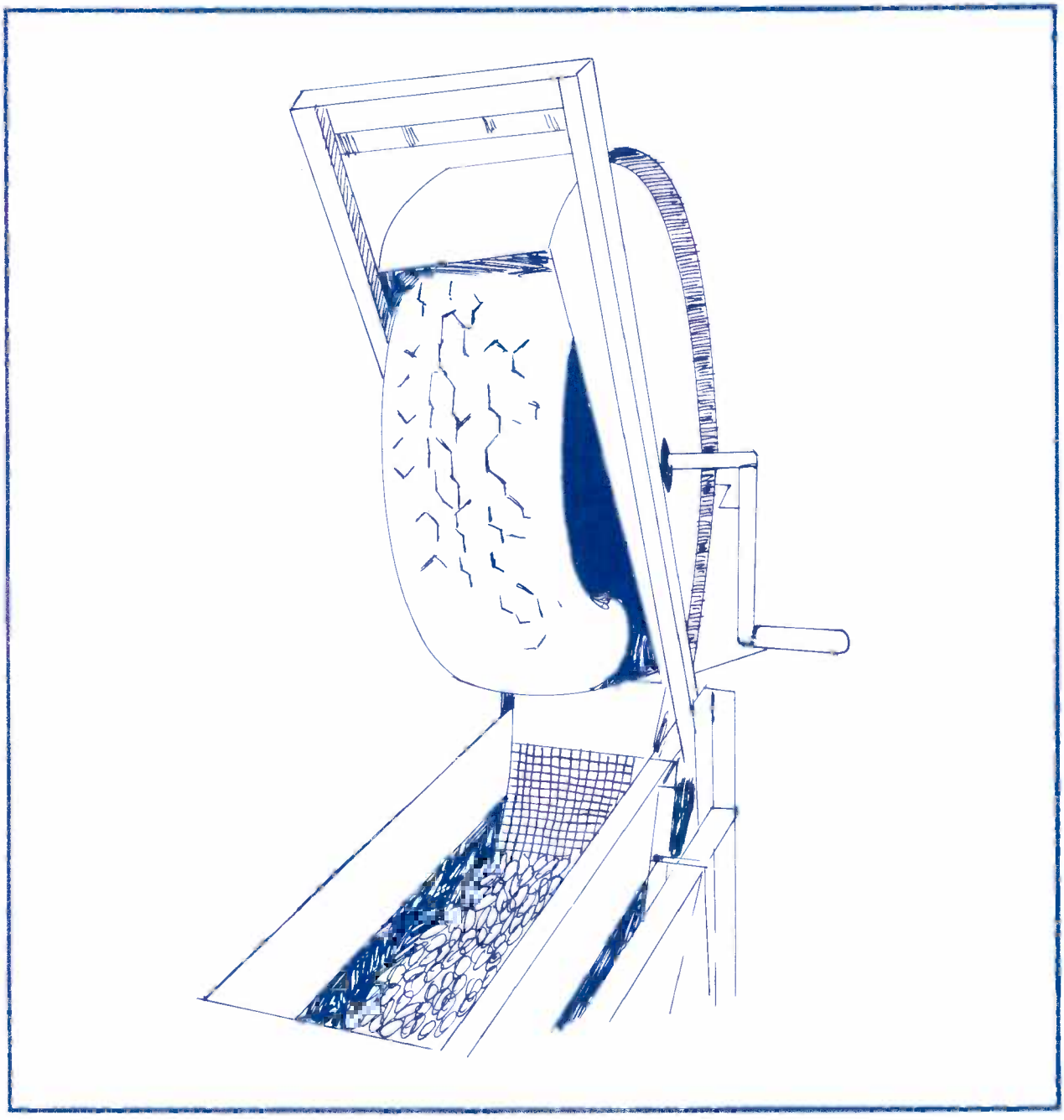
The pamphlets are printed in English, Chinese, Malay, and Tamil. Among the titles and topics included in the series are:

- Safety at Home, at Work, and on the Road;
- Advertising: The Price You Pay;
- Protect Your Money;
- Sugar Destroys Your Health;
- Consequences of Pornography;
- The Third World Environmental Crisis: A Third World Perspective;
- Be Healthy: A CAP Guide for Malaysian Women;
- Good Nutrition, Good Health;
- Product Safety for Women;
- Public Services;
- Complaints;
- Breast Feeding: The Best Start in Life.

Contact:

Martin Khor Kok Peng, Research Director, Consumer Association of Penang, 87 Cantonment Road, Penang, MALAYSIA
Telephone: (60-4) 37.35.11 or 37.37.13; Telex: 40989 CAPPG MA

Mechanizing Peanut Production



The main component of the peanut dehuller invented by Winit Chinsuwan, from Khon Kaen University, is a recycled tire. When the machine is closed, the tire crushes the peanuts against a grid. Such peanut dehullers cost about $100.

