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VOL. XVII • NO. 1 • JANUARY 1979

DEVELOPMENT DIGEST

National Pharmacy Association

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1606 New Hampshire Avenue, N. W.
Washington, D.C. 20009

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Use of funds for printing this publication approved by the Director of the Bureau of the Budget June 2, 1966.

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DEVELOPMENT DIGEST

A quarterly journal of excerpts, summaries, and reprints
of current materials on economic and social development

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Gladys St. Phard, Digest Secretary
Prepared by the National Planning Association

for

Agency for International Development, U. S. Department of State

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REACHING THE RURAL POOR



A FARM WOMAN WORKING IN
SOME FIELDS NEAR NALACONDA, INDIA.
(PHOTO: USAID)

Reaching the Assetless Rural Poor

Cheryl A. Lassen

[This study analyzes the way in which economic development and social change can be promoted for the benefit and empowerment of low income rural people: i. e., those who generally have only two resources to rely on--their labor and their capacity for collective action. First, some general principles are proposed; next, six cases of programs for the poor are outlined, and then analyzed and evaluated.]

The assetless rural poor include: landless laborers; marginal tenants or sharecroppers and small subsistence cultivators struggling with insufficient land or the inputs to make it productive; and other kinds of rural people who earn less than a defined minimum income such as petty traders, small artisans, domestic servants, fishermen, etc. Because a major asset these people lack is land, we shall refer to them throughout as the landless and near-landless (LNL). Specific criteria to measure the numbers of landless and near-landless may be debated, but clearly some combination of assets, income and access to services should be considered to identify persons whose situation is so adverse that it warrants special attention. A recent survey by the Rural Development Committee at Cornell University of available data for 17 countries in Asia and Latin America indicates that in the majority of these countries, some 65 percent of rural households were not earning "basic minimum incomes." If anything, trends in the marginalization of rural people were found to be increasing.

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Strategies for Attacking Rural Poverty

Economically oriented recommendations for dealing with the LNL have centered around creating employment in rural areas, and have emphasized the need to raise the production of the LNL, increase their skills, and increase their demand for goods and services which in turn raises demand for what the LNL can produce and thus for their labor. These are certainly necessary methods for reducing poverty. They have been criticized as being insufficient, in part because measures to implement these economic strategies in particular situations have often not achieved intended results, and have produced more benefits for the rural rich than the poor, which reinforced skewed distributions of income, assets and other forms of power. An alternative strategy, the "basic needs" approach to development, gives top priority to meeting the needs of the poorest people as an end in itself; but there is no agreement on how this is to be achieved.

A major theme in this study is the need for "increased participation" by the LNL in the development projects that affect rural areas. There is now a widespread consensus on the general virtue of participation; what is needed is closer analysis of this concept to see which forms of participation benefit which groups or classes in the development process. I would include the following: LNI participation in the implementation of a service or project; participation in the decision-making on what that service or project should be; participation in evaluation of the performance of project administrators or quality of service; and finally, participation in control over how the project or service is directed in the long run.

Participation only in implementation and benefits is compatible with a "welfare" approach to extending social services, i. e. gifts in a spirit of charity to passive, inferior recipients. Can such limited forms of participation produce structural changes in the circumstances and capabilities of the LNL? With top-down approaches which allow little or no room for effective LNL participation in decision-making, evaluation and project control, can people ever develop the skills and political voice to decide and manage their destiny? Can their development really come about? These questions are likely to remain in some dispute, no matter how much evidence is produced for one side or another. We note, without claiming that the argument is conclusive, that the unsatisfactory experience with conventional development approaches seems enough to show that some kind of alternative approaches are warranted if one is serious about wanting to reach the most disadvantaged rural poor. Some change in their social

and political conditions is needed along with new economic opportunities if lasting improvements are to be achieved on their behalf--at least this is the premise followed in this study.

The goal of achieving structural change for rural workers makes single sector or single program approaches to the LNL inadequate in most cases. As an example, one public education program in Colombia travels to plantations to instruct migrant workers in literacy, hygiene and better ways to perform their work. But what is accomplished by showing a migrant worker better ways to pick cotton if the factors that determine his wage and working conditions remain virtually unaffected by this program? Broadly defined rural development programs which include motivational, educational, organizational, cultural and technical components are more likely to affect structural change in favor of the LNL.

Adopting a broad multi-faceted approach to rural development is not enough, of course. To be successful, a strategy for attacking rural poverty must be realistic in terms of costs, and it must have a way of resolving implementation problems that have prevented other approaches from having a developmental impact on the poorest of the poor. The question of costs could indicate an approach that elicits a large amount of voluntary local labor, and it also seems likely that costs could be reduced by local initiative in problem solving, and local responsibility to maintain assets once they are created. If this is valid, then an approach which stresses popular participation in decision-making and control appears necessary to achieve structural change at a cost per unit low enough that such processes can spread to encompass large numbers of people. Only with such participation can a large portion of the resources necessary to carry out a widespread attack on rural poverty come in a noncoerced fashion from local people themselves. In designing projects as part of a strategy for sustained and effective development, we should seek to mobilize local people for their own advancement. The role of public goods and services would be to break strategic bottlenecks so as to further self-actualizing processes, but not to set up a centralized system that tells people what to do or makes them dependent on government resources to carry things out.

Some may object that this approach puts the burden of development on the poor, or that as a strategy it will contribute to uneven development because those who possess some resources will have more to contribute to their own improvement. A consideration of past experience suggests that projects in which

serious consideration was never given to self-reliance were often characterized by problems with chronic dependencies and underdevelopment. In all but the most deprived cases, the poor have some resources; and there are major advantages to emphasizing self-reliance--apart from lower cost to aid donors--in fomenting sustained and effective development for the poor. Developmental assistance efforts by governments or foreign donors may have to be more compensatory toward poorer communities or groups. But we are convinced that the context and philosophy of such efforts must be those of promoting self-reliant development.

Reaching the rural poor. Why has it been so difficult for public programs to have a developmental impact on the LNL to date? Central governments operate at several disadvantages when they try to move public goods and services down to the local level to benefit the weakest sectors of the community. The first of these disadvantages is that their system of administration often does not reach effectively much below the district level. When it does, this is usually done in a single-point fashion such as the introduction of a new seed variety, a new road, a visit by a public health worker, etc. This has two weaknesses in terms of LNL development. 1.) Public inputs are frequently made without much knowledge of or concern for the local resource base. Instructions originate from those farthest removed from the field and flow with little or no modification enroute. In the interests of uniformity in operations, and speed of implementation, little thought is given to how to tailor programs to local conditions. 2.) The delivery of public goods and services tends to be controlled by the technical departments of government ministries. Those working in research stations and technical departments have become accustomed to what amounts to lead roles in policy formulation, thereby strengthening purely technical approaches to the problems of the poor.

When it does not reach directly to the local level, the central government frequently works through intermediary agencies, such as banks that distribute agricultural credit, or associations that provide services to farmers. The idea is that local people will make use of these intermediary agencies to obtain the specific, technically defined and allocated goods and services of the government. A major difficulty of this approach is that all local people do not have equal opportunity to use intermediary institutions, either directly or through organized groups. On the contrary, what we see happening are local elites who possess assets or political power (often both) gaining preferential access to these intermediary institutions, and thus consuming the lion's share of public goods and services allotted to the rural sector.

When public administration does not reach down to the local level in ways that can support structural improvements for the

rural poor, either directly or through intermediaries, how can the LNL be formed into clientele that can effectively seek public goods and services? Is there some way to utilize catalyst agents who can help organize the LNL and act as their intermediary until such a time as the LNL clientele are able to compete with advantaged local individuals and groups, or else are accepted by and allied with local elites?

The role of the catalyst agent. The role of such a catalyst agent would be to bring public agencies into greater awareness of the requirements of the LNL clientele, and to aid the rural poor in acquiring public goods and services, as well as enhancing their self-help capabilities. One may project the following general characteristics for catalyst agents: 1. Catalyst agents convey a philosophy of planned change which goes beyond single sector programs and economic activities. It involves a commitment to increase productivity and employment, and to promote greater equality and self-reliant decision-making. 2. The catalyst agent is a mediating agency between the state, the economy and the LNL, facilitating a more productive exchange of information, understanding, and goods and services. 3. Catalyst agents coordinate services coming down to the LNL at the local level. 4. They can provide research and design assistance to local project activities that serve to gain local participation and support. 5. Catalyst agents recruit and train "cadre", i. e., local leaders. The catalyst agent identifies persons who have LNL confidence, encourages them to see larger issues and developmental possibilities, and assists them in working out strategies of local improvement. 6. Catalyst agents initiate (if necessary) processes to help the LNL to act as a group for their own improvement.

Potential catalyst agents exist in a large variety of forms and sizes. They may be large organizations with widespread international activities, or smaller institutions, or even individual advisers or activists. They may be foreigners or nationals of the country of their activity; their funds may be from governmental or from private (including religious) sources. From our standpoint their identity is much less important than what they do: to become catalysts, the agents must actually produce developmental change among the LNL.

Social technology for socio-economic change. Some may look at the participation in group action simply as a matter of individual choices: if the right incentives are provided, a person participates; and if disincentives exist he does not. From this point of view, participation is mostly a matter of correctly manipulating incentives. Many policy makers have this perspective in distributing public goods and services. However, the LNL have inferior mobility and institutional access, which places special barriers to

many activities. For them, participation is not possible as a response to a few standardized incentives. Appropriate organizational techniques need to be adapted to the circumstances and needs of the target group. These are what we refer to here as "social technology".

The "consciousness-raising" methodologies of Ivan Illich and Paulo Freire have been concerned with building up the self-dignity and decision-making capacities of poor people in environments that may be highly stratified, exploitative, and/or culturally repressive. Men and women are encouraged to view themselves as active, creative subjects with the capacity to examine critically, interact productively with, and transform their natural and social environments, rather than accepting existing practice or authority. Freire in particular emphasizes a deliberate self-questioning process to seek alternative courses of social action. It is essential to his methodology that the search for solutions be initiated from within a group so that their capacity to make decisions and reach a consensus for collective action is enhanced.

It is important to distinguish this kind of approach from those which have only the trappings of "participation" as the word is used here. It may appear that because a program is decentralized and has a strong extension component, it is therefore participatory. But decentralization of authority from central to local levels does not result in participation unless there is also a sharing in planning, decision-making and evaluation within the local group. With some traditional approaches, the sponsoring institution adopts a paternalistic role. The program per se becomes the focal point, as against the development of the people which the program was ostensibly organized to serve. Consider the Puebla Project in Mexico: the object of this program was not so much to improve the situation of subsistence farmers as it was to get high adoption rates of HYV (high-yielding varieties) of corn on very small farms, thus demonstrating that HYV technology was "neutral" to land scale. HYV varieties were introduced with little concern for the inter-cropping of other food staples like beans or squash. The new varieties required much more labor, and many households found that those labor demands conflicted with their need to earn income off the farm.

In contrast, a catalytic approach should emphasize the community, its people and their involvement as focal point for change. This excludes making decisions within an implementing agency and then using money or social coercion to make local people acquiesce to what has been decided for them. Instead, non-formal educational techniques should be emphasized; these will allow people to define their problems, examine them, and decide on a basis for problem resolution. Such methods can include giving people appropriate

technical information they may need to make decisions, but the learners remain the decision makers--the people are to come up with the answers, not the teacher.

Among programs that stress self-direction and group action, there seem to be two types. One is more oriented to fostering self-help and mutual aid, striving for a relatively harmonious increase in assets and skills. The other type is more oriented toward confrontation with local elites, government agencies or other holders of power. The confrontation approach may not seek violence; but it will make people more aware of differentials and abuses in power, and it explores direct ways of changing domination patterns. An important objective of the confrontation approach is to create greater group solidarity and capacity to act as an effective pressure group. Such a strategy may tend to downplay activities that emphasize individual opportunities or development along non-egalitarian lines.

The self help and confrontation approaches are not necessarily opposite forms of community organizing. The former may be the antecedent of the latter in the first stages of group action, or when people lack a clearly focused opponent or issue of contention. The latter may, on the other hand, give impetus to people for group efforts which, once authorities become more accommodating, can be cooperative in nature.

Case Studies of Efforts to Assist Development Among the Assetless Rural Poor

This section presents a brief outline of six projects which have dealt with the LNL--some very successfully, others less so. Only a small amount of information is summarized for each example. More details will be introduced about these cases in a subsequent discussion of the techniques involved, and of the ways in which these projects have or have not resulted in structural change which favors the LNL.

The BRAC Sulla project. The Bangladesh Rural Advancement Committee (BRAC) began, in 1972, in several thanas of the Sylhet district, a program to improve the economic situations of rural families: to provide health care, build local organizations, and expand educational opportunities. At that time the war for liberation had left hundreds of thousands of families disrupted, people wounded, and thousands of homes demolished; floods followed, food was scarce, and famine threatened. The first phase of BRAC's work was devoted to relief, mostly in feeding and helping villagers build shelters and homes. Eventually BRAC entered a second phase of integrated rural development, which it imple-

mented in the Sulla thana and elsewhere ("thana" is a local government unit).

BRAC field workers living in base camps near the villages planted demonstration gardens using modern seeds and techniques. Thirty one paramedics were trained to diagnose and treat the twelve most common diseases in the area and started making regular visits to some 220 villages. Through food-for-work programs, embankments, dykes and irrigation canals were constructed to stem the recurrent flooding. Initially BRAC simply started up projects in agriculture, education, health, etc. without any planned relationships among them. Later, BRAC decided that the way to achieve integration of its activities was to strengthen the educational component of its program and make it more relevant to other program activities. An effort was made to redesign learning programs and materials; literacy classes for the villagers were combined with discussion and instruction in family planning and sanitation, health and nutrition, agricultural practices, undertaken in light of the villagers' practical knowledge of what kinds of reforms or innovations were needed and feasible. BRAC also stresses the building of community organization, primarily by pressing for the construction of community center buildings in each of the "townships" where it operated.

When BRAC conducted an evaluation of the economic impact of its programs after four years in Sulla thana, it discovered that the local people who had the greatest involvement in decision-making and who benefited the most from BRAC services were the larger landowners. The construction of community center buildings really had meant little for participation by the LNL. In Phase III (1977), BRAC therefore decided to re-orient its activities to reach the poorest of the poor more effectively. It began to recruit and train youth groups to undertake projects in their villages; it also began to train local para-professionals, especially women, in health care. Its educational program shifted from literacy courses to functional education for non-literates tied into economic activities which stress joint savings and cooperative farming ventures among the LNL. There is also some "consciousness-raising" about common problems and possibilities for collective action to resolve them.

Ayni Ruway, cultural and economic development project in Bolivia. The motivating force behind this project is the struggle certain Indian people have been waging to preserve their indigenous values, language and culture as it comes into contact with a central system that is perceived as Spanish-speaking, capitalist, and hostile (i. e. Quechua Indian people have been regarded as

racial inferiors). The purpose of this movement, then, is to raise peoples' self-esteem through appropriate forms of social communication (see Development Digest, October 1978, pp. 57-9). The project began in 1974 with two communities in the Cochabamba region of Bolivia. A community cooperative was set up and stocked with goods which the member communities produced. At first these were sold by the cooperative at conventional market outlets, and the cash was used to buy manufactured goods not available through local production; later products were increasingly exchanged for goods from cooperatives in other communities.

From two communities servicing 600 people in mid-1974, the number of cooperatives grew to 58 servicing 14,000 people in various areas by 1977. This barter system allowed the communities to specialize: one place produces ceramics, another basic grains, another citrus fruits, another traditional dried foods such as chuno and charqui. Urban areas began small scale production of manufactured goods like noodles, candles and soap to go into the system. Weavers of the Cochabamba area obtain raw alpaca wool from the Altiplano communities further north, which they make into sweaters, ponchos, etc. Income from the marketing of these products is divided four ways: one share goes to the artisan producers; another is invested in product research and design, and in setting up more weaving industries; a third share goes to support the extension and social communication programs of Ayni Ruway; a fourth is used for communal public works.

In addition to the cooperatives, 22 community centers (Ayni Wasis) have been established. These centers are the heart of this social movement. In addition to disseminating new information and maintaining the organizational infrastructure, the Ayni Wasis are centers of theatre, puppet shows, radio programs and journalism which build peoples' cultural self-esteem and help them identify kinds of collective action they wish to undertake. The Ayni Wasis are also non-formal education centers and local decision-making councils; their leaders are the cadre of the movement.

The Social Work and Research Center (SWRC), India. The SWRC was begun in 1972 by a group of urban university graduates in the very poor, semi-arid state of Rajasthan. Starting with expertise in three areas--water, medicine and education--its purpose was to implement economic and social development activities for the lowest income people of the Silora Block of the Aymer district, Rajasthan (about 80,000 people living in 110 villages). The somewhat unusual characteristic of the SWRC is that it had no fixed plan of action, no time schedule, or rigid bureaucratic hierarchy. Its goal was to promote a "bottom-up"

development process where local people would control their activities and use the SWRC as a resource center for problem solving.

After three years of SWRC's loose management model, both the water research and development program and the dispensary services of the SWRC had achieved substantial successes in serving large numbers of people. The SWRC had also shown its versatility by working with all levels of public agencies ranging from the block to the national level, and with domestic and international private voluntary agencies as well. But little progress had been made in forming active partnerships with local people and in developing with them self-help programs. The biggest initial difficulty was the fragmentation of villages into separate caste groups in a hierarchy of prestige and power. This interfered with cohesive village-wide institutions, and with planning and decision making processes that could serve as structures for local development. People still came to the SWRC campus for extension, craft training or other services, but the program did not reach out into the countryside.

To accomplish the latter process, the SWRC began after 1975 to move its medical programs out into the villages; to make a more focused effort to reach the poorest strata; and to change its educational programs to meet their training and leadership needs. Its health program shifted from curative to preventive medicine and village-level health workers. The SWRC provided training and the medicines that the local paramedics and midwives were allowed to administer, but the villagers themselves paid the salary of their health workers. A challenge for the SWRC has been how to relate their water development program to the LNL. The SWRC has also helped the harijans (the lowest castes) reclaim land, find water and improve their agricultural technologies. In addition, the SWRC has helped improve leather tanning technology to produce a product which is finished enough so that the womens' craft cooperatives can use it. (Leather work is a traditional harijan occupation.) As market outlets and product designs have developed, the SWRC obtained a loan from the Bank of India and set up a revolving credit fund so that artisans could establish cottage industries in their homes.

MARSILA: a rural pressure group in the Philippines. This is a case of subsistence cultivators who squatted in the 1950s on frontier land designated as a federal forest reserve on the island of Mindanao. The reserve covered 6,600 ha. and had numerous squatter communities farming within it. As the surrounding municipality became more populated and commercial farming interests entered the area looking to obtain land, efforts to dis-

place the insecure settlers increased. In 1969, corrupt forest rangers extorted chickens, rice and other products from the settlers with threats of eviction. In 1972 the mayor of the nearby municipality threatened to demolish the settlers' houses. In 1974, boundary markers suddenly appeared all over the reserve without the local residents knowing what they were for, and the mayor announced that they had six months to vacate the area. At this point, people of three of the barrios of the reserve appealed to a local priest for help. He in turn put them in touch with experienced community organizers.

A group of 30 farmers traveled to the provincial capital to inquire about the status of the lands with federal officials. They learned that the lands were still classified as a federal reserve area. With this information, 300 people from the barrios marched on the municipal hall to confront the mayor and inform him that he had no authority over the reserve lands. After this first experience, the people decided to stay together and pressure the system to obtain legal rights to the land. It took them several months of barrio meetings before finally electing a steering committee which began filing petitions with federal government agencies to obtain titles. When the government came to survey the land in response to the settlers' petitions, the loose inter-barrio organization acted effectively once again to settle land disputes before they were elevated to the courts, where disputes would only cause more problems and delay. Settling the boundary disputes proved to the people that they could make honest and fair judgements, and carry them out themselves. The fame of the MARSILA experience spread, and soon they were showing other barrios in the reserve area how to petition for titles.

The MARSILA mobilization went beyond land. In a political environment where almost every poor person feared a police figure, the MARSILA group set a precedent by filing a protest with the district police commissioner against an officer's taking goods from stores without paying. When a bus killed a local teacher and the bus company refused to be responsible, the MARSILA barrios picketed the bus station until a suitable indemnification agreement was reached with the family of the deceased. The women of the MARSILA barrios became active in issues concerning nutrition and community health. For example, when refused services by a government clinic, the women persuaded a Catholic hospital in the region to send a health team. In four years of applying pressure, MARSILA has still not obtained legal titles to the reserve lands. However, two new sugar plantations have been started nearby, and it seems likely that without the organization of the barrio people their land would have been taken by these plantations. Even if the bureau-

cratic process is slow, the MARSILA people are determined not to be evicted from the land they consider rightfully theirs.

The Salvadorean Communal Union (UCS), El Salvador. El Salvador has a serious agrarian problem with a growing population and severe land scarcity. Consequently the plantation sector and the LNL have come into frequent and jostling contact with one another. In this situation, the Union Communal de Salvador (UCS) has been an invaluable mediating agent between the LNL and the power structure. Basically it has organized the landless to rent or purchase land collectively, while at the same time it has acted as a pressure group in the national political arena to improve the legal terms on which this could be done. The UCS not only collaborated with the government in rewriting tenancy laws, but it has also brought many test cases into the courts to strengthen the enforcement of those laws. The UCS has been a kind of private land reform agency, providing beneficiaries with production credit, a machinery pool, extension service, and organization that has a lot of grassroots enthusiasm and support. Because of its commitment to finding non-violent ways of changing the agrarian structure, the UCS has received a lot of support and respect from international agencies, the national government, and even local authorities. The UCS has been highly successful in its political relationships in the first ten years of its existence; it is the only peasant league in all Central America that has been genuinely accepted by governments and landowners as having the legitimate right to be a national spokesman for campesino (peasant) interests. On the other hand, the UCS faces threats to its existence because of financial mismanagement.

Two things brought on the UCS's current financial crisis. One was the willingness of aid donors (primarily international) to give the UCS millions of dollars without making it accountable for how the money was spent. The other factor was the presence of a charismatic leader, who became the caudillo (boss) of the UCS and monopolized significant authority decisions. The money from external donors for which he himself had done the negotiating was easy money; and the international agencies were paying grant monies to the leader personally, not to the national executive committee of the UCS. In this case, a lack of participation in decision-making and project control left the other UCS leaders unable to check the autocratic tendencies of their chief. He himself appears to have been a sincere leader who wanted to help the campesinos, but he came to believe that only he had the skills and ability to resolve problems. Today the top leader no longer has any control over the finances of the organization, although he still has considerable influence from his control of the UCS's Multiple Service Cooperative (the equipment pool).

But the UCS's ability to serve the LNL's has been hurt, and the task of building a disciplined, internally democratic organization and ridding the UCS of careless management attitudes and practices will not be easy for the new leadership.

Haitian-American Community Help Organization (HACHO). Functioning in four isolated rural departments in northeast Haiti, HACHO is an example of paternalistic, non-participatory, aid-financed doles. Its brightest hours came when it executed a famine relief program in this drought stricken area to save people from starving; but it is far removed from building the "community help organizations" that its name alludes to. At a significant cost, it established an administrative structure in an underdeveloped region that did not have such an agency before. This bureaucracy, however, delivers its services to the LNL very inefficiently, and it does not motivate them to get involved in taking developmental processes into their own hands nor provide any organizational structure for them to do so.

In 1966 funds were given by AID to CARE to develop self-sustaining community action programs in Haiti. HACHO's mandate broadened with time to include: 1) provision of preventive and curative medicine; 2) nutritional assistance and feeding; 3) road construction; 4) agricultural development; and 5) a variety of community development activities such as potable water, schools, latrines, and formation of community action groups, instruction in arts and crafts, etc. A 1976 evaluation revealed that all HACHO's medical facilities are underused, including doctors, drugs, vehicles, and costly medical equipment, for a variety of reasons. The nutrition centers that exist feed children foreign foods that are not produced in the area. There is no preventive medical care at these centers, so healthy children may become infected by unhealthy ones while they are there. The only women who take time out from their workday to bring children to these centers are mothers who have no other access to food. HACHO has constructed some valuable physical infrastructure in the region such as roads, potable water systems, schools and public latrines. On occasion, local people have given considerable amounts of their labor to build these things. But no funds are allocated to maintain this infrastructure, nor is there any public education to encourage people to use it properly. So, for example, public latrines are abandoned after a short period of use because they are so unsanitary that no one wants to use them.

HACHO is working with 129 community councils in the region. Surveys suggest that about one-third of these are able to some extent to mobilize resources, tackle problems arising in local

HACHO projects, and do some things without HACHO assistance. In terms of initiating projects, however, the councils are passive recipients of what HACHO funds permit them to do. HACHO's central offices are in the distant capital city. This not only creates administrative delays, but keeps the people who make decisions away from the actual context where they are carried out. HACHO funds specific projects; it does not give grants to local councils to increase their implementation experience.

Techniques to Support the Development of Self-Reliant Processes Among the Rural Poor

The most successful catalyst agents in the previous cases were carrying out four types of activities. First, through some form of nonformal adult education, they were making people aware of common problems and teaching them something about tools for problem solving and group action. Second, they were changing peoples' attitudes about the way they saw themselves and their relationship to their natural and social environment. Third, they were building organizations for group action within communities, among communities, and by local people together with (or acting on) public agencies. Finally, they were setting in motion processes to create assets and skills.

Nonformal education techniques for creating a consensus about common problems and appropriate solutions. An important factor in fostering LNL group action is a close and cooperative relationship between the catalyst agent and local people which features mutual respect for the information, experience and resources which each possesses that can be brought to bear on local problems. This close working relationship was not difficult to establish initially in the case of BRAC in Bangladesh where the physical survival per se of the poorest sectors was threatened. Establishing a positive relationship can be more of a challenge, however, when people were at slightly higher levels of subsistence. Recall the case of the Social Work Research Center in India where patterns of caste and class created obstacles to cooperation among the weakest social sectors or between them and the catalyst agent.

Some policy implementers, thinking in terms of basic needs, have assumed that the lower the level of actual physical poverty, the more the LNL will be willing to join in a development effort. Our cases suggest, however, that it was not necessarily the poorest people who had the highest levels of group action, but the people that perceived some aspect of their survival as being threatened who took action to remedy it. In the MARSILA project of the Philippines, the insecure tenants perceived that outsiders

were going to try to evict them. In the Ayni Ruway project of Bolivia, local people believed that their culture was being repressed, their sons and daughters were being alienated from them. Does this observation mean that catalyst agents coming down to local levels can expect cooperation from the LNL only when they are faced with some kind of crisis that threatens their survival? Not at all; but the absence of a threat to their existing equilibrium, at whatever level, may cause the LNL to lack a perception of how group action can work in their benefit. An important function of the catalyst agent is to facilitate this perception.

Agents like BRAC used non-formal educational techniques that included convening people to identify their most important problems, and then discussing ideas to resolve them. For example, in one case (not covered here) people said their biggest problem was the lack of income earning opportunities. When questioned about what they might do to reverse this, participants identified specific activities such as pig-raising which were within their range of skills and resources. Further NFE lessons discussed the diseases of pigs and the health hazards and economic damage that unenclosed pigs cause. Once people were aware of issues involved in raising pigs, a local extension agent was made available to answer their questions. Later, ways of financing people to obtain pigs, to control diseases, etc. were discussed.

Among the cases presented here the most paternalistic example, HACHO, supplied no kind of non-formal education. This component of a project not only allows local people to recognize possibilities for group action, but it also educates the catalyst agent about local felt needs and the resources which local people could contribute to a development effort, as well as the terms on which they are willing to contribute them. By itself, non-formal education cannot create participation; but this type of information exchange is an important facilitator of it.

Motivating a commitment for change. Another important emphasis of self-reliant strategies, one which distinguishes them from programs that concentrate purely on welfare or economic growth, is a concern with the total human being--not just his material needs, but his psychological needs as well. This focus is a particularly important one for working with target groups that are heavily dominated by other racial, caste, or ethnic groups in their society.

One direct way of building self-esteem is to provide meaningful opportunities to disadvantaged people to earn an income and accumulate assets. In the case of outcast groups in Rajasthan,

India, employment was a way of raising their status, not only in their own eyes, but in the opinion of other elements of the community. At times developmental purposes are served by channeling economic opportunities directly to such select disadvantaged target groups. In other instances, however, it may be counterproductive to create or exacerbate distinctions within a community; and inputs other than economic resources are needed to build the self-esteem and social status of disadvantaged groups.

As an example of effective motivation in several respects, we may consider the Ayni Ruway program. A goal of the program was to encourage people to esteem the Quechua language and customs. Textbooks were written to give instructions in the Quechua language (the first of their kind among the people). Local folklore and music were recorded on cassettes and broadcast by radio. The catalyst agent designed a strong regional network for social communication with theater, radio programs, newspapers, murals and prints, and exchanges among different ecological zones and cultural areas of the project. It taxed one-quarter of the profits earned by the rural industries of the project to support this communications network, so the affirmation of common values could become an intense, on-going process. Radio was an inexpensive way to maintain communities in frequent contact; each community center had a radio, and people gathered at prearranged times to hear news of other member towns, information about new agricultural technologies, etc. All these activities were low cost, enjoyable ways to build social solidarity.

The factor most responsible for Ayni Ruway's success was the astonishing skill with which it adapted social technologies to local customs and tastes. Ayni Ruway accomplished this by starting with a small pilot project in two communities in order to discover appropriate ways for doing it. Once the two communities organized a cooperative based on barter to their satisfaction, then their representative started going to other communities to expand it, and the project sites multiplied. This kind of nearly self-generating replication is seldom achieved. People do not undertake sustained self-help activities, they will not accept sacrifice, unless they value the group in which they are engaged in developmental action. They will not enforce internal standards of equity and fair play without having a high degree of social cohesion and mutual respect. Cultural rather than economic activities may sometimes form the cement that gives them this cohesion.

Building organizational structures for group action. In addition to well adapted social technology, the right kind of organizational infrastructure must exist to shape and sustain group action.

Appropriate organizations might take the form of local government units; more often they are agrarian leagues, lending societies, women's clubs, occupational associations, or even structures based on quite different functions such as community health care organizations. Some successful organizations may be formally registered with public authorities or may seek that as an organizational goal, but others function without governmental standing or recognition. What matters is not whether the organization is formal or non-formal, closely geared to higher authority or not, but what happens within it.

The building of numerous local structures, physical or organizational, is no guarantee that a viable process of community decision-making is being created. That is the lesson from both BRAC's Sulla Project and HACHO. In Sulla, for example, BRAC emphasized the construction of community centers hoping that the presence of these buildings would stimulate collective organization. They did not. HACHO established local government councils; but these councils were neither able to mobilize local support, nor did they receive resources (authority, money, status) from the project management. So their real power to initiate and carry out local change was very limited.

What are some characteristics that might be used to judge the quality of the decision-making participation? One is that local units have the formal authority and the actual ability to initiate projects. A second is that they have financial resources. A third requisite is that a consultative decision-making process should go on within local units, and between local units and their parent organizational structure. The forms of this consultative process vary with cultures; they could be formalized voting, or the more informal or consensual types of decision-making; but they must provide local people with a voice that is listened to. Finally, for genuine shared decision-making, projects have to be or have the prospect of becoming relatively free of critical dependencies, whether on external funding, on one or a few dominant leaders, or on the outside organizers or catalyst agents themselves.

If we examine the most participatory of the cases presented here, Ayni Ruway, it scores well on each of the above criteria. Participating communities have the authority to initiate activities, and one-quarter of the proceeds earned by the association as a whole are dedicated to these local works. Within the project, authority is shared by the local leaders and by the catalyst agent (called PROCAM). The latter has the responsibility for transacting Ayni Ruway business in the outside economy and for re-

search and design of appropriate technologies for social communication, agriculture and artisan industries. Every six months the community leaders and PROCAM specialists joined to elect five leaders from their ranks to be the current executive committee of the project. Dependence on external funding, on a single leader, or even on the catalyst PROCAM are thus very limited.

Contrast this with HACHO. Because HACHO was the only source of aid in the area, local councils realistically never refused it; this resulted in the outside agency making all the decisions about project activities. In some instances projects were implemented that were out of touch with local people's desires or needs. The worst effect has been to create a critical dependency on the implementing agency: some councils existed only for the purpose of collecting and distributing food supplies or food for work. Sometimes this was done in a way that advanced community goals; but on other occasions it benefited mostly the individuals managing the local programs. Some of the problems stemmed from HACHO's refusal to make grants to these local bodies, but difficulties were built into the way the entire program was designed. Because there were no projects for improvement in agriculture, artisan industries or fishing, there was no productive base to create new assets that could reduce dependence on the external donor. HACHO also had no programs to foster group action.

When a catalyst agent encourages responsible, responsive membership, this can add to the vitality of local organizations. It may recommend or require that local people contribute some of their own time or resources as a condition of membership. The SWRC, for example, would not accept a community into its village program until the community itself had formed a consensus about selecting and financing a local paramedic from among its own ranks. Some catalyst agents, however, prefer to have almost no involvement at all in the formation of local leadership or in the structuring of local groups. In the case of MARSILA in the Philippines, leaders emerged naturally during the mobilization process. After three or four mobilizations for particular group actions, working relations had developed that allowed people to test one another and have confidence in their leaders and their group.

The experience of Marsala and Ayni Ruway suggest that the formation of organizations among disadvantaged social groups must be structured at the pace at which members are prepared to cooperate together, make group decisions, and have faith in their leaders. Setting up formal organizations before people are ready for it results in a hierarchically structured organization with rank and file members sitting back and letting the educated, better-off leaders take the initiative and make the decisions.

Creating employment and generating income. Developing processes which create local assets, and establishing LNL control over these assets and processes, is the most complex activity for the fostering of participation. An important factor for successes in this area has been the extent to which the actions to increase productivity are integrated with other components of a project. To illustrate, let us look at the operationalization of BRAC's agricultural program in Bangladesh.

A challenge for BRAC was to assist the development of the landless and nearly-landless who together constituted 85% of the workforce in the Sulla region. A complicating problem in assisting them were monsoon floods that permitted only a short growing season. So BRAC also had to develop a system to reliably supply inputs during the growing season. To do this, BRAC grouped local farmers into "blocks", each working approximately 20 ha. Farmers decided on a common plan for the block, and BRAC provided extension service, rice seeds, credit and instruction in making compost fertilizer. BRAC also rented and operated irrigation pumps and mechanical tillers for the blocks. Even some landless were formed into blocks: BRAC rented the land for them, and they received food for their work during the leveling and other preparatory operations. Because of the shortage of land, BRAC distributed free vegetable seeds so that sandy areas not suitable to rice could be used to produce additional food. Despite its efforts, BRAC did not achieve the economic impact it could have on the LNL in the first three years because the agricultural and horticultural programs were not integrated with other project components: people had received no instruction on the nutritional value and preparation of vegetables; no connection between latrines and compost was made; cadre were not trained to mobilize the landless on food-for-work sites to prepare land effectively. After it was discovered that most of BRAC's services were benefiting the larger landowners, however, the development of better integrative linkages among project activities became one of BRAC's primary strategies for reaching the most disadvantaged social sectors more effectively.

This same kind of integration needed in agriculture is necessary for skills training courses and other programs to promote rural or cottage industries. Phillip Coombs has noted that the major weaknesses of most skills training programs in rural areas were that project designers gave too little attention to the kinds of skills that were really needed in the specific situation, and focused too narrowly on training activities without concern for the relationships these skills must have with other factors in the local environment to be effective. He suggested that training methods must fit the vocabulary, habits, and assimilation capacities of particular rural audiences.

The skills training and rural industry programs of the Social Work and Research Center in Rajasthan, India were fairly well adapted to the local environment from the start. The SWRC understood the area's potential and designed programs that were arranged with convenience of the participants from the start. The SWRC established a pre-school nursery next door where children of participating mothers were cared for and given a nutritious meal; SWRC health authorities also provided immunization for the children, and child care education to the mothers. Because the target group was comprised of economically destitute women, the SWRC placed emphasis on producing products that had saleability and on finding markets for them. Technologies for making the products (clothing, craft items, printed block textiles) were not complex; but the SWRC hired a consultant experienced with market demands who advised on colors, designs, styles, etc., and it arranged exhibitions of products in Delhi and Bombay. A free-lance middleman was paid a commission to sell to smaller shops and buyers in urban areas; and a crafts marketing center in Delhi was given a commission to sell to larger buyers. For the more enterprising women who wanted to strike off on their own while using the SWRC's marketing services, a large loan was obtained from the Reserve Bank of India which the SWRC in turn dispersed in much smaller sums for the purchase of equipment and raw materials. This enabled women artisans to return to their villages and spread the program.

In addition, the SWRC linked its handicraft industry to the traditional occupational skills of two lower castes in the area that tanned hides and made leathercraft goods. The leather goods were colorfully embroidered, and with their attractiveness could have sold well on urban markets. But they had a major defect: because of improper tanning, they would develop mold and fungi in a few months. To remedy this, the SWRC brought a chemical engineer from the Central Leather Research Institute in the state of Gujarat to consult with and advise local tanners in low-cost, effective methods of curing hides. A way was found to improve the local process; and at that point the tanners and the SWRC contracted with a well known commercial firm to establish a tannery and footwear factory. The new leather factory will not only create employment for the tanner castes (who partially own it) but will also supply local artisans with raw materials at prices they could not have afforded if they had to purchase them from outside the region.

Evaluating LNL Projects for Their Contribution to Sustained Development

Apart from discussing operational techniques, we have to be able to assess the sum of a project's achievements in terms of whether it provides some lasting improvements in the weakest sectors of society. Projects or programs should be evaluated accordingly for the quality of developmental processes they further or create. In order to do so, however, we need to specify what these processes are that can make structural changes to favor the LNL, and identify indicators of them. Rural development should be a process which leads to a rise in the capacity of rural people to have greater control over their natural and social environment, accompanied by a wider distribution of benefits resulting from such control. We think the following processes are important for enabling the LNL to achieve self-reliant development:

1. effective improvements in resources and services available to the weakest socio-economic sectors, including greater access to and choices among resources/services and improved bargaining power;
2. effective social gains which improve the way the LNL look at themselves and their environment, and improve the way they are viewed by other groups;
3. organizations and participatory processes which allow the LNL to equitably share benefits, decision-making and project control;
4. viable economic processes that are self-explanatory, not decapitalizing; and
5. multiplier linkages and relationships that spread developmental processes beyond the confines of a narrow target group.

A brief assessment in these terms of the four more successful programs follows.

The Bangladesh Rural Advancement Committee (BRAC)

BRAC activities have contributed to giving some LNL choices they would not otherwise have, as well as promoting more creative perceptions about their environment and greater willing-

ness to work together. In its first few years of operation, BRAC initiated mostly agricultural programs that were managed from the top down with little community participation in project decision-making or control. Despite original claims that its programs were to help the poorest of the poor, BRAC did not pay much attention to socio-economic stratification. Its programs became disproportionately used by those who had assets.

Once the decision was made to remedy this weakness and to integrate BRAC programs with one another, project designs became more location-specific and more oriented toward focusing benefits on the LNL and promoting collective action among them. BRAC now has a strategy to train cadre (youth groups) that will work more intensively with assetless people and deliver better services. But land is tightly controlled by a small minority in the areas where BRAC operates; and unless it can devise a strategy to enable landless people to gain more access to land, the success of BRAC's economic programs is still in question.

The Social Work and Research Center, India (SWRC)

In contrast to BRAC, SWRC did a good job in its first few years of integrating its services and focusing them on the lowest income strata. This integration took four forms. It occurred within programs when, for example, attention was paid not just to skills training in handicraft industries, but to the procurement of raw materials, research and design technology, and to marketing outlets. Integration occurred between programs when education and health components supplemented programs in water and agricultural development. Integration occurred between levels of project activities when village health workers returned once a week to share their experiences among themselves and with the catalyst agent. Finally, integrative linkages developed between the SWRC and government agencies, international agencies and other private domestic agencies. An instrumental factor in accomplishing these forms of integration was that important decisions were made at the block level--close enough to have a clear view of local realities.

If there is one weakness in the SWRC strategy in terms of fostering structural change, it is that much of the emphasis to date has been on top-down efforts to deliver skills or services to individuals. Even with the village health workers, the terms on which this service operates have been pretty much determined by the catalyst agent; the amount of local community initiative is low. Unless this condition can be changed in favor of increased collective activities, it appears that despite SWRC successes in

carrying out its program there will still be an unhealthy dependence relationship for local LNL people on the catalyst agent.

Ayni Ruway, Bolivia

The outside organizer of Ayni Ruway began with the advantage of having experienced previous failures with LNL groups. From the start the emphasis was not on introducing extraneous programs, but on reinforcing local culture and social organization. To accomplish these goals, the catalyst agent never tried to implement the project activities itself but only to train local peasants for management responsibilities. For example, a team of campesino journalists was trained to publish the weekly newspaper and other written materials. Indigenous representatives also ran the theatre and folklore activities. The artisan workshops and industries were never managed by the catalyst agent, but by the communities themselves. Once a mechanism was established to barter among communities, the network expanded outward because the greater the ecological variety of communities, the more products there would be to exchange. Joining Ayni Ruway was not difficult for new communities because they too had economies based on exchange among household units. The barter system freed them from intermediaries; and the artisan industries earned the funds necessary to provide credit and set up further small factories.

The big test for Ayni Ruway came when the foreign assistance which had funded the catalyst agent terminated in 1977. At that time it was decided to pay all project personnel--Quechuan and non-Quechuan--the same salary. This meant pay cuts for staff members from the outside agency, and all but two of these resigned; the catalyst agent disbanded itself, and Ayni Ruway has continued under indigenous leadership ever since. This is the only case presented here that has genuinely achieved the most complete of all forms of LNL participation: 100% project control.

MARSILA, the Philippines

This is an example of particularly high social gains and participation in decision-making and project control which has clearly resulted in structural change for rural communities vis-a-vis local authorities, Church officials, and provincial and national government representatives. LNL have formed an efficient pressure group to defend their rights and obtain public goods and services, and the experience of social mobilization has changed the MARSILA members' attitudes about themselves. They now have more confidence in their

ability to solve problems and they are willing to take more risks and tackle more complex problems. The numerous linkages they made to government ministries, to international agencies like the Catholic Relief Service or UNICEF, or to domestic private agencies have not created critical dependencies because these linkages have been in many directions and were forged on the terms of the MARSILA members. At times their contentious approach has resulted in being denied requests by government officials accustomed to more deferring behavior. But that same contentious spirit has been instrumental in enabling MARSILA residents to pursue objectives doggedly over time despite temporary setbacks.

In terms of economic development, however, the achievements of the MARSILA group have been slow and not very spectacular. This is a trade-off for being self-reliant and exercising such autonomous control over their activities. If this local organization were part of some larger regional network, the larger grouping could support a resource center of appropriate technologies, improved agricultural practices, etc., so that the participants in this movement would have better processes of asset creation. But MARSILA has shared its learning and pressure tactics locally with many other insecure communities squatting on the forest reserve lands. Some of these communities have cash crops and agricultural practices much more advanced than those of the MARSILA barrios, so there is a possibility for learning by the latter. Whether these tentative links will result in a regional organizational network, however, it is still too early to predict.

In summary, private agencies have a range of philosophies and skills. Development assistance should not be channeled to those agencies that leave local people more dependent on outside resources, advice and technology as a result of their intervention. Assistance given to agents that can improve the "participation" of the poor not simply in receiving a service, but in building up their organization and problem-solving capabilities will bring about lasting development.

Catalyst agents of the private sector cannot alone promote the development of the most disadvantaged social sectors. They are better able to understand local priorities and resources, and the organizations they build can lay the basis for a more productive exchange between local people and public officials; it may be faster and more effective to try both to organize clienteles locally and extend government administration from above at the same time to overcome development problems.

[Excerpted from Reaching the Asset-less Poor: An Assessment of Projects and Strategies for Their Self-Reliant Development, The Rural Development Committee, Cornell University, Ithaca, New York, 1978.]

Note: This monograph can be ordered from the Rural Development Committee, Cornell University, Ithaca, N. Y. 14853, U. S. A., for \$4.00. The author would welcome all enquiries or correspondence.



**MARKETING
CONTRACEPTIVES**

INDIAN MEN RECEIVING
CONTRACEPTIVES THROUGH THE INDIAN
GOVERNMENT FAMILY PLANNING
PROGRAM. (PHOTO: USAID)

The Marketing of Contraceptives

The reliance on private commercial channels for distribution of contraceptives is a relatively recent development in government family planning programs, although contraceptives have, of course, been offered for sale by various kinds of merchants for some years. The sales of the latter type must yield a profit to the seller, and often they must also compensate him for dealing with problems of legal restriction and a possibility of adverse publicity. Prices of contraceptives have therefore been too high to induce acceptance by the large numbers of poor people at whom government programs are aimed. However, the conventional distribution of contraceptives through medical clinics and other government channels has its own lack of appeal to potential users, as discussed in articles below, even though the price they paid was zero or very low. But if a government-subsidized supply of contraceptives at very low cost could be moved through private channels, then it might be possible to get the best of both worlds.

The use of commercial techniques and channels to pursue an objective considered desirable to society is called "social marketing." Since such marketing would be unnecessary for products that could be sold in sufficient volume at prices profitable to sellers, the reliance on social marketing implies at least some subsidy--in the case of contraceptives a considerable one. Nevertheless, social marketing can often be both cheaper for governments as well as more effective in building a volume of acceptance by comparison with government distribution.

Specifically, social marketing of contraceptives, with the use of advertising campaigns and other devices that occur to private distributors with our economic incentive, have the following advantages:

1. They can move through existing commercial networks (retail stores, etc.), obviating the need to build new ones.
2. They can very quickly reach nation-wide coverage.
3. Proximity of outlets to customers has been significant in increasing contraceptive use.
4. Advertising and point-of-sale promotion methods have done a great deal to raise public consciousness of family planning.
5. Commercial distributors will be able to cover their cost of marketing, so that governments will be able to limit their expenditures on a family

planning program to predictable subsidies of the cost of contraceptives (plus whatever subsidized advertising, etc., they may wish to support from time to time). 6. The private profit incentive can lead distributors to think up imaginative methods of appealing to consumers not possible with government distribution, or to quickly halt and revise methods that are producing indifferent or hostile reactions from the public.

The predominant methods of distributing contraceptives, from the beginning of the big push on this in the mid-1960s into the early 1970s, was through Health Ministry channels, and on the local level through clinics. In 1968 India began the first major effort to develop commercial distribution (see article by Gupta below). The Indian effort, which is the only developing country program to include a local manufacture of condoms, remains the world's largest -- by now the sale of condoms has exceeded 500,000,000. It is, of course, related to a country's population size: local manufacture of condoms requires a market of perhaps 30 million, and of pills perhaps 50 million. Indonesia is currently planning local manufacture; the Philippines are considering it.

The use of commercial distributors for government-subsidized contraceptives has been growing rapidly since the mid-1970s. Programs in India, Sri Lanka and Colombia are described in articles that follow; in all three countries, these programs have continued to grow significantly since the articles were first written. In addition, there are important new programs in Bangladesh and Jamaica, and in Nepal, Ghana, El Salvador and in Mexico. That in Bangladesh is especially significant, given the large population, economic problems and initial poverty of the country. Already total sales have exceeded 32 million condoms and 1.8 million pill cycles; and the continuing sales are 2 million condoms and 100,000 pill cycles per month. And the potential for social marketing in other areas such as health or nutrition, has yet to be fully explored.

Gordon Donald
Editor

Acceptors and Acceptability

Henry P. David

[Family planning literature abounds with examples of misguided attempts to change people's customs and traditions. It is easier, cheaper and more effective to supply what people will accept, and more is being learned about this subject by a WHO Task Force and other research.]

Although the concept of the family is universal and has been studied in all cultures, little is known about how humans decide to regulate their fertility or determine what methods are acceptable to them. Abortion continues to be the single most widely practiced method of birth control, regardless of legal limitations and moral exhortations. Few visitors can forget the sight of women emerging from Sunday mass in Manila Cathedral to browse among the forty or so stalls in the Cathedral Square. Among the many religious artifacts for sale are rows of San Miguel bottles, containing not beer but an ill-tasting brown liquid which, according to Philippine folklore, will bring on a late period. Sunday sales are brisk and have been for generations. In far too many lands, especially in the rural areas of developing countries where most of the world's population lives, abortion is illegal, unsafe, and undignified. Nevertheless, it will continue as long as there are no culturally acceptable, reversible, and effective life-long contraception methods.

Apart from bio-medical research, two recent developments are of particular interest. The first

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is the cooperative cross-cultural research program on acceptability of fertility-regulating methods coordinated by the World Health Organization, and the second is commercial channels and community-based contraceptive distribution.

Concept of Acceptability

Fertility-regulating methods have traditionally been devised and offered in terms of the convenience of the providers of the service. Only recently has there been concern about how methods would be received or perceived by the user. Early Indian experience with the first generation of intrauterine devices offers an instructive example. While the increase in the amount of menstrual bleeding associated with the plastic IUD was tolerable to biomedical scientists, it was apparently not acceptable to Indian women. Difficulties were compounded by the frequent failure of service providers to warn women what to expect. Similar blunders were made in Tunisia in the mid 1960s. A promising new method thus failed to win acceptance largely through insensitivity to the impact of side effects on the user.

The literature on innovation and directed culture change abounds with examples of misguided attempts to change people's customs and traditions in ways thought beneficial by the innovator and disastrous by those "benefitted." Polgar and Hatcher (1970) suggest that failure can frequently be attributed to shortcomings in provision of services rather than to "cultural barriers." Scrimshaw's discussion (1973) of the need for understanding local standards of pudor (modesty or shame associated with the female role) is an important example of insensitivity from Ecuador. Indeed, as of mid-1976, there is only one country, the People's Republic of China (PRC) where all methods of contraception, post-conception control, and fertility termination are readily available, cheap, easily accessible at hours convenient to the user, and with sensitive "services to the people" provided by highly skilled and culturally attuned paramedical personnel. The PRC program of birth planning is unique in organization, intensity, and scope, with an emphasis on self-reliance and acceptance of social self-discipline. There is however one cultural consideration; unmarried women must pay a fee for abortions that are free for their married sisters.

Acceptability is affected by, among other things, gender, route of administration, frequency of use, circumstances of use, and side effects. In Iran, for example, Siassi found that continuation of oral contraceptives was far more effective when the husbands agreed to see that their wives took the pill. In parts of rural Indonesia village chiefs beat gongs at night to remind women to take their pills before going to sleep. A Visiting Husband Pill was developed in the People's

Republic of China for spouses who work apart and see each other only infrequently. In Thailand injectable contraceptives likely to delay menstruation for three to six months fit particularly well into cultural patterns.

There is some evidence that family planning programs tend to increase acceptance rates in developing countries independent of levels of socioeconomic development. There is on the other hand growing recognition that to be effective in reducing population growth, family planning programs should be conducted within a context of socioeconomic planning and better career opportunities for women. Although 91 percent of the inhabitants of the developing world live in nations having official policies to reduce population growth rates and/or providing official support for family planning, acceptance rates by married women at risk of conception range from two percent to 25 percent per year. As Berelson (1976) observed, "neither demand nor delivery exists sufficiently in many developing countries at need."

Experiences from developed countries are also relevant. In Sweden, for example, condoms are available from self-service display cases strategically placed near the checkout counters of supermarkets. During the pill scare, the Minister of Health appeared on TV with the recommendation that women carry condoms in their purses. In Japan, attractively packaged colored condoms accompanied by detailed illustrated instructions are sold by women to women in their homes. Luminous black condoms are the current best sellers. Erotic fantasy has more appeal than "medicalization" of normal fertility-regulating behavior.

In sum, the concept of cultural acceptability has gradually shifted. From concern with how many couples could be persuaded to practice contraception, the emphasis is now on learning how people perceive reproduction and fertility regulation, the context within which communication occurs, the cultural relevance of available fertility regulating methods. Pills are no longer offered to women who are fearful that objects will stick in their throats, or IUDs to women who have difficulty tolerating bleeding between periods.

Task Force on Acceptability

In 1973 the WHO (World Health Organization) set up a Task Force on the Acceptability of Fertility Regulating Methods whose findings are expected to yield a profile of the "cultural specifications" of acceptability for the guidance of biomedical research. As defined in a Task Force statement, "Acceptability refers to the degree to which a method or any of its attributes is perceived by potential users to be consonant with their well-being." It is understood that

acceptability will vary among individuals according to age, gender, stage in life cycle or parity, for example, as well as among cultural groups and countries.

The scope of the WHO Task Force has been broadening. Initially, research focussed on perceptions of intrinsic attributes of specific fertility-regulating methods. It became evident that the findings were of importance not only in providing suggestions for bio-medical research, but also for the improvement of existing family planning services and planned future delivery systems. By 1977 wider terms of reference included research on psycho-social issues regarding family planning programs as well as on specific methods. In addition, the Task Force endeavors to strengthen social science research capabilities in developing countries, and to increase communication and understanding between bio-medical and social scientists.

The 1977 Task Force Report and personal discussion in Geneva indicate that as of October 1977 there were 67 projects in 25 countries, 18 of which are classified as "developing". Multiple projects are conducted in 15 countries, with seven each in India, Korea and Mexico. Presentations at international seminars demonstrate that considerable progress has been achieved by projects in which several nations have cooperated in design, methodology and operation. For example, acceptability of new male antifertility methods has been studied in Fiji, India, Iran, Korea, Mexico, and the USA. Results show that new male methods, e. g. a daily pill or monthly injection, were more attractive than condoms or vasectomy in rural India, Iran, Korea and Mexico. For Fiji and urban India, however, condoms rated highest. Vasectomy was least acceptable in all countries. More than half of those men using no contraceptive were willing to try new methods.

Building in part on growing awareness of the importance of psychosocial aspects of menstruation, another multinational project is seeking to obtain data on "normal" menstrual bleeding patterns and use it as a reference to assess perception of and attitudes toward variations. The findings are expected to help define acceptable limits of changes in menstruation caused by contraceptives. The study has been designed by collaborating scientists in India, Egypt, Indonesia, Jamaica, Korea, Mexico, Nigeria, Pakistan, Philippines, United Kingdom, and Yugoslavia. Initial observations from all nations confirm that the unexpected presence or absence of vaginal bleeding, or variation in its characteristics, is alarming to women and usually perceived as a symptom of abnormality. Sexual, social, and/or religious proscriptions during bleeding are present in all countries but tend to be more strictly observed in developing countries. Uneducated women tend to be misinformed about the relationship between menses and ovulation, often practicing the rhythm method with inappropriate timing.

It has long been recognized by anthropologists that users' perceptions and attitudes to indigenous and non-prescription methods of contraception and abortion may provide useful pointers to the acceptability of new methods. Several acceptability projects have been integrated with clinical trials of injectable contraceptives, medicated vaginal rings, and prostaglandin vaginal suppositories. Acceptability research is accompanying trials of the Chinese "paper pill" and of male anti-fertility methods. Among completed projects are a study of women's beliefs about reproductive physiology and health in Mexico; an anthropological study of the acceptability of selected attributes of methods in Brazil; and a study in Thailand of traditional beliefs about anatomy.

Task Force research is also exploring preferences among oral, vaginal, and injectable procedures. Decisions to choose among available contraceptives, to switch between methods, or to discontinue contraception are being examined. Most Task Force research employs precoded or open-ended survey questionnaires while exploring other approaches, including for example more sophisticated scaling and rating techniques. In addition, the Task Force, in cooperation with the Department of Sociology at the University of Exeter (UK), sponsored for several years a manpower development program providing nine months of specialist training for behavioral scientists from developing countries. In-country training will continue to accompany major field studies.

The WHO Task Force is a pioneer in carrying this type of social science research throughout the world. A predominantly medical establishment is putting cultural acceptability nearly on a par with safety and effectiveness. The studies investigating not only whether methods and services are acceptable but why they are not should provide valuable feedback to family planning administrators and policy-makers. The eventual reports of worldwide Task Force experience will be awaited with much interest.

Commercial Channels and Community Based Distribution

Commercial and semi-commercial channels for distribution of contraceptives necessarily rely on their appeal to consumers. The establishment of local community channels can be of great value in stimulating consumer acceptance. Contraceptives may be distributed through commercial channels (as in Sri Lanka), or may be supplied to distributors who sell them at subsidized prices keeping part of the proceeds as an incentive payment (as in Indonesia and Thailand). Reports from over 33 countries in the developing world were prepared by Fullam and by Huber et al in 1975. The common denominator of all these schemes is that contraceptives are distributed to men and women without attendance at a clinic or

medical prescriptions. When management is in the hands of commercial entrepreneurs, this can reduce the dependence on government subsidy or on support from nonprofit international organizations.

Mechai Viravaidya, the imaginative founder-director of the Community Based Family Planning Services in Thailand, astonished participants in the 1974 World Population Conference in Bucharest with his vivid descriptions and pictures. He has taken contraceptives out of the medical setting and made them household objects, especially in the rural villages. For example, condom distributors are trained to demonstrate how the ring at the top can be torn off and used as a rubber band or to hold a child's hair. Other uses are as a tourniquet for snake bites or as a container for clean water. Colorful condoms are given to children to blow up as balloons, conveying a message to parents. Oral pill packages will soon be printed with markings along the edge so that children can use the empty packets as school rulers. Children sing the family planning song; T-shirts with the slogan of "too many children make you poor" are sold to adolescents; and rural teachers are trained to become village distributors of contraceptives. The work is blessed by a monk from the local temple who assures the distributors that they are serving their country. On Chinese New Year's Day, Family Planning Promotion Girls from the Community Based Family Planning Services in Bangkok presented traffic policement and district police stations with brightly colored boxes of condoms accompanied by the message "We wish you and your friends happiness and subdued fertility for the Year of the Dragon."

Condoms have become known in Thailand as "Mechais", and are accepted in payment of fares on rural buses, I am told. Oral contraceptives are now available without prescription, and medically safe abortions can be arranged. Further progress is being made through a Japanese supported project integrating rural family planning with nutrition and parasite control.

In Indonesia, thousands of local jamu (herbal medicine) retailers sell Karet KB condoms (Rubber for Family Planning) while a national distributor reaches remote villages with sound vans. In Sri Lanka, distribution of condoms by mail order under the brand name of Preethi, meaning "joy," has been successfully launched together with booklets with such titles as "Women's Friend." The oldest and largest system of community based distribution of oral contraceptives was inaugurated in 1968 by the Mothers' Clubs of South Korea. These clubs have become a way of life in rural Korea, a grass-roots movement whose activities long ago expanded to other areas. In rural Kenya,

Population Services International developed condom marketing around the brand name Kinga, which means "protection" in Swahili. Sold in local shops with advertising focused on better-off males aged 18 to 30 years, the Kinga program provided evidence that rural African men will use condoms.

Experience demonstrates the potential of contraceptive marketing, and the application of commercial marketing concepts to social aims. This concept is a dramatic departure from the traditional service providers' view that contraceptive users are "patients" in need of medical services. The message conveyed by Mechai and others is that sex is not the exclusive province of the medical establishment but a normal human experience, not necessarily associated with pregnancy. The evidence is persuasive that this kind of marketing strengthens local involvement with the distribution of contraceptives in the rural areas of developing countries. By offering contraceptives through local teachers, village shops or organizations, a community based program makes contraceptive delivery an everyday business. The contraceptive becomes commonplace, easily obtainable through a familiar distributor who shares customers' beliefs, joys, and hardships. Family planning becomes part of local life, rather than something coming from outside.

[Extracted from Populi, Vol. 4, No. 4, 1977, pp. 18-24. Published by the United Nations Fund for Population Activities, New York.]

Three Essential Ingredients

Dharam Gupta

[Dharam Gupta is interviewed by a reporter from People magazine concerning conclusions from his successful experience in marketing Nirodh condoms in India. He finds three necessary elements: demand creation, a convenient delivery system, and efficient management,]

Question: Could you summarize the results of the Nirodh program and outline the lessons to be learned from this longest-running commercial distribution project?

Gupta: The sale of condoms increased nearly 16-fold during the first five years of the Nirodh marketing program. An estimated 5-7 million condoms a year were sold in the commercial market before the program started in 1968 compared with 116 million Nirodh condoms in the year 1973/74. There was also a substantial increase in free distribution. I think it is obvious that wide and efficient distribution and effective demand-creating publicity were both essential. Another lesson is that the product must be sold at a reasonable price which most people can afford. This conclusion came through dramatically when, as a result of a 67% increase in the price of the product from 15 to 25 paise (U. S. 3.5¢) and a drastic reduction in publicity, sales of Nirodh dropped substantially. The program is only now beginning to recover from that.

Mr. Gupta is an Executive Director, Community-Based Distribution Dep't., Planned Parenthood Federation, London, England, and headed the Nirodh marketing program in India from 1968 to 1975.

Question: Nirodh has been followed by a number of other projects based on the same social marketing approach but the total numbers involved worldwide are still small. How do you explain the slowness in exploiting this form of contraceptive delivery?

Gupta: This is primarily due to the prejudice people in most countries have against publicity and the open sale of contraceptives, in the mistaken belief that they lead to promiscuity. Even in India, when the program first started, there was apprehension that people would react strongly to Nirodh publicity. These fears proved to be groundless, but whenever we discuss similar types of projects with interested countries the same arguments are repeated. In spite of the available evidence there is considerable hesitation or reluctance to start such programs. Moreover, in many countries there are laws restricting advertising of contraceptives, without which a marketing program can hardly be mounted.

Question: Do you anticipate that the commercial marketing of pills will be more successful than that of condoms?

Gupta: Commercial marketing of pills on these lines is possible only in those countries which permit the sale of pills without prescription. This rules out most countries. Another problem is the initial side effects which many women suffer during the first three months. Although they are mostly minor and temporary, they do lead to a significant dropout rate and from a marketing point of view constitute an obstacle. Consequently I feel that the dramatic success of a non-medical contraceptive like condoms may not be possible with pills.

Question: Programs which have adopted the saturation or inundation approach, distributing contraceptives to every household in a target area, appear to assume that there is a strong latent demand and that availability is the key to increasing contraceptive use. How far do you go along with this?

Gupta: I find this view difficult to accept and I can give reasons. Obviously some latent demand for contraceptives does exist in every community and country; but if this demand were really strong, discontinuation rates would not be as high as we find in practically every program. Moreover, there are programs which started with huge quantities of contraceptives in anticipation of high levels of use which failed to materialize. An example of this is our CBD program in Thailand, which is under dynamic leadership fully capable of exploiting latent demand for contraceptives. Substantial quantities of pills and condoms were supplied to this program in anticipation of high demand, but initial sales were significantly below expectations. Obviously this was not because of non-availability of contraceptives, but demand had first to be created and this took time. In fact, sales of contraceptives under

this CBD program are picking up very well as demand gets built up, which further proves my point. (CBD - Community Based Distribution.)

Question: The proponents of "inundation" would say that in that case the shortcoming in the Thai program has been the insistence on charging for contraceptives and that if they had been delivered free to households this would have been the first step in gaining wide acceptance.

Gupta: I believe that for sustained expansion of family planning a small price should be charged for contraceptives. Products given free, except as samples, are looked down upon, even by the poor who have learned by bitter experience that they never receive something for nothing. They become suspicious if someone forces something free upon them--whether it is a contraceptive or anything else--and the whole exercise becomes counter-productive. I believe that this psychological reaction, which is universal, is particularly true for developing countries.

Question: The people who take the opposite view argue that one of the barriers to success has been a mentality of scarcity in the developing world--the inability to think and plan in terms of contraceptive abundance, leading to contraceptives being hoarded and no real effort made to promote them. Does this hold true in your experience?

Gupta: Possibly that was so in the initial stages of family planning programs. But that situation does not hold true any more. All around the world program managers know that contraceptives can be obtained without any problem if the demand can be demonstrated.

Question: According to Population Council figures, a family planning program needs to recruit 30 percent of all potential acceptors to reduce the birth rate to 30 per thousand. This has been achieved with considerable effort only by the best programs in the most advantaged settings. Will simple availability have any effect on fertility rates in countries like Pakistan and Bangladesh, with birth rates well above 40 and a low level of development?

Gupta: I don't think so. I believe the biggest problem we are facing today is to create demand for contraceptives, and to make an average couple understand that large families lead to economic hardship for the country as a whole, which ultimately flows back to their own family. In practice a poor man in a village sees his experience in a different light: he is miserable not because of the size of his family but because he is poor. In the same village he sees all too often that those who are rich live well even when they have large families. The usual exhortation that a small family is a happy family does not, therefore, ring true to him and fails to motivate him to practice family planning. Mere availability of

contraceptives can hardly be expected to reduce fertility under these conditions.

Question: Presumably one of the most important messages is that his children will be healthier if they are spaced. That is one message people can understand.

Gupta: Even this may not ring true to him. He sees the problem mainly in monetary terms: he cannot provide food because he does not have enough money, and if his children are ill he cannot provide them with medicine or medical treatment. Usually he relates this not to the size of his family but to his economic condition. And the correlation between his poverty and his large family just does not come through to him.

Question: One factor which makes or breaks a program is whether people who accept contraceptives continue to use them. What do you think is the key to high continuation rates?

Gupta: I am convinced that the key is a high degree of motivation, and that is the reason why I stated earlier that the saturation or inundation approach is unlikely to bring long-term results. What we need is long-term practice of family planning rather than temporary acceptance. For this reason, while we must make contraceptives easily available, we must also inculcate a high degree of motivation through appropriate communication and education.

Question: Surprisingly you have not referred to community involvement. The most effective motivation surely comes from within the community--as in China. Do you regard such involvement as an essential element in a successful CBD program?

Gupta: Yes of course, that goes without saying. But to be able to involve the community we will have to motivate it and give reasons why its involvement is desirable, for the sake of the individual, the community and the country. China demonstrates this, but I do not believe that their type of community involvement can be obtained everywhere. The strictly regimented Chinese society, by its very nature, can obtain involvement of individuals and communities in programs which have government approval without having to motivate them. I cannot imagine that such automatic community involvement is possible in the free societies in which our programs operate. But certainly community involvement brings quicker acceptance of new ideas. Without it an individual may be reluctant, even afraid, to accept a new idea for fear of possible ridicule by his neighbors.

Question: It has been suggested that although family planning programs advocate a small family norm, they more or less accept existing levels of motivation, and do not try very hard to change them, with the result that most acceptors have an average of three

and usually four children. Are the stringent sanctions on large families imposed in Singapore and elsewhere an indication that more effort should be put into persuasion?

Gupta: Yes of course. Persuasion--or demand creation, as I would like to call it--is essential, not only to achieve high continuation rates but also to involve younger couples and those with small families in the practice of family planning. In most countries, however, stringent sanctions of the Singapore type would be very difficult if not impossible to administer--and could well prove counter-productive. [See Development Digest, Jan. 1974, p. 8 on Singapore.]

Question: A variety of approaches to contraceptive delivery is now being attempted all over the world. Do you think this variety is essential, or are there certain common factors necessary to success?

Gupta: A certain degree of variety is inevitable because the requirements of each country depend on the general social and economic order prevailing, as well as on the administrative and health infrastructure. Religious and other beliefs also play an important role. There are, however, three essential common factors: effective demand creation; a good, convenient distribution or delivery system; and efficient management. It's very much like a stool which needs all three legs to stand.

Question: Do you see any special advantages in integrating CBD approaches with other programs; such as cholera research or midwifery or teaching programs?

Gupta: My personal view--and here I must emphasize this is a strictly personal view--is that such integrated approaches are of limited value. I believe that any person who is asked to do something must be very clear about his objectives and what he is required to achieve. If people know that their job is to promote family planning and distribute contraceptives and that their performance will be measured by their achievement in this field, they will use their efforts and ingenuity to improve that program. But if they are made responsible for a host of other things, we may unwittingly be giving them an opportunity for not putting sufficient efforts into a program which does not interest them.

Moreover, all the programs may suffer because our efforts will be dissipated. The advantage claimed for such an integrated approach is that a person will accept family planning more readily if he also receives some sort of visible benefit--for example treatment of an illness. This means we are piggy-backing on another infrastructure or motivating factor. But this type of motivation will not be strong enough to ensure high continuation rates and, therefore, cannot yield good results in the long run.

Question: Finally, how far is the success of family planning programs a matter of political will and how far is it due to other factors?

Gupta: Political backing for a program will accelerate its pace and contribute to its success. But political will alone is not enough: it cannot replace the three basic requirements to which I referred earlier. This can be seen, for example, in Pakistan, Nepal and Bangladesh, which have shown the political will but need to strengthen the three basic components of their programs.

[Extracted from People, Vol. 4
No. 1, 1977, pp. 6-8. Pub-
lished by the International
Planned Parenthood Federation,
London, England.]

Contraceptives, Marketing and Machismo

Staff of People Magazine

[This article presents a succinct account of various kinds of attitudes and problems encountered when a contraceptive marketing program is started in a Latin American country.]

A new program has been launched in Colombia for the social marketing of condoms and other contraceptives. The agency involved, Corporación para Planificación Familiar (CPF), was set up in 1975 with the aid of Population Services International (PSI), the New York- and London-based agency that started the Preethi campaign in Sri Lanka and Kinga in Kenya. PSI has pioneered the use of commercial marketing techniques--research, advertising, promotion--to "sell" contraceptives through commercial channels but without profit. PSI gave CPF a \$25,000 grant and a \$15,000 loan and provided an assessor for the first year. CPF is run by a young marketing group, Audiomóvil, and it was their task to apply the social marketing concept to the tricky problem of selling condoms to Colombia's male population.

Repacking imported condoms under the local brand name PAKs, CPF distributed them through wholesalers of cosmetics and toiletries to a network of 2,000 shops covering 80 percent of the inhabited areas of Colombia. Simultaneously an advertising campaign was launched in magazines and news-

People magazine is published in English, French and Spanish by the International Planned Parenthood Federation.

papers on the theme "Your child should not be an accident," and retailers got point-of-sale promotional material. In the first year CPF handled some 20,000 gross of condoms.

In addition, they started an experimental program of condom vending machines in bars and bus stations in Bogota. Each machine sold an average of 3.3 gross per month. But problems arose as Bogota's assiduous thieves and mafiosi (gangsters) soon woke up to the opportunity of robbing the machines. And perceptive street vendors exploited the cheapness of PAKs by buying the contents of the machines at their subsidized price and re-selling for a higher one.

The program encountered more prudishness than the Kinga or Preethi programs. TV stations turned down PAKs advertising, cinemas refused to play host to vending machines, and many chemists were reluctant to display point-of-sale material. CPF had been weathering a period of financial problems. While advertisements and supplies have had to be paid for immediately or in advance, returns from distributors filtered back more slowly, producing cash flow problems. As a result advertising had to be suspended, sales fell off, and many retailers stopped displaying promotional leaflets and posters. The problems illustrate the importance of financial planning and of a sustained campaign in social marketing projects.

CPF is now planning a fresh advertising campaign and simultaneous expansion of the distributor network to 25 wholesalers with 17,000 outlets, which should push shop sales up from the current level of 2,700 to 4,500 gross per month. In addition, 500 vending machines will be installed at key locations in rural areas--bus stations and bars in market towns--with a potential extra sale of 1,700 gross per month.

Male attitudes in Colombia have not, however, been an easy nut to crack. There are still far too many men--particularly in the poorest and most fertile groups--who regard the indiscriminate spawning of children on helpless females as an essential part of demonstrating their virility. They see the condom as an affront to their masculinity. Nevertheless the PAKs program has tested the ice and proved that it is thick enough to walk on.

[Extracted from People, Vol. 4, No. 2, 1977, p. 32. Published by the International Planned Parenthood Federation, London, England.]

The Preethi Marketing Program in Sri Lanka

John Davies and
Terrence D. J. Louis

[This article describes a fast growing marketing program for the condom named Preethi, and some of the advantages of the methods used. Methodologies for evaluating program results are discussed.]

Population Services International (PSI) was commissioned in 1973 by International Planned Parenthood Federation (IPPF) to initiate a contraceptive marketing program in Sri Lanka with the cooperation of the Family Planning Association of Sri Lanka (FPASL). Two contraceptives were marketed, condoms and oral contraceptives; this report evaluates the results of the condom program. The goal of this program was to demonstrate (1) that commercial marketing techniques could significantly increase the number of couples using reliable, modern contraceptives, and (2) that unit costs would be as low as or lower than those of clinic-based programs.

The pragmatic relationship between a product's attributes and the consumer's needs is the backbone of all commercial marketing. In the context of family planning, "the marketing task is to influence the choice process through actions that seek to increase the attractiveness and accessibility of the fertility control product". Family planning program developers have experimented with non-profit versions

Mr. Davies was the PSI Preethi project director until May 1975; and Mr. Louis was its marketing director until 1975 and is now a Sri Lanka PSI country representative.

of commercial models as alternatives to the more common clinic models. The use of commercial marketing techniques for the advancement of family planning and other social programs has been called "social marketing."

A review of the literature on social marketing programs for contraceptives in India, Indonesia and Kenya suggests that although its impact on fertility may be difficult to assess, the commercial orientation offers several advantages. It appears that such programs can be mounted quickly, with very little capital expenditures, by harnessing established channels; that monetary incentives built into the distribution chain can provide rapid program growth while reducing service costs; and that small professional marketing management teams can give the necessary expertise and flexibility to the decision-making process. Orientation of a contraceptive program toward "consumers" usually results in a large increase in awareness of the product among potential "acceptors." (Acceptors is the term used in non-marketing programs.)

Because social marketing programs are oriented toward serving the consumer's needs by supplying a product in a commercial establishment, the collection of information on the individual acceptor at the time of first acceptance, which is intrinsic to clinic procedures, is omitted. Therefore, contraceptive social marketing programs may be more difficult to evaluate than clinic programs. To a significant degree, however, sample survey data can be used to interpret marketing results and to produce measures of impact comparable in utility to those usually generated by clinic programs. Level of impact can then be compared to input costs to provide indicators of efficiency.

Generally speaking, social marketing programs produce good input and output data for judging effectiveness. Costs are readily ascertainable for clearly defined activities, and most of the costs are wholly applied to producing tangible results. Outputs (sales of contraceptives) are measured routinely each month in sales to retailers, adjusted by changes in retailer inventories to reflect actual customer purchases. This is a simple process compared with the task of assessing the efficiency of clinic-based programs -- particularly those that share facilities and personnel with activities other than family planning or those that offer various family planning services in addition to contraceptives. Furthermore, one of the difficulties of measuring real use in clinic-based programs is the necessity of assuming that supplies distributed free of charge are actually used.

Social Marketing of Condoms in Sri Lanka

The Preethi marketing program began in May 1973. During the first six months, a two-person PSI management team, assisted by a part-time Sri Lankan marketing consultant, designed the operational plan and commissioned market studies, distribution, advertising, and printing by local social agencies and private companies. On 1 October 1973 the program was launched; during the following 18 months it was monitored, modified, and evaluated under PSI management. In May 1975 PSI handed over management to the Sri Lankans.

An essential aspect of the program was the harnessing of an existing nationwide network of retailers to make Preethi available to the greatest number of fertile couples in the shortest possible time. Reckitt and Colman (Ceylon) Ltd., an established and successful marketer of various household products, was commissioned to package and distribute the imported product to its 4,000 prime retailers.

In keeping with the marketing model, targets were formulated in marketing terms, then transformed into demographic terms. The first-year target was set at 1 percent of the estimated number of adult males with discretionary cash. This came to 28,000; their requirement would be about 2 million condoms per year.

In order to evaluate the impact of the program, it was necessary to measure net increases in nationwide condom consumption as well as numbers of Preethi acceptors. Program estimates indicated that Sri Lanka's annual consumption was 1.2 million, or 0.09 per capita. Condoms were distributed through government health clinics, FPASL clinics, and approximately 300 pharmacies in cities and large towns. To obtain acceptor practice data, from which estimates of program impact could be calculated, baseline KAP (Knowledge, Attitude, Practice) surveys of men and women were conducted in both the "wet" and the "dry" zones of Sri Lanka which are representative of the nation's cultural make-up.

The data used for pre- and post-program comparisons included the following: PSI recorded sales to dealers by month and sales district, plus mail-order sales and free samples distributed directly to consumers. FPASL also provided monthly distribution records, to which were added quarterly estimates from the Health Ministry. These three systems represented all significant sources of supply for the nation. One year after Preethi was launched, the stock-on-hand of a 10 percent probability sample of Preethi shops was counted to estimate unsold stocks nationwide. Sixteen months after the launch, a profile of Preethi purchasers was made up from

interviews of customers in randomly chosen chemist shops in wet-zone towns during one business day. This single-stratum survey was the first of a series planned to generate contraceptive practice data, shopping preferences, and demographic and socioeconomic information for purposes of evaluation as well as market segmentation.

The following product-oriented prelaunch activities were also undertaken:

1. Survey of retailers' attitudes. A survey of 239 general and chemist retailers in a rural wet-zone area (Table 1) indicated almost universal awareness and approval of family planning. About three-fourths of the shop owners approved of stocking and about three-fifths were willing to display condoms. However, survey results also indicated diffidence and a lack of factual knowledge about contraceptives.

TABLE 1 Prelaunch attitudes of chemists and general retailers toward family planning and contraceptive retailing: Sri Lanka, 1973

| <i>Item</i> | <i>Percent giving positive reply</i> | |
|---|--------------------------------------|--------------------------------|
| | <i>Chemists (N = 39)</i> | <i>Retailers (N = 200)</i> |
| Aware of the family planning concept | 100 | 99 |
| Thought family planning meant to limit family size | 40 | 37 |
| Thought contraception meant to prevent births | 57 | 50 |
| Approved of family planning | 90 | 95 |
| Aware of contraceptive pills | 97 | 69 |
| Aware of condoms | 93 | 61 |
| Thought the condom works by preventing sperm from entering the vagina | 91 | 40 |
| Stocked condoms | 93 | 3 |
| Approved of stocking condoms | 93 | 75 |
| Willing to display condoms | 77 | 57 |
| Said there is a demand for condoms | 93 | 10 |
| Wanted a profit margin of 25 percent | 77 | 50 |
| Thought condoms should be advertised | 93 | 75 |

2. Naming and pricing of product. A series of consumer preference tests established the various product attributes that would be emphasized in the advertising and education campaigns, including the brand name, "Preethi", the package design and symbol, the launch-period advertising theme, and the price of 40 Sri Lankan cents (US\$0.04) for a package of condoms. (Each package contained three foil-wrapped, nipple-ended, lubricated Durex Gossamer condoms, manufactured in England.)

Preethi means happiness in both Sinhala and Tamil, the two predominant languages of Sri Lanka. It connotes joy rather than sensual pleasure, e. g., Preethi pura means happy home. In rare cases it is

even used as a person's name, either male or female. All Preethi communications reflected the joy and desirability of happy, healthy children in the home, along with a satisfying family life through adequate spacing of births. The theme throughout the two-year launch period was, "Until you want another child, rely on Preethi."

3. Retailer acceptance and orientation. For one month prior to the nationwide launch, Preethi's acceptability to retailers was tested empirically by offering the product and advertising to 200 prime retailers in a rural area. Seventy-five percent of the retailers readily purchased and displayed a full dispenser of Preethi (40 packs of 3 condoms each). A metal sign was fastened outside each shop, identifying it as a supplier of Preethi. Meanwhile, each of the 4,000 prime retailers throughout the nation was given an orientation folder and a sample of Preethi, informing him of the product, its function and benefits. He was told that he could purchase stocks the following month, when nationwide advertising was beginning.

Nationwide Launch. On 1 October 1973, nationwide distribution and mass-media advertising were initiated for two years--the time required for a new product in Sri Lanka to settle into the distribution pipeline, be accepted by target retailers, receive any marketing modifications, and find its prime market segment. It was anticipated that the postlaunch period would bring acceptance by additional segments of the fertile population. During the first launch month, 3,177 retailers purchased more than half a million condoms from traveling representatives of the distribution firm.

Communication Strategy. Three levels of education and advertising were used during the launch period:

- (1) Mass-media advertising of Preethi's benefits, mainly through newspapers, radio, cinema slides, and retailers' displays.
- (2) All Preethi retailers were educated and motivated using personal visits, samples, and booklets.
- (3) By means of a direct mail campaign, 4,500 elite opinion leaders were informed of the program. This was done in order to secure their approval of the program, the method, and the brand name as appropriate for family planning in Sri Lanka.

Results of the Social Marketing Program

By 31 March 1975, 18 months after the launch period began, nearly 5.9 million condoms had been distributed, of which 5.6 million (95%) were sold to more than 4,000 retailers, 114,000 sold by mail order, and 124,000 given away as free samples. The

higher than average volume of sales in the first month is typical of all new products; data for following months indicated actual replenishment of stocks sold to consumers, plus a slow and steady increase in the number of Preethi shops. The average monthly distribution through other sources (mostly government clinics) remained essentially the same throughout the 18-month period as it had been prior to the Preethi program--with figures dropping in early 1974, but rebounding later to higher levels.

Condom Distribution and Prevalence of Use. The number of Preethis actually used in the 18-month period was estimated to be about 4.9 million. The KAP surveys indicated that 13 percent of urban couples and 12 percent of rural couples were currently using condoms, and that two-thirds of them were using Preethi. Thus, an estimated 144,000 couples (8 percent of 1.8 million married women of reproductive age) were using Preethi, with a reported use ranging from 1 to 12 condoms per month, and a computed mean and median use of 62 per year. Acceptors who "could not say how many" they used were excluded from this calculation.

Results from this survey can be compared to those from a pilot survey of 72 Preethi purchasers in 29 randomly chosen urban chemist shops. Of the respondents completing interviews, 70 percent were men aged 25-39; 4 percent were women; 50 percent had been married for two to ten years, and 64 percent had three or fewer children. Seventy-four percent had some secondary education, and 46 percent reported spouses with a similar level of education. Seventy-nine percent lived in the urban area close to the sampled shops. Ten percent were making a first purchase. The mean reported coital rate was 10.5 per month, and the mean use rate was 8.4 condoms per month. Fifty percent reported using Preethi with every coitus, while another 26 percent said they alternated it with the rhythm method--using Preethi during the unsafe part of the cycle. Nineteen percent of the couples had tried oral contraceptives but had discontinued use. Among the 83 percent who said they would continue with Preethi, the three reasons most often given were convenience, dependability, and absence of side effects.

Increased Knowledge about the Condom. Surveys showed generally increased awareness of the condom as a family planning method, and a very high level of knowledge about Preethi. All those interviewed indicated a greater awareness of Preethi than of condoms per se. Furthermore, most of those who were aware of Preethi could describe it correctly. Women in both of the dry-zone samples registered greater knowledge of Preethi itself than of advertising about it, indicating noteworthy spontaneous interpersonal communication that could have been initiated only by the mass-media

advertising. These may be important findings for strategists in the developing countries; that is, brand-name advertising may be the most powerful means of communication, particularly in cultures where the discussion of contraceptives per se appears difficult to generate. Evidence suggests that over 50 percent of the married couples in Sri Lanka--possibly close to one million--knew one year after the program's inception that Preethi was a contraceptive used by men.

Knowledge about Preethi on the part of men in the wet-zone test area (Galle District), which received both educational inputs and mass-media advertising, is compared with the knowledge of men in the control area, which experienced only mass-media advertising. As expected, those in the test area exhibited greater recognition of Preethi. Interestingly, however, per capita purchases of Preethi in the test area remained about the same as those in the control area and surrounding districts. While this probably indicates that mass-media product advertising alone is sufficient to mobilize target couples, sample bias may be involved for the test-area residents, who are reputedly the slowest in the nation to accept almost any new product.

Measures of Cost-Effectiveness

Cost-effectiveness at the output level is most appropriately measured for one calendar year, 1974, since it excludes the abnormally high "selling-in" activity during the first launch month and represents a fairly stable period of consumer purchases. Costs were higher for 1974 than later in the program due to heavy inputs of launch-period advertising and surveys; thus dollar costs reported here are higher than those anticipated for subsequent years. Costs and cost-effectiveness for 1974 are summarized in Tables 2 and 3.

TABLE 2. Preethi program costs: Sri Lanka, 1974 (in US dollars)

| <i>Item</i> | <i>Cost</i> |
|--------------------------------------|-------------|
| Condoms (@\$3.15 per gross) | 83,900 |
| Salaries and consultants | 43,800 |
| Office expenses and travel | 21,800 |
| Surveys | 12,900 |
| Advertising and education* | 88,600 |
| Mail order and packaging* | 29,300 |
| Indirect international costs* | 50,100 |
| Subtotal | 330,400 |
| Less net sales (returned to program) | 19,200 |
| Net cost | 311,200 |

NOTE: All known costs are shown, including shipping, vehicle and equipment depreciation, international travel, evaluation, and PSI head office administration costs. The cost of condoms represents an estimated average for purchases over a period of time.

TABLE 3. Summary of cost-effectiveness indexes for the Preethi program: Sri Lanka, 1974 (in US dollars)

| <i>Measurement</i> | <i>Calculation</i> | |
|----------------------------------|---------------------------|---------|
| Net program cost | | |
| Per capita | $311,200 \div 13,400,000$ | = 0.02 |
| Per acceptor | $311,200 \div 144,000$ | = 2.16 |
| Per couple-year of contraception | $311,200 \div 50,305$ | = 6.19 |
| Per total births averted | $311,200 \div 10,000$ | = 31.00 |
| Per net births averted | $311,200 \div 6,500$ | = 48.00 |
| Advertising cost | | |
| Per knowledgeable couple | $88,600 \div 960,000$ | = 0.09 |
| Per acceptor | $88,600 \div 144,000$ | = 0.62 |
| Per couple-year of contraception | $88,600 \div 50,305$ | = 1.76 |

As shown in Table 2, the net cost of the program for 1974 was \$311,000. The net use was 3.1 million condoms. Assuming an average use of 62 condoms per couple per year, Preethi provided the equivalent of about 50,000 couple-years of contraception in 1974, at a cost of \$6.19 per couple-year, including an advertising cost of \$1.76. The cost for each of the 144,000 new acceptors was \$2.16, including an advertising cost of \$0.62. There was a cost of \$0.09 for advertising and instruction for each couple of reproductive age who learned that Preethi was a contraceptive used by men. (See Table 3.)

We use the accepted ratio of the number of married women of reproductive age to the annual number of births as a fair representation of the number of couple-years of protection required to avert one birth. Using this ratio we can very crudely estimate for 1974 that use of the equivalent of 62 Preethis for each of 4.94 years (306 Preethis) would avert one birth; and the consumption of 3.1 million would have averted about 10,000 births. The cost per birth averted would be approximately \$31. The ratio of births averted to couple-years of contraception would be on the order of 200 per 1,000. Survey results indicated that 16 percent of current Preethi users had previously used equally reliable methods such as pills or IUDs. In addition we have estimated that 15 percent of the births averted by Preethi would have been averted by the continued use of traditional methods. Finally, a net 4 percent had switched condom brands in favor of Preethi. Thus, the number of births averted by the program in 1974 has been reduced by 35 percent (16 + 15 + 4), providing an approximation of 6,500 additional births averted by the Preethi program for that year.

Discussion and Conclusions

The foregoing analysis of the results and effects of Preethi over a short span of time brings to light several strengths and weak-

nesses of the social marketing model. One important advantage is that feedback to management from the field can be obtained very quickly in the marketing model, and policies can be modified accordingly. One example from the distribution chain and one from the advertising program illustrate the ease with which modifications can be made.

1. Improving the retailer's role. Preethi produced an increase in the number of private-sector family planning contact points from 300 to over 4,000 in one year. An ad hoc survey of a sample of these retailers showed good display of the product, but considerable diffidence in retailers' attitudes toward recommending the use of Preethi. Because of their reluctance to recommend the product, a "congratulation kit" was assembled and hand-delivered to each retailer six weeks after the survey was made. The kit contained a letter certifying the role of the retailer as a family planner, a preview of upcoming advertising, and leaflets to be distributed to potential customers. Future surveys of retailers will be needed to ascertain the degree to which these inputs dispelled retailers' shyness about the topic of contraception.

2. Fine-tuning the communication. An excellent response to the first few newspaper ads offering information and samples led to the immediate development of a full-scale mail-order business. Promotional funds were deployed to produce a variety of ads in different media, which brought in more than 130,000 mail requests. Table 4 summarizes results of one test, which measured the relative power of various ads aimed at creating demand for a free booklet. Newspaper ads produced very efficient results, with an advertising cost of only \$0.07 for each response. The most successful ad in the series produced more than 1,000 responses in the first ten days at an advertising cost of less than \$0.03 per response. All respondents were sent literature, as well as a complete "mobilization kit" with motivational information, a Preethi sample, and instructions for use. Total cost of distributing the kit, including postage, handling, and advertising, was frequently less than \$0.30. Tests of direct-mail advertising also indicated good results at a low cost. Contraceptives and information were both given away and sold by mail. It must be emphasized that the Preethi mail-order activities, and all other efforts undertaken throughout the launch period, represented harnessing of indigenous resources. None of these activities was new to Sri Lanka. On the contrary, the use of traditional marketing systems, including use of the postal system, was one of the strongest aspects of the program, providing a quick and powerful impact.

TABLE 4. Summary of cost-effectiveness of advertising campaign for a free booklet by mail: Sri Lanka, 1974 (in US dollars)

| <i>Medium</i> | <i>Advertising costs</i> | <i>Number of responses</i> | <i>Cost per response</i> |
|---------------|--------------------------|----------------------------|--------------------------|
| Newspapers | 1,404 | 21,758 | 0.07 |
| Radio | 8,110 | 25,047 | 0.32 |
| Bus cards | 165 | 401 | 0.41 |
| All media | 9,680 | 47,206 | 0.21 |

NOTE: The \$1,404 used for newspaper advertising represents a fraction of total newspaper space used by the program. The ads appeared frequently in a variety of newspapers. On the other hand, the above figure of \$8,110 for radio represents the total allocation for that medium. A ban on contraceptive advertising by the Ministry of Broadcasting dictated the use of an extraordinary amount for a mail-order offer in order to gain exposure on the air. The ban was lifted in early 1976, paving the way for overt advertising of Preethi by radio.

The Preethi model lends itself to accurate assessment of cost-effectiveness, based on measures of quantities of contraceptives wholesaled, retailed, and used; number of acceptors; and couple-years of contraception. These measures require few assumptions and can be recorded directly, or indirectly using results of community surveys. The same surveys are useful for providing information to management for planning program modifications and improvements, and for defining specific consumer groups for postlaunch-period targeting. However, the fertility information gathered through retrospective surveys is of questionable validity and reliability for translating output data into fertility-change data. Furthermore, the fertility of Preethi users in the absence of the Preethi program could not be ascertained. The same weakness would pertain to benefit/cost analysis, which requires an additional assumption of the magnitude of economic benefits derived from every averted birth. However, it should be possible in Sri Lanka (and in many other countries) to obtain useful data by indirect means for evaluating program impact upon the fertility patterns of a randomly chosen panel of users.

The Preethi program has produced insights suggesting that including the condom in a multi-method program can serve several useful functions. At the method level, it has improved the protection afforded by rhythm and provided a reliable alternative for those discontinuing use of the pill or IUD. At the program level, Preethi has introduced new acceptors to the practice of family planning. In addition, Preethi has played a role in the country's development planning by legitimizing discussion of family planning where it had been blocked by conservative cultural barriers. Furthermore, these effects were accomplished quickly and at low unit costs.

Acceptance of Preethi by 8 percent of Sri Lanka's fertile couples in the first program year, at a cost of only \$2.16 per acceptor, and an increase in the annual per capita use of this contraceptive by a factor of 5 in less than three years, suggest that policy-makers in developing countries should consider wider use of social marketing for the advancement of family planning. Furthermore, the marketing model tends to produce lower unit costs over time. This may make the introduction of similar programs particularly appealing in those situations where program cost is an important factor.

[Extracted from "Measuring the Effectiveness of Contraceptive Marketing Programs: Preethi in Sri Lanka", Studies in Family Planning, Vol. 8, No. 4, April 1977, p. 82-90. Copyright © The Population Council Inc., New York.]



A COLOMBIAN WOMAN SEWING
IN A GARMENT MAKING COOPERATIVE.
(PHOTO: USAID)

Learning, Work and Aspirations

Perdita Huston

[Rural and urban women in six developing countries--interviewed by the author concerning their wants and ambitions as well as some of their frustrations in achieving their goals--identified education leading to cash-earning work as their most urgent need.]

Hands folded primly on their knees, seventeen young women in starched white uniforms sat waiting on a bench outside the Juba hospital one Sunday morning. They were members of the different tribes of southern Sudan, sent to Juba to study midwifery. Few among them were literate. Their only qualification was that the chiefs of their tribes had selected them for the training program. They would return to their home villages after two years of training in conducting normal deliveries and learning the elements of hygiene, nutrition, and infant care. I explained the nature of my visit and requested volunteers for individual conversations: several students raised their hands.

The first young woman I spoke with, a twenty-six-year old member of the Zande tribe, had been married at age eighteen to a man who had two other wives. She had divorced him, even though she was a Catholic, "because he beat me so often." When I asked why she had come to the midwife school she replied: "I wanted to become a midwife because my father and mother are old. My brothers and sisters have not been to school.

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They are only digging in the field. I thought it would be good to become a midwife so I could help my parents by earning a wage. I met some girls who had taken this course, and I saw that they learned good things. Also, if someone becomes a midwife, it will help the country. That's why I have chosen it." I asked the young woman how her life was different from her mother's. "The difference is that I have become cleaner than she is. I used to work hard digging outside and doing everything in the house. I would get all dirty. But I didn't know about hygiene or how to clean myself. Now I know. I will go back to my tribe and teach other women. They have enough water, but they have no knowledge."

I asked her what she thought the women of her tribe needed most to learn. "Women want to learn the new things in health, how best to dig and do the work in the [fields and vegetable] gardens and in the house," she replied. "They want to learn about foods and cooking. I will try my best to teach them." When I asked what work she would have liked to do had she been able to go to school, she told me: "I would have been a teacher--a teacher to help educate others."

The words of this Sudanese woman echoed those of many of the less-educated women I interviewed in Sudan and in the other countries I visited. When they spoke of "education" for themselves, they usually had non-formal training in mind as the primary means of improving their existence in the immediate future. When they spoke of "education" for their children, they meant formal schooling, believing that the opportunity to learn would automatically provide their children with the opportunity to earn in the future. "I must learn new skills or I will be left behind and my family will suffer," they told me. "My children must not remain ignorant like me." Many also expressed their desire "to be able to understand what goes on," "to be able to communicate better with others," "to keep up with my husband," and "to be able to help others."

At the Juba hospital, I talked about education and work with a second midwife student. She was twenty-seven years old, unmarried, and had never attended school, although she had learned to read a little from her brother who was the only literate member of the family. "My life will be different from my mother's. Before, people had plenty of everything. Now they have to have cash to buy things. I will know everything better than my mother; I can work and get money and buy things to help her in her house--show her how to better care for our house. I will earn money after I learn to deliver babies and to care for them and their mothers--after I learn to help other women. I want to learn to teach women to look after their children, to boil water, and to take care of the older

people. That is what they need most. When I have children, I will treat them all the same; both girls and boys will go to school. I want them to have an education. "

Apart from being a need essential to self-esteem and a sense of self-worth, education and "keeping up with the times" is crucial to the development process--to securing the welfare and participation of citizens. The question of the relevance of education to improved welfare--the issue of "education for what?"--was a problem emphasized by many of the women leaders I interviewed. Often, it seems, national education systems were styled after those of the former colonial powers. In many poor countries that have become independent, educational systems have yet to be redesigned to serve immediate national and local needs. Some women, for example, speaking to me of their own educational goals, said they would rather learn how to improve their crops than learn how to read; successful crops were necessary for survival, they said--reading was not. This is not to say that the women with whom I spoke did not want to take part in literacy programs; many explicitly said they want such training. But these women know what they need first to meet their families' most critical, immediate needs, and their response pointed to one of the problem areas of educational "relevance": the usefulness of existing literacy training programs for meeting every-day needs.

As I listened to poor rural women in different countries and regions speak about their many specific learning requirements, I found that they were all interested in training or education for two basic reasons. First, they want to improve the health of their families, for which they seek knowledge and skills pertinent to cultivation, nutrition, hygiene, and health care. Second, they seek training in remunerable skills in order to earn the necessary cash to improve the health and economic situation of their families and to send their children to school. Whenever I asked rural women what they would most like to learn if they had the opportunity, they invariably named several health-related skills: improved ways of growing food for family subsistence, nutrition, cooking, hygiene, health care, budgeting, and family planning. In addition, they wanted several skills that would enable them to earn cash: sewing, handicrafts, new agricultural techniques, and some accounting and marketing skills.

Many of the women I met spoke of training and education as tools to help them emerge from poverty. When, for example, I asked Sophia, the Zapotec Indian woman I interviewed in southern Mexico,

what she would have chosen to learn had she been able to go to school, she replied, "I don't know what exactly, but it would have been something that would earn money. We are very backward here and we don't know anything." The interpreter objected, saying: "That is not true--you know lots of things. You know how to farm, how to cook, how to raise small animals. You know many things." Sophia shook her head in disagreement and replied, "But the problem is that we don't know how to earn money."

Uppermost in the minds of the women who wanted training to enable them to earn cash was the welfare of their children. In Maskeliya, Sri Lanka, a thirty-nine-year-old housewife and mother of six children was one of the many women I spoke with who struggle daily to make ends meet and to assure the education of their children. She told me she knew how to read a little because she had attended school until she was ten years old. Her husband finds occasional work in a local hotel, she said, but his intermittent earnings are not enough to provide for eight people. "We don't have enough to eat--and it is because we have such a large family. But I somehow manage. My father earns a bit of cash, and an uncle works in a laundry and gives me a little money each month. This way I am able to buy schoolbooks for my children. I may be having a lot of trouble now, but I am determined to give my children an education so they won't be in the same kind of situation I am in." Asked what she would study if she were able to attend a training course at this point in her life, the woman replied, "Oh, if there was an opportunity like that I would certainly take up sewing. I could then make garments and sell them. I would be able to earn some money and see to it that the children, at least, come out well in life."

Nearly every uneducated woman I met--whether she lived in a rural or urban area--expressed a yearning for education. Yet a woman's will to learn is not always enough; she must be permitted to learn, to have the freedom to go where the learning is taking place. All too often, the opportunity to do that depends on a father's or a husband's consent. Maggie Gona, a prominent social worker in Mombasa, Kenya, stressed the importance of male encouragement when she spoke of the educational needs of women in the Mombasa area. "Encouragement from our husbands is very, very important. The husbands should not think that because they are heads of families they have all the rights. They must listen to their wives. Whatever women have achieved in this world, they say, has been possible because of the kind of togetherness between a man and a woman. We must start to plan with women. We must start with what they know and then build on to what they need, because if you bring change all of a sudden, you will confuse women

and you will not win the objective you seek. What I believe they need first is education. It is the key to everything else, even for the women who are no longer young. We are lucky to have adult education in Kenya. This is very important. Even if she is not educated, a woman has hands. She can make a small amount of money with handicrafts, using the local materials here. She can sell them to a shop and get paid for them. Then she can buy food for her children. "

Maggie Gona's statement expressed the theoretical and the optimistic side of the coin. Many of the educated women with whom I spoke told of the resistance women in fact encounter when they attempt to learn, or to work outside the home. Traditional attitudes on women's "place" continue to prevent participation in training programs or, thereafter, in the labor force. In a village sixty miles south of Alexandria, Egypt, a young woman I interviewed provided an example of the problems facing women who want to work. Having completed her secondary-school education, the young woman was attending a commercial course offered miles from her home. Covered by a long, black veil, she traveled by train for an hour each morning to reach the distant school. That she was allowed the freedom to do so was a source of pride to her. She appeared pleased to have the occasion to talk with a foreign visitor and spoke about her parents with admiration and appreciation. Yet despite her education, her expectations of life after marriage were limited.

"I am seventeen years old and I attend the second year of a commercial school. This is quite different from the life of my mother. She is illiterate and was married in the traditional manner [to a man she had never seen] at age fifteen. I am one of five children in the family. My father is a grocer. My parents are very close to one another, and they take good care of us. Even though my mother was uneducated, she helped her husband and was a good mother to us. I am engaged to be married. I don't know my fiancé well, but I was allowed to speak with him the day he came to ask for my hand. My parents asked me if I wanted him, and I said yes. I would not have agreed to it if I didn't like him. He has a university education and is in the army.

"I would like my husband to be religious, to take care of his household, to care for his wife, to work well, and to serve his country. My fiancé wants me to continue my studies, but he doesn't want me to work. I would like to, but my fiancée says, 'If one day we need your work, then you can; but if we don't need it, no.' You see, here, when girls finish school, they just go back into the house and don't come out after that. Only rarely are we allowed to go out; but the boys, naturally, are allowed to

go out and about. I would have liked to have been a boy so as to do that. And if I had been a boy, I would have liked to work --to earn a good salary, to do a job the country needs. I want my children to be well-educated, and I want them to have more freedom than I have. "

Many women talked to me about the problem of the "double workday" that burdens the lives of both rural and urban women. When a woman does a full day's work outside the household-- whether it is unpaid work in the field or work for pay--she generally returns home to another full day's work of household tasks that have been the traditional responsibility of women. In Alexandria, Zahia Marzouk--who is president of the city's Family Planning Association as well as an artist, social worker, and former government official--spoke vehemently about this problem: "Men are selfish. They do not share in the work of the home. I made a survey of the problems of working mothers, and I found that very few men among the husbands of 750 working women were helping their wives. Even if we say that working in the house would impair the dignity of the man, there are tasks that would not touch dignity. Taking the children to school--why shouldn't he do that? Or sitting with his children, helping to revise homework? Sometimes the wife even pays half the rent. Why should the man share in her income and not join in helping her do her 'duty' when she is working outside the house as much as he is?"

Many of the professional women I interviewed spoke of the difficulties that women encounter in the workplace itself. Discriminatory practices and attitudes, humiliation, child-care difficulties, male opposition, and unequal pay were just some of their complaints. "I'll give you an example that is rather sensitive. Sometimes the head of a department may use a job as if it were a favor for a certain woman. He may want to make the woman feel that the job was not given to her because it is her right, but only because he arranged it. He is exploiting the woman--getting her in so that he can play with her. If a woman knows that she's employed on her own right and on her own merits, the man will not be able to bother her. "

Barriers to the participation of women in the work force on an equal basis with men exist in rural areas as well. Kenya, for example, many rural women told me that it is easier for men to obtain credit for agricultural or business ventures than it is for women. Credit institutions rarely extend credit to women since, in many cases, women do not hold title to the land they till. In Machakos, Kenya, a businesswoman told me: "The women here are trying to do something for themselves. The problem is that when they start something, they don't have any

capital and it is very difficult. They do many things to get money of their own. Some of them are folk dancers and they perform at public occasions. Others are involved in building a nursery school for cooperative day-care. Still others have opened shops. It all started when we were given plots of land. We started talking and thought that if we formed a group we could create a park. We built it and from that time on we had the feeling that we could work together. We also thought about crafts that would bring money and we found a place to sell our work. It started like that. After one project was finished, we started another. "

This woman's account of how women had begun to work together on self-help projects in her town echoed similar tales I had heard from women in other countries. Like the other women concerned about cooperative work, the Machakos businesswoman commented, "But what women need most of all, I think, is education. Take me, for example, in my work, I need to be able to count, but I don't know how to very well. It is difficult for me. To make any progress, women need to have an education. "

In Mombasa, Kenya, a group of women leaders discussed with me their views on the training needs of women in their area. In all, five women contributed to the conversation, during which they stressed the need to carefully "think through" educational programs for all ages. One said, "We want to teach women crafts so they can earn money, but it is difficult for them to come and learn since they have so many duties at home. And, in the town here, the women are very isolated. " Another suggested, "They need to learn to care for their homes, to cook, and to manage a budget. The budget is the most important thing. Take the case of a woman whose husband earns about 300 shillings (U. S. \$42) and she comes to you and says, 'I have a problem with my husband. He doesn't want to give me money. I need this and that. Can you help me?' and then you look into it and find that the woman has created her own problem because she cannot budget. "

"I think something ought to be done here in Kenya, " another woman added, "so that women could be given a chance. Most of the time they are the providers. You see, in the rural area women have plots of land, and if you've got a plot, you can get food from it. In town, there are no plots of land, so if your husband is earning about 200 shillings [U. S. \$28] and you would like to supplement that by working, there should be a way to let you do that. Women are sewing or embroidering to earn money-- they stitch, make tablecloths--and then they find that they have no

market. I think women need to be educated as to what is needed in the market. First, we should investigate the market, see what is needed, and only then should we teach them to make what is needed. You see, they get discouraged say, 'Why should I go waste my time if nobody buys what I make?' So the problem lies with the leaders. Before you start a group, you must find a market and investigate what things can be sold and where they can be sold. "

"Nothing is properly organized," another woman added. "If there were ways of controlling the handicrafts so that the men would not come into the field as middlemen, then the women really would become their own proprietors throughout Kenya. There would be no men to undercut their work and their earnings. Now, though, the middlemen are making a fantastic profit. They are exploiters--undercutting the women. But who is going to educate the women to take this over?" Another woman spoke up, observing: "We don't educate students as we should. When they have finished their studies, they don't seem to know anything apart from reading books. The time allocated to practical things is not enough to make anything out of them. "

Concern for the education of children was a subject raised by practically all of the women with whom I talked. The advantages of an educated child were often related to the future security of the family and of the child. In Sri Lanka, Kumari Jayawardene told me that in her country the major influence on the changing status of women in the past ten or twenty years has been education. "Education has changed attitudes, too. Now many parents want their girls to work--because of the extra money they need. And the girls themselves, having earned a degree, of course are not willing to go back to the kitchen--or to start making lace and traditional things. Nor are they going out into the field to help on the farm. They are more ambitious, and they want ideas on what they can do, so they can cross all the feudal barriers. There's a lot going on. Women are breaking through. "

[Extracted from Chapter 5 of Third World Women Speak Out, by Perdita Huston. Prepared under the auspices of the Office of Women in Development, AID, in cooperation with the Overseas Development Council. To be published by Praeger Publishers, New York, for the Overseas Development Council of Washington, D. C. 1979.]

Domestic Servants in the Latin American Cities

Elizabeth Jelin

[This paper deals with the migration of Latin American women from rural to urban areas and their occupational and domestic alternatives in the cities. For large numbers of individual migrants, domestic service has been an important means of adaptation to urban life and the urban labor market.]

Urbanization and Internal Migration in Latin America

During the last few decades, the process of urbanization in Latin American countries has been very rapid. This process was accomplished through a high rate of rural-to-urban migration, coupled with a relatively high rate of natural growth of the population. Furthermore, urban growth has been concentrated in one or a few urban centers in each country. Urbanization has been the result not only of fast industrialization that was creating new occupational positions but also of rural economic crises, a very high rate of population growth in rural areas, and the attraction of city life. Industrialization did not keep pace with urbanization; migrants arriving in the cities faced difficulties in the labor market, and relatively high unemployment rates, "dis-guised" unemployment, and underemployment were the result.

In recent years the theoretical and empirical bases for statements on the nature of the urban economy, and its relation to employment patterns

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and labor force participation of migrants, have changed. It no longer seems justified to equate "industrial" with productive and "service" with unproductive employment as had been usual.

Migration and urban-employment patterns of women present a special problem for analyses of the urban labor force, primarily because of the tremendous weight of domestic service as an occupational alternative for young females in cities of all sizes in the region.

Women migrate to cities more often than men. Elizaga reports migration rates by sex for the urban areas of seven Latin American countries and for seven important cities. In thirteen of the fourteen comparisons, migration rates for females are higher than for males, and in the remaining case there is no difference between sexes. One may ask why more women than men in the region migrate to the cities, when authors have continually stressed the importance of such Latin cultural traditions as machismo, a high degree of male control over women, and women's lack of autonomy outside the family. To answer this, one must analyze patterns of migration by age and family position. There are two relevant classes of women migrants: young women arriving alone and, predominantly, looking for jobs; and the ones arriving with their families who will devote their main effort to housework. No doubt both classes are numerically important in most cities. However, the predominant tasks they perform are not so different: the former enter the urban labor force mainly as paid domestic servants, the latter perform unpaid domestic services for their own families.

Women's Work in the Cities

If so many young women come to the cities seeking a job, it must be because there is a demand for their labor. Actually, labor force participation rates among migrants are higher than among women native to the city. Available data show that in Santiago migrant women in all age groups have higher participation rates than natives. Furthermore, recent migrants (arriving during the ten years prior to the survey) show higher participation rates than earlier migrants. The difference is more striking among young women: 57 percent of recent migrants aged fifteen to twenty-four were working at the time of the survey, while 35 percent of the earlier migrants and 30 percent of the natives in that age category did so. The same pattern appears in other cities.

As could be expected, there is also a wide difference in the occupations of native and migrant women and, among the latter, between the recent and the earlier arrivals. Thus in Santiago the proportion of manual workers is highest among recent migrants, intermediate among earlier migrants, and lowest

among natives. Furthermore, there is a sharp difference in the proportion employed as domestic servants: nearly two out of three recently employed migrants, but only one in five earlier migrants, and one in nine natives occupy such positions. An estimate for Lima, Peru, states that 30 percent of all female migrants to the city between 1956 and 1965, representing 62.5 percent of the economically active female migrants, entered domestic service upon arrival in the city. From these and other studies, it is well known that domestic service is a numerically important occupation for women in urban Latin America. What we know now is that this occupation is predominantly filled by migrants to the cities and especially by recent young migrants. As they grow older many of them leave, either to become housewives or to move to other occupations. At the same time, the continuous influx of migrants replenishes the supply of young domestic servants for urban households.

Before approaching the topic of domestic servants in detail, however, it may be necessary to deal with the other important category of women migrants, those arriving in the city with their families, who will devote their efforts predominantly to housework. Information regarding the tasks performed by these women before and after migration is practically nil, and thus one can only speculate about the importance of their move to the city. Is there a systematic pattern of differences in the domestic activities performed in the rural areas of origin and in the cities? The extreme case that could be taken as a standard for comparison is that of a woman performing a wide range of subsistence activities in the area of origin, almost none of which can be reproduced in towns or cities. If there are no alternative employment opportunities for such a woman, she will enjoy "enforced leisure," which will be accompanied by a sharp decline in her family's standard of living, since her husband's income will never be sufficient to purchase all the goods and services she previously produced at home in the country.

Such extremes are not found in Latin American cities. Rural-urban differentials in the extent of cash transactions are not that large, and the variety of domestic subsistence activities that can be carried out in the cities is still considerable. Undoubtedly, the performance of domestic productive activities in urban areas is one adaption of the low-income family to the low wages earned by the gainfully employed members of the household. In low-income families cleaning the house, taking care of the children, and preparing food are not the only domestic tasks urban women perform; they also make and mend clothes, raise animals and vegetables, collect fuel and water. This range of activities may be narrower than that of peasant women, but if these activities

are compared with the monetary value of the same goods and services purchased at market prices, the importance of domestic production in urban areas becomes unmistakable.

Their specialization in housework allows these urban women to enlarge the scope of their activities in a different direction: sewing and mending clothes, washing and ironing, cleaning the house and taking care of children are services that can be sold in the marketplace. Housewives may engage in them for pay and thus derive some income from them. Since the tasks are practically the same ones performed at home for her family and can be performed on a part-time or irregular basis, they are added to the woman's responsibilities, without having to break the household routines or change the family organization. In a manner analogous to that of the subsistence peasant who commercializes part of his/her production in order to earn some money--at times the part sold is a surplus; at other times it means underconsumption for the peasant family in order to obtain some cash--the low-income housewife in a Latin American city can perform domestic tasks for others and thus earn money to supplement (and at times of unemployment to replace) the income of the gainfully employed members of the household. The fluidity of the informal labor market for domestic servants allows for the existence of a number of women who can enter or leave part-time paid employment as a simple extension of their domestic subsistence tasks.

The Domestic Servant in the City

The analysis of domestic service as an occupation in the urban labor market can now be approached from two perspectives: first, that of the domestic servant as an individual worker, her view of her job, and her life cycle; second, the perspective of the urban labor market, focusing on the relationship between domestic service and other economic activities.

Job opportunities in domestic service offer rural women the possibility of moving to the city with a job and thus gaining autonomy away from their families of origin. It is quite likely that many rural families allow their daughters to move to the city just because there are jobs in domestic service available, jobs in which the basic subsistence needs of the young women, food and shelter, will be covered. Furthermore, parents may feel their daughters more secure, morally and psychologically more sheltered, if they live with families instead of having to fight the cold, impersonal labor market by themselves in the city. Thus, in part, the migration of young women to cities is encouraged by the existence of this occupational alternative.

What is the importance of domestic service for the work career, and more generally, for the life cycle of the women involved? Few studies of domestic servants have taken into consideration the perceptions and orientations the women have toward their jobs. Margo Smith studied domestic service in Lima, Peru, and attempted to show that "domestic service provides one of the few opportunities available to lower-class migrant women for upward socioeconomic mobility within the broad spectrum of the lower class." Smith reports data from various studies, including her own, showing the regional, educational, and family background of domestic servants. She also constructs the typical career of the domestic servant:

The typical servant's career follows a distinct pattern. The migrant women destined to servitude spends the first few months following her arrival in Lima with relatives who have previously migrated to the capital. After this initial period of acculturation to the city, these relatives are instrumental in getting the young woman her first job as a servant, often with a lower-middle-class family living in a commercial neighborhood. . . . While receiving on-the-job training, the servant is likely to earn a low salary and receive few, if any, fringe benefits beyond room and board. After six months or a year, the servant moves on to a new job, in a better neighborhood. She usually augments her salary and begins to demand or command fringe benefits. . . . Each of the servant's jobs usually lasts from six months to two years, and it is not unlikely for a servant to have approximately six jobs during the course of her career. . . . Usually, by the age of twenty-four years, or after a seven-year career in domestic service, the servant drops out of the servant world to concentrate her efforts on a family of her own.

Considerable variations are to be found in the career patterns within the city of Lima, and many more if women in other cities are included in a comparison. For instance, in countries like Brazil or Argentina, the career of the domestic servant may include important residential moves, starting as a maid in a provincial city and moving then to the large metropolitan centers of Sao Paulo, Rio, or Buenos Aires. Salaries of domestic servants in Sao Paulo are probably three to five times higher than in the provincial city of Belo Horizonte, a city of more than 2 million itself. This "typical" career provides a good starting point for the discussion on the subject.

Smith contends that the passage through domestic service allows for upward mobility. Actually it is very hard to evaluate this hypothesis, given the lack of available empirical evidence. From the point of view of the work career, domestic service is in itself a dead-end occupation. It does not allow much progress, training, or change. It may in some cases allow a person to obtain some formal training in other skills, permission to study being one of the most important "fringe benefits." In most cases, however, the skill acquired (the most common one is sewing) will not be used in the labor market on leaving domestic service.

A good number of domestic servants are able to leave and enter other occupations, mostly in personal services, at times in industry. But the great majority of women will have as their desired goal marrying, forming their own families, and devoting themselves to housework (perhaps with the actual, although not particularly desired, possibility of having a domestic-service job on a part-time or irregular basis). However, domestic service is a very special occupation; it is a working arrangement that sets strong limits on the choices of the family life of the servant. Establishing a family always means having to abandon the present job itself and many times the occupation also. The conflict between family formation and work, so often discussed for women in general, has not been studied for domestic service, an occupation in which residence at the place of work and long hours create an extreme case of conflict.

Furthermore, a servant's goal of having her own family and thus becoming a housewife may be fostered (with considerable strains and frustrations) by her passage through the household of a higher-income family. For the young woman arriving in the city, entering a middle-stratum household instead of one in a periphery shantytown means having rapidly to become used to a variety of gadgets and habits of a life-style unknown to the migrant. Often the young woman does not know how to use a toilet or running hot water. In less extreme cases, elevators, electric appliances, telephones, and so on are novelties to which one has to become accustomed. Adaptation to these ways of life may include some psychosocial changes that are relatively unknown but important for the study of the servant's future: to what extent does servitude include a sense of idealization and identification with the employers rather than a sense of being exploited and at their mercy? To what extent does this identification hinder the development of a working-class identity, thus isolating the servant from interaction with other workers? What is the range of social interactions and relations that servants can establish in the city outside their jobs--given the long hours, the residential segregation, and the character of their identity?

Are they not prone to developing much higher aspirations and expectations than other members of the working classes?

Domestic Service in the Urban Labor Market

In many senses, domestic service is not a job like others. The person is hired to provide some personal services, but not for a profit--the employer is not "doing business" when hiring a domestic servant. The labor expended during the job is not producing any good or service that will enter the money-circulation process in that society. It is work performed for self-consumption, and in that sense domestic work is more comparable to housework performed by the members of the family without pay than to the work performed by a wage worker. Although it is work for "self-consumption," the self involved is not the worker herself but her employers, to whom only monetary links exist. It may be argued that in this respect it is not that different from the housework performed by the housewife; but the other links between the housewife and the members of her household are lacking for the domestic servant.

In the second place, the fact that the work of the domestic servant is not a part of the production and circulation process in capitalist economies means that there are no limits to the demand for domestic servants. As students of housework (and housewives themselves) know, there is no end to housework. Time-budget studies show the enormous range in the amount of time spent in different domestic activities, varying according to family size, the technology employed for some tasks, the outside employment of the housewife, and so on. Thus, if there is no end to housework, the demand for paid domestic servants has to be extremely elastic, i. e. responsive both to the wage level and to changes in the employers' incomes.

The existence of a constant, potentially unfulfilled demand for domestic service means that, even when the migrant has as a goal some other type of work, she knows that domestic service is always available as an alternative in the city. Thus, as Adriana Marshall has stated, "Employment opportunities and the continuous flow of migrants stimulate each other: the former favor the continuity of the migratory flux, and the latter guarantees a comparatively cheap labor which, in turn, stimulates the demand for labor and the emergence of job opportunities in these sectors."

For the economy and the employment structure, the performance of domestic tasks by means of paid domestic service has other consequences. First, the availability of an abundant and relatively cheap domestic service affects the quality of life of the middle and

upper strata which can enjoy such services. If domestic servants were not available, personal services would have to be purchased from established enterprises (restaurants, laundry and dry-cleaning services, etc.) at considerably higher prices. Thus the use of domestic servants implies some savings for those who can afford them. However, as a source of savings for productive investments, the aggregate effects of domestic service seem negligible, since the saved money is probably diverted more often to other consumption and luxury items than to investment.

Second, the availability of domestic service has some important consequences for the women in the households that can afford them. Although there is no end to housework, the availability of domestic help frees the housewife from many of her domestic chores. In the extreme case, domestic servants can take over the management and organization of the household almost entirely, the housewife only occasionally supervising their work. This means that it may be easier for middle-strata women to enter the labor force or remain in it after marriage and during child rearing without having to carry the full burden of a "double day." Women's participation in the labor force, however, in Latin America and elsewhere, is a complex issue: the availability of domestic service may encourage women to take full-time jobs, but it may also encourage them to conduct a life of leisure and comfort unknown to women at comparable income levels in other countries where domestic service is considerably more expensive.

[Extracted from "Migration and Labor Force Participation of Latin American Women: The Domestic Servants in the Cities, " Women and National Development: The Complexities of Change. Edited by the Wellesley Editorial Committee. Copyright © 1977 by the University of Chicago.]

Four Programs of Employment For Rural Women in India and Bangladesh

Ruth B. Dixon

[This article reviews experience in several South Asian programs specifically intended to mobilize women in productive activities. All have given evidence of economic success and of contribution to women's status, but the difficulties have been considerable.]

The four programs reviewed here are generating new sources of income for rural women in South Asia (see Table 1). All are producers' cooperatives organized into federations, with a potential for reaching tens of thousands of rural women. All but one are self-sufficient economic enterprises with marketable products. However, they differ considerably in the types of services they offer, the socioeconomic and demographic characteristics of their workers, and the organization of the work setting.

The programs are described in some detail in order to convey a little of their flavor and a basis for estimating their impact on rural development and the status of women. These programs, like others, are in a constant state of flux, so that characteristics attributed to them in this report may not hold true at some future date. The discussions which follow are intended not to present some static formulation, but to offer examples of innovative attempts to stimulate a sense of social and economic self-reliance among rural women.

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Table 1. Characteristics of Four Programs for Rural Women's Employment in South Asia

| Program characteristic | Agricultural co-ops in Bangladesh: IRDP federation | Milk co-ops in India: AMUL Dairy federation | Jute handicrafts in Bangladesh: two co-op federations* | Food processing in India: Lijjat Papad co-op federation |
|------------------------|--|---|--|---|
| Income-generating | Some (minor) | Yes | Yes | Yes |
| Rural | Yes | Yes | Some | Some |
| Outside agriculture | No | Part | Yes | Yes |
| Small industry | No | No | Artisanal | Dispersed factory |
| Outside home | Occasional | Twice a day | Occasional | Some twice a day; some all day |
| Young women only | No, all ages | No, men and women, all ages | No, all ages | Some, yes; some, all ages |
| Cooperatives | Yes | Yes | Yes | Yes |
| Services | | | | |
| literacy | Some | No | Some | No |
| family planning | Yes | No | Some | Some |
| child care | No | No | No | No |
| hostel | Training only | No | Training only | No |
| Extra incentives | | | | |
| delayed marriage | No | No | No | No |
| family planning | No | No | No | Yes |

* Jagaroni/Jute Works and the Bangladesh Handicrafts Cooperative Federation (KARIKA)

Women's Agricultural Cooperatives in Bangladesh

In 1972 the government of Bangladesh began a national campaign to eradicate illiteracy, and about 300 people in Rangunia Thana volunteered as teachers, including nearly 100 women who asked why there were no women's cooperatives. They formed the first, with 47 members. The women's cooperatives (like the men's) were modeled on principles evolved at the Bangladesh Academy for Rural Development (BARD) at Comilla. The government's IRDP (Integrated Rural Development Program) took over the administration of the Rangunia Thana Central Cooperative Association (RTCCA) Ltd. in 1973 and subsequently adopted a strong policy of advancing rural women's cooperatives in agriculture and crafts. The IRDP pays the salaries of the local government staff who have important functions in the coops. By December 1975 the number of women's societies had grown to thirteen, with a total membership of 412.

The Rangunia women's groups engage in a wide range of activities which are determined by the women themselves, such as raising ducks and chickens, growing vegetables and fruit, culturing fish, making jute handicrafts, sewing, and manufacturing chicken-wire fencing. These are largely home-based activities for household consumption or for sale in the local community. More distant marketing has fallen to the cooperative federation because women do not yet have the required skills or the freedom to move about.

Of the thirteen women's cooperatives, the largest is Kodomtoli, with seventy-five members. It was formed in 1972 and registered with the government one year later. Members each purchased shares costing 10 taka (70 cents). By December 1975 they had already accumulated savings of 10,000 taka (about \$700), some of it loaned out to members at 15 percent interest, with the rest banked at 7 percent interest.

In a society in which few women earn money directly, how are the initial capital and subsequent savings to be raised? Organizers insisted that members could not simply take money from their husband's pockets; they had to create it themselves. In order to do so, the women began a savings club in which each set aside every day (or every meal, if she could afford it) a handful of dry rice which would otherwise go into the pot for her family. By the end of a month even a daily handful amounts to two seers, worth about 6 taka (42 cents). With many women contributing to a common fund over several months, the rice can be marketed for \$60 or \$70. Each woman was also encouraged to grow vegetables, such as radishes and cauliflower, to eat and to sell. The profits went into an individually credited, but pooled, cooperative savings account.

In early 1975 the Kodomtoli cooperative borrowed 3,000 taka (\$210) in order to excavate a silted pond in the village, stock it with fish, and plant its banks with one hundred banana plants and thirty lime trees. They used money from their own savings fund, losing the 7 percent bank interest but avoiding the 15 percent loan interest that the federation would charge. Originally the tank had been owned by fourteen men. The women obtained permission to excavate and plant from thirteen, but the fourteenth refused their request; he has since been suspected of trying to obstruct the whole project by stealing the first small crop of bananas. The venture has not yet earned income, but a good tank can produce fish worth 6,000 taka (over \$400) in a year, and the harvested fruit will also bring in money.

Although most of Rangunia Thana's residents are Muslim, eleven of the thirteen women's cooperatives are Buddhist or Hindu. Local Hindu families were particularly hard hit by the 1971 war with Pakistan, and many Hindu women were left widowed with small farms to run. They were the first to seek agricultural training. Muslim women, afraid to come forward, asked the organizers to start with the Hindus so that their own husbands could see that no harm would follow. The Muslim men still resist the idea of their wives leaving their bari (household compound), even for weekly cooperative meetings or for tending gardens. Most cooperative members are illiterate, and the few who can read and write need further training in accounting and leadership skills in order to fulfill

their managerial functions. One cooperative discovered it had been cheated by a member's husband who, being literate, had been asked to keep the books. The inspector took weeks to untangle the accounts.

Medina is an assistant inspector paid by IRDP. An unmarried Muslim of eighteen, she earns a basic monthly salary of 120 taka with a 30-taka traveling allowance--just over \$10 altogether. Community social welfare workers, in contrast, earn 300 taka (\$21) per month. By the time Medina pays for transportation from her village to the federation headquarters (RTCCA) three or four days a week, she has nothing left. The cycle rickshaw from her village in which she rides over the rough mud road to the highway, where she catches the bus, costs 4 taka (28 cents) each way. It is not proper for a young woman to walk unaccompanied, and the jeep bus service which picks up men from her village will not take her. In any case, she refuses to ride in the jeep because the men tease her unmercifully.

Medina is an exceptional young woman. Her father--progressive enough to send her to primary school, where she was the only girl--nevertheless wanted to marry her off when she reached thirteen. She appealed to the school's headmaster, who told her father, "Your daughter is not your property to trade as you choose." Her father relented, and Medina went on through grade eleven on a government scholarship.

Whether women can use their agricultural productivity as a base for raising their status significantly may depend on whether they can obtain a monopoly over certain products and whether they can negotiate effectively for good market prices. Really efficient agricultural production and marketing would require considerable additional training at BARD, which would have to expand its services to cater more fully to the needs of rural women. And given the scarcity of land, how are women to acquire additional space beyond their small garden plots?

One village group in Rangunia draws primarily from among unmarried Hindu girls; although not a cooperative, the group sews clothing (mostly for children) from donated and recycled cloth and sells it at low prices to the Rangunia Thana cooperative store. Two groups alternate at the center where the sewing machines are kept, one working the first three days of the week and the other the second three days. The women earn from 20 paise to 2 taka (2 to 14 cents) per garment, depending on its complexity. Most of the girls at the center are past marriageable age, that is, in their late teens or early twenties. Whether their income has induced them to delay marriage or whether they work because they are still unmarried cannot be easily established. One organizer remarked that the

girls are unmarried because they come from very poor families who could not raise a dowry or because they are of dark complexion--a highly undesirable trait in a color-conscious society. On the other hand, their earnings do reduce the economic burden and perhaps some of the shame that otherwise rests on their families for having an unmarried daughter at home. In any case, the non-Muslim minorities of Bangladesh tolerate later marriage for their daughters, and it is primarily these minorities who are recruited into the work programs.

Women in the Dairy Industry:
Milk Cooperatives in India

Almost everywhere in South Asia, women and children bear primary responsibility for caring for milch animals--buffaloes, cows, and goats. They collect fodder for the animals or take them to pasture, wash them or take them to a river or pond to bathe, bring them water to drink, tether them in the sun or under a tree by day and in shelters at night, collect dung to make into cakes for fuel, clean their stalls, and milk them twice a day. The tasks can be highly time-consuming: Pakistani women in one Punjab village spend on the average one hour and forty-five minutes every day caring for animals and an additional three hours and forty-five minutes collecting, carrying, and chopping their fodder. The milk is consumed directly or made into ghee (butter oil) for cooking. Women may sometimes sell a little excess ghee for a few rupees; but if their husbands take it to market, they may not see the money at all.

Women who sell their buffalo milk to one of the 844 village cooperatives of the AMUL Dairy in India's Gujarat State earn cash every day, however, perhaps Rs. 5 or Rs. 6 (55 to 65 cents) on the average. An ordinary buffalo gives about five liters of milk a day when it is not calving, although it can give up to ten and even more in the winter if it is fed the high-nutrient food that the cooperative encourages. Four liters of milk bring about Rs. 8, but special feed costs Rs. 2 or Rs. 3. A survey by the Department of Economics at Sadar Patel University in Anand found that milk money constitutes about half of the household income of families belonging to cooperatives, compared with about 20 percent where they do not. Unlike the sporadic incomes from crops or wage labor, the reliable milk money is paid every day in cash. A woman may sell about two-thirds of what her buffalo produces during the morning milking and one-third of what it produces at night, using the rest for the family's own consumption. The poorest members sell a higher proportion of their milk for cash, however; thus, many children in the area continue to suffer from protein deficiency.

Although women care for and milk the animals, men constitute the majority of the 245,000 cooperative members (perhaps 60 percent); the vast majority of the over 9,000 directors of primary cooperative societies (only a handful of women are elected); and virtually all of the 4,500 or so paid staff members. Only a few office workers among the 2,000 employees at the AMUL Dairy itself are women. The absence of women among staff workers in the villages is said to be due to the low esteem in which such a position is held for women; those with sufficient education would prefer to go into teaching or the health occupations. Working at the center requires contact with men and women of different castes and backgrounds.

One cooperative forms an exception to the underrepresentation of women among members, however. In the village of Khadgodra an all-women's society was organized in 1962 by Mrs. Mehta, the leader of the village council. AMUL did not want to start a cooperative at Khadgodra because it lies near a town that already has a commercial milk buyer. The village men were apparently divided as to whether they should limit their sales to a cooperative, but the women were adamant and formed their own society. By 1975 they had recruited 231 members with an elected all-female board of nine (Mrs. Mehta being the only literate one) and five male staff members. The cooperative had a share capital of Rs. 1,275 (\$140) and had made a profit during 1975 of almost Rs. 17,000, or about \$1,900.

Things went smoothly until November 1975, when the women started to take their milk to a cooperative in a neighboring village instead of their own. They claimed angrily that the male staff workers were not weighing the milk properly and were withholding or delaying payment. The staff men, in turn, claimed they were being paid too little for their work, considering the hours worked and their education. The women avoided firing the wrongdoers because they feared repercussions from the men's relatives. In the confusion, a delegation of men wrote to AMUL, demanding that they should be permitted to join the cooperative, attend its meetings, and take over its management. AMUL sent a team to hold a village meeting at which the issues and charges were discussed. Two of the staff workers, whom all agreed were "making mischief," resigned. By February 1976 the cooperative had started up again, although the matter of whether men could join was still in dispute.

At first, the men typically do not want their wives to go out of the house: they wish AMUL to pick up the milk at their homes instead. When AMUL insists on the use of a collection center, the men often bring in the milk themselves for the first few weeks.

But they soon tire of this task, and the women are sent out-- at first for the morning deliveries--often covered from head to toe and accompanied by a young son. Eventually, they are sent for the evening deliveries too, when it is sometimes already dark. Women carry the milk in shining brass vessels balanced on their heads or hips. After a year, perhaps three-quarters of the deliveries are made by women and the rest by men and children. The importance attached to who brings the milk rests with the scheme of payment. Milk delivered in the evening is paid for the following morning in cash after its fat content has been weighed from a small test sample, and milk delivered in the morning is paid for the same evening. (Standardized payments in all cooperatives are scaled on the basis of fat content to encourage members to feed enriched food to their buffaloes and to discourage adulteration.) Persons from different Hindu castes--some of them untouchables--and men and women alike mingle in the long queues while waiting for their milk to be weighed. AMUL's insistence on a single queue --challenging the established custom in public places of separate queues for men and women--derives from its Gandhian philosophy of eradicating differences among castes and equalizing the status of men and women. (The strategy does not always succeed, however; the women in one cooperative stopped coming to the center because the men teased and pinched them as they stood in line.) The assembly at the collection center often takes on the air of a community meeting, as villagers exchange news of the events of the day.

The greatest advantage of the AMUL Dairy scheme is that it reaches enormous numbers of rural families, for example, 250,000 in over 800 villages in the Kaira District of Gujarat alone. The second great advantage of this plan is that the cooperatives build on and create income from an activity in which villagers already engage. They require--at least at the primary level--little capital expenditure except for building a collection center. The market for milk and milk products would appear to be infinitely expandable, at least in the near future.

AMUL also offers a lesson in what happens when men join cooperatives organized around women's work. Women are under-represented at all levels, but particularly in the management and staff of village societies and at the dairy complex. They are not directly recruited as members in the initial organizational drives. Only in the single all-female cooperative are women managing their own affairs. The most effective solution to their under-representation may be to recruit women only in new societies. Or at the very least, the National Dairy Development Board should hire and train females to join the organizing teams that

it sends into the villages. They would select trainees to be sent to AMUL from all-women's meetings to parallel the sessions for men.

The cooperatives are bound to have a social impact in that women come out of their homes twice a day to gather at the center for conversations with persons from other streets in the village and from other castes--a type of exchange that generally is reserved for the men. Too, everyone's milk goes into the same pot, even that from buffaloes belonging to the scheduled castes (formerly referred to as outcastes, or untouchables). Women learn to orient themselves to a market and to report to the center at a specified time every day. The center could certainly be used as a base from which to offer literacy classes or basic lessons in health care or family planning while the women wait to sell their milk, or at some other more convenient time of day.

Artisan Homework: Jute Handicrafts in Bangladesh

Women in some areas of Bangladesh, Pakistan, India, and Nepal engage in hand spinning and weaving, basketmaking, and fine embroidery (clothing, quilts, wall hangings, pillows, shawls, place mats). Women who produce handicrafts at home typically undervalue their work because they are not used to attaching a monetary value to time, and because they frequently define their handiwork--often interrupted by domestic chores--as an incidental, spare-time activity. The amount of profit is not important--any remuneration at all is better than none so long as the raw materials are paid for. Retailers or export agents who come through the village to buy door-to-door easily take advantage of the women's ignorance of their product's worth and of the fact that alternative markets for their goods do not exist. Nevertheless, if properly organized and remunerated, artisanal activities can provide a healthy source of income for rural women, while drawing on local materials and skills and requiring little capital investment. The organized sector of the jute handicrafts industry in Bangladesh is one such example: Sri Joni is one of its cooperatives.

Akhtari Begum, the secretary of the Sri Joni Mohila Cooperative Society, lives in a stable, Muslim squatter community settled about ten years ago on low-lying land in the outskirts of Dacca. During the rainy season much of the area is flooded; even late in the dry season there is water in the pond where the cattle and children bathe. She began making handbags from jute when the cooperative was organized in 1972 by a Dacca woman interested in providing income for destitute women.

As she talked to me, Akhtari Begum stood in a doorway, deftly knotting fine cord of dyed jute into an intricate pattern with only an occasional glance at her work. Hers is a success story. By working full time with her daughter, she earns approximately 3,000 taka per month--about \$210--a small fortune compared with the average earnings of most Bengali male workers. Her husband quit his \$40-a-month government job as a librarian to help his wife with the business. With her savings, Mrs. Begum bought land in her village, leased it to a tenant farmer, and with the profits from her share of the rice it produced, purchased land near Dacca, where she plans to build a house. Mrs. Begum has four grown sons and an unmarried daughter. At age fourteen, her daughter was betrothed in traditional Muslim fashion, but when the cooperative was formed Mrs. Begum taught her daughter how to make handicrafts too. The girl's marriage was postponed, then canceled. Now she is eighteen, and her parents receive many offers of marriage as word of her value spreads, but neither she nor her parents are anxious to make any arrangements. In any case, Mrs. Begum's standards for a husband for her talented daughter have risen substantially: she now demands a well-educated man with a promising future, even though this will require a considerable dowry.

Mrs. Begum is one of forty women in the Sri Joni cooperative who make jute handbags; an additional one hundred or so earn money from the members by cleaning and braiding the raw jute strands into fine cord. Members earn on the average about 100 taka (\$7) per month by knotting bags in their spare time. The women--most of them married, but some single or widowed--sell the bulk of their products through KARIKA, the Bangladesh Handicrafts Cooperative Federation, which has a shop in Dacca. Some also sell directly to exporters or to retailers in the city. New Market shopping center. That a few Muslim women are now taking their own wares to market to bargain over price is truly revolutionary. In the cultural context of traditional codes of honor by which their mothers lived, a woman would never have dared to leave her home. Some, including Mrs. Begum, have even thrown away their burqas, a garment that completely covers their face and body as they walk in the streets. At first, the women who began jute work were severely criticized by more traditional community members for their irreligious behavior, especially when they moved about outside their homes. Now, four years later, and during difficult financial times, the women are admired and envied for the money they earn.

KARIKA was founded in 1975 by several highly educated Dacca women who were interested in promoting Bangladesh handicrafts.

They organized an exhibition that was widely acclaimed by the public, government, and craftworkers alike. Approximately 650 women now sell their products through KARIKA, a few as individual craftworkers, but most through the fifteen affiliated cooperatives. Aside from jute products, KARIKA sells wood carvings, lacquer work, pottery, leather-work, and cane and bamboo products (most of which are made by men), and embroidered goods, woven articles, shell jewelry, dolls, baskets, and crochet work (most of which are made by women). Federation members are permitted considerable leeway in their work. They are required to meet strict quality control at KARIKA before their goods are accepted for sale, but they can also seek their own markets as independent artisans. KARIKA's staff suggests designs, provides materials on credit where necessary, checks the finished products for quality, and sells the wares. The volume is yet insufficient for export and does not even meet the local demand for high-quality handicrafts from the urban elite and from foreigners.

The Dispersed Factory System: Food Processing in India

The putting-out or dispersed factory system forms an intermediate stage between artisanal and factory production. A merchant or factory manager distributes materials to workers in their homes or small workplaces, prescribes the tasks to be done, and pays for work performed--usually by the piece. Or the work may be performed for a cooperative or association. Unlike artisans, who create a product from beginning to end and frequently sell it themselves, workers in a putting-out system perform part of a total process (for example, the women who shell the shrimps at home for canners in Karachi, or those women who roll bidis for cigarette manufacturers in India) or assemble one component of a product (for example, women who manufacture radio transformers in a Poona cooperative). These workers are usually paid by time or piecework. They may work at home, alone or with family helpers, or in independent or quasi-dependent small shops with other employees. An obvious advantage of the putting-out system is the security of the market; a disadvantage is the existence of usually exploitative wages and unregulated working conditions, especially when the work is done at home.

The Lijjat Papad Industry, with headquarters in Bombay and fifteen cooperative organized production centers scattered throughout India, is a dispersed factory system for manufacturing papads--a light, tortilla-like flat cake made of flour, spices, oil, and water that is marketed in a soft state and fried by the consumer in hot oil to make a crispy snack food or meal accompaniment. All of the 2,700 cooperative members are women, although some of the staff

workers are men. The industry can properly be called a putting-out system because the women perform a single task on materials provided by the central employer: they roll the prepared dough into flat cakes of specified size and weight, and dry them briefly in the sun. Their cooperatives buy all of the papads on a piece-work or time-paid basis.

In the middle of the hot afternoon, the women of Valod--a dusty town of about six thousand Muslim, Hindu, and tribal people near Surat in Gujarat State--come out-of-doors carrying stainless steel containers of papads that they have rolled out during the day. They gather on the porch of their cooperative headquarters, which is housed in a solid brick building draped with crimson bougainvillea. Women and girls talk about the day's events as they queue up, waiting for their papads to be weighed and packaged. They will earn Rs. 4 or Rs. 5 (about 45 to 55 cents), paid daily in cash, for their work--an amount approximately equivalent to what their husbands earn laboring in the fields. Some may earn as much as Rs. 10 to Rs. 15 in a day during the busy season, when papads are in greatest demand for festivities. (The minimum daily wage set by the Gujarat State government is Rs. 3.)

Drawing at first on destitute widows and the poorest of married women when it was formed in 1968, the cooperative now includes more than four hundred poor and working-class women, many of them wives of landless laborers. Most are illiterate; a few, however, are high-school graduates who roll papads because there is no other employment for them in the village. Cooperative members in Valod, as in all the branches of Lijjat Papad, elect a management committee from among the ranks of their own producers; none has outside members either as "sympathizers" or "well-wishers," as many Indian women's cooperatives do. Although the better-educated women tend to dominate decision making, all officeholders must continue to roll papads.

Every morning the women come to the center to collect the dough, which has been prepared during the early hours by paid staff. They carry it home in their containers, and spend four or five hours rolling out papads in tin plates and drying them for a few minutes in the sun, or over a stove when it rains. The women of Valod receive no training because, as one organizer put it, "This skill is in the blood of the people." With 433 female cooperative members and 33 male and female staff members, the papad industry of Valod and its small subcenter in neighboring Golan brought in the startling sum of \$41,000 in cash wages to the village economy in its fiscal year 1974/75. About two-thirds of the households of Valod are said to receive

money from this source, with an average of perhaps one-third to half of their total household income contributed by the women workers.

The papad cooperatives, like the milk and jute cooperatives, work with local agricultural products (pulses, spices, oils) requiring little capital investment at the primary level other than for the production center. The industry organizes the women's existing skills into a marketable commodity, thus generating regular wages from an outside source. It recruits workers disproportionately from the poorest sectors of the population, with favorable consequences to the distribution of incomes within the community. The townspeople of Valod are installing water pumps, latrines, and electricity in their homes, although some improvements are a result of the Vedchhi Intensive Area Scheme as a whole, which integrates most households into agricultural cooperatives, marketing units, and other social and economic programs. The Vedchhi Scheme strongly emphasizes Gandhian ideals of narrowing income gaps by advancing the living standards of the "weaker sections" (including women) and narrowing social gaps by mixing religions and castes in economic activities and in cultural events, such as the yearly feast held for all papad workers and their families where Muslims, caste Hindus, scheduled castes, and tribals alike are in attendance.

When the Valod cooperative was first planned, organizers assumed that production would have to be based in the home if women workers were to be recruited. Now, conditions are quite different. After six years of successful operation, the once-conservative women of Valod move easily through the streets; indeed, when anti-Congress students attacked their cooperative building in 1974, both Hindu and Muslim women came out to defend it. Their employment has expanded their alternatives and improved the bargaining power of landless tribal women remaining in the agricultural sector, who can now negotiate more effectively for higher wages--or, more accurately, for enforcement of the Rs. 3 minimum daily wage set by the state. Nonagricultural employment thus benefits the agricultural population by drawing off its excess workers.

Conclusions

In reviewing four programs in which rural women of South Asia are involved in income-producing activities, one is impressed that rural development appears to be more easily advanced than the status of women. Each of the programs has introduced into rural communities new opportunities for gainful

employment, to which women from the poorest sectors of the population responded most immediately. Men were not displaced from jobs; instead new jobs were organized around activities in which many women already had engaged at a relatively unproductive level. The new income sometimes constituted a major portion of the household earnings: members of the AMUL Dairy cooperatives on the average earned half their household income from milk, compared with 20 percent among nonmember families with milch animals.

Three of the programs infused money into the community from urban or overseas markets; only the Bangladesh women's agricultural cooperatives depended on local markets. The trade-off is that in the same three programs the villagers did not themselves benefit from the goods they produced. Families with buffaloes sold most of their milk for cash rather than consuming it, and they could ill-afford to buy prepared baby foods and cheeses. The jute handicrafts and papads are non-essential items shipped out of the community. Thus, the new employment did not necessarily make villages more self-sufficient in providing for their own consumption needs, but it did create a more effective demand for existing goods and services.

The extent to which new money has developmental consequences, of course, depends on how it is spent. Most women undoubtedly spend their small wages on food for their families or themselves; for, as one observer put it, many experience an "insatiable hunger" from years of deprivation, when as little girls, and then as daughters-in-law and wives, they were the last to eat. Some buy gold jewelry as a form of savings, and clothing, watches, or radios. Husbands sometimes spend the extra money on gambling, pan (betel), or alcohol, all prevalent pastimes, or they might work less themselves so long as the women are bringing in money. But a few women are able to make major purchases of land, a new home, or major home improvements. In addition, all the cooperatives offer or invest in developmental programs of various types. The Bangladesh IRDP cooperatives organize literacy classes, encourage experimentation with new seeds, crops, and farming methods, and make loans available to individual members or groups for new economic enterprises. The AMUL Dairy cooperatives and the papad cooperatives spend part of their profits on community projects, such as roads, wells, and health centers. The programs thus have a spin-off effect that can have far-reaching developmental consequences.

All four programs also appear to increase women's bargaining power in the family by providing a cash income over which they might have some control. At the very least, the employment provides concrete public and private recognition of the value of women's work. Members of all-female cooperatives elected to management positions also acquire decision-making skills that are likely to translate into a more active role in the family. But women in the mixed cooperatives of AMUL Dairy do not participate in the decisions of the enterprise, even though they perform most of the primary labor. All but a handful of the approximately 9,000 managers of primary societies of the AMUL Dairy are men. And, with few exceptions, women play no part in marketing their wares. The exceptions are the jute workers in Bangladesh, who sell sikas and handbags directly to retailers, as well as through their cooperatives; the general rule is that the products--even the fruit and vegetables produced by women in Bangladesh--are marketed by male-dominated or solely male cooperative federations or employers. Most programs do not fully train women to exercise all of the functions of buying, selling, and production for which they could be prepared.

Partly as a consequence of their generally low representation among the main decision-making bodies at work, women appear as yet to play very little role in the affairs of the community at large. Village meetings, when they are held at all, cater almost entirely to a male audience and, except for legally required token representation of women, the villagers elect only men to the village panchayats. The women's political skills need to be further developed before they can share equally in community decisions. One of the major ways of encouraging these skills is through the workplace.

[Extracted from Chapter 3,
"Employment for Rural Women -
Five Programs, " of Rural Women
at Work: Strategies for Develop-
ment in South Asia, published for
Resources for the Future. Copy-
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Rural Women and the Basic-Needs Approach to Development

Ingrid Palmer

[The following article contains a perspective on the effects of production changes on women and suggests that the basic-needs approach to development look at the relationships between the sexes if planners want to increase women's welfare.]

Present methods of introducing commercial crops and technological improvements in agriculture frequently have the effect of increasing women's work burden at the same time as they reduce their rights of control over the returns to family labor, even to their own labor. Since adult rural women, who are almost always mothers, are the focal point of family welfare, not only producing most of the basic requirements to sustain life, but also transforming and delivering them to the point of final consumption, the decline in their status is doubly disturbing. Thus a basic-needs approach to development cannot afford to consider production relations and access to assets at the level of the domestic unit only. It must concern itself with production relations and assets between the sexes as well.

It is difficult to think of a more invisible category of people for planners than rural women, and yet rural women make up the overwhelming majority (70 to 90 percent) of women in developing countries. In those regions of the world where staple food production has failed to keep pace with population (notably large parts of Africa) women tend to be the chief food growers. In other regions (such as Latin

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America) they constitute the majority of migrants to the towns, where unemployment is already high. There is, therefore, a growing concern about the role of women, both as agents and as beneficiaries, in the development process.

The "trickle down" or "oil stain" theories of development assumed that prosperity in one sector, or in one class, would spread gradually to all others. Instead, there is a recognition that if economic growth is to bring a higher standard of living to the most disadvantaged groups in the community it has to be deliberately directed towards supplying essential goods and services and towards the generation of mass purchasing power-- through employment--in order to create the effective demand for them. From this argument has emerged a basic-needs approach to development. (See Development Digest, January 1978, pp. 119-124.)

In technologically underdeveloped rural economies women, rather than men, produce and deliver most of the goods and services required for their satisfaction. These functions are traditional responsibilities of women and as such they can be expected to alter much less rapidly than production relations can be induced to change. Thus what happens to rural women's work, their access to resources, their powers of appropriation of the returns to their labor, as well as their general status during the process of economic change, must be of major concern to anyone propounding a basic-needs strategy. Also evidence shows that in fact women suffer a loss of economic authority and general status during the process of rural modernization, especially agricultural modernization, and it has now become a matter of some urgency to understand why this is so, its consequences, and what can be done to prevent it.

The Burden of Rural Women's Work

Except in the case of women who are the wives of successful farmers, rural women fill their day with a wide range of activities which sustain the household. In addition to five or six hours of labor-intensive preparation and cooking of food, of household cleaning and child care, they may spend several hours fetching and carrying heavy loads of water and fuel without which they cannot wash and cook. If animals are used in agricultural work, the women, and sometimes the children, are usually responsible for taking them to pasture, bringing them back, giving them feed and keeping them clean. On top of all this women may work up to eight hours a day cultivating crops. They almost invariably rise at 4:30 to 5 a. m., perhaps several hours before their husbands, and are usually the last to retire at night.

Several case studies of rural women in a wheat-growing area of Haryana State, India, showed that their average working day (including work around the home) was between 15 and 16 1/2 hours. In households where there was only one adult woman the workload was such that she scarcely had time to nurse her baby. Old women also had a full day, changing their work functions as age advanced. One 75-year old woman was still laboring nearly ten hours a day preparing and making food for sale. In these case studies it was shown