Mechanizing Peanut Production

Description:

Groundnut farming is one of the major cash crops in Thailand. Thousands of Thai farmers in the northern, northeastern, and central plains regions work farms of less than 1 hectare in the upland areas during the rainy season and in the irrigated areas after the rice harvest. The crop is an important cash producer for the farmers.

Traditional groundnut cultivation, however, is an intensely manual process requiring substantial time for land preparation; seed preparation; planting; cultivating; harvesting; and drying, dehusking, and cleaning for marketing purposes. All of these are constraints to increasing production.

The mechanized groundnut (peanut) shellers and strippers benefit farmers by reducing both time and processing costs. In the Thai villages where they have been introduced, in the area of Khon Kaen in the northeast, a new cottage industry has developed. The households now produce roasted peanuts and ground peanuts used in food preparations. The added income has permitted improvement of their income and the repair of their homes.

Mechanized equipment developed and designed in Thailand to modernize peanut farming is now being introduced in Africa, Indonesia, and the Philippines. The intensive design and improvement work, laboratory testing, and fieldwork came up with a series of manual or mechanically-driven machines for groundnut farming in Thailand.

An information dissemination plan for farmers, extension workers, and traders has also been undertaken in the groundnut-producing regions of Thailand.

Contact:

Dr Winit Chinsuwan, Associate Professor, Dept of Agricultural Engineering, Faculty of Engineering, Khon Kaen University, Khon Kaen 4002, THAILAND
Telephone: (66-043) 241331-44 ext. 1162.1756

Development Data Bases

To nonprofit organizations, the IDRC Library offers access to eight data bases: five international and three in-house IDRC data bases. This service is provided free to more than 120 organizations, users must, however, pay telecommunications costs.

- **ACRONYM**: acronyms relating to IDRC activities;
- **BIBLIOL**: the collection of the IDRC Library;
- **IDRIS** (Inter-Agency Development Research Information System): includes projects of IDRC (names and addresses of researchers, short descriptions of research activities), the International Foundation for Science (IFC), the Swedish Agency for Research Cooperation with Developing Countries (SAREC), the Board on Science and Technology for International Development-USA (BOSTID), the German Appropriate Technology Exchange (GATE), the United Nations University (UNU), and the Japan International Cooperation Agency (JICA);
- **FAO**: documentation data base of the Food and Agriculture Organization of the United Nations;
- **ILO**: LABORDOC data base of the International Labor Organisation;
- **UNESCO**: data base of the United Nations Educational, Scientific and Cultural Organisation;
- **UNIDO**: Industrial Development Abstracts data base of the United Nations Industrial Development Organisation;
- **AID**: documentation data base of the United States Agency for International Development (USAID).

For more information:

Alain Lamirande
Telephone: (613) 236-6163 extension 2417
ENVOY 100: IDRC.DDB
BITNET: IDRC@UOTTAWA.BITNET
Fax: (613) 238-7230

Where to reach us

Head Office (Canada)

IDRC, PO Box 8500, Ottawa, Ontario, Canada K1G 3H9
Tel: (613) 236-6163
Cable: RECENTRE OTTAWA
Telex: 053-3753, Fax: (613) 238-7230

Southeast and East Asia (Singapore)

IDRC, Tanglin PO Box 101, Singapore 9124
Republic of Singapore
Tel: 235-1344
Cable: IDRECENTRE SINGAPORE, Telex: RS 21076
Fax: 235-1849

South Asia (India)

IDRC, 11 Jor Bagh, New Delhi 110003, India
Tel: 61.94.11
Telex: 31 61536 IDRC IN

Eastern and Southern Africa (Kenya)

IDRC, PO Box 62084, Nairobi, Kenya
Tel: 33.08.50
Cable: RECENTRE NAIROBI, Telex: 23062 RECENTRE

Middle East and North Africa (Egypt)

IDRC / CRDI, PO Box 14 Orman, Giza, Cairo, Egypt
Tel: 73.87.60
Telex: DEVCN UN 92520

West and Central Africa (Senegal)

CRDI, BP 110007, CD Annexe, Dakar, Senegal
Tel: 24.42.31
Cable: RECENTRE DAKAR, Telex: 21674 RECENTRE SG

Latin America and the Caribbean (Uruguay)

CIID, Casilla de Correos 6379, Montevideo, Uruguay
Tel: 92.20.43
Cable: RECENTRE MONTEVIDEO, Fax: 92.02.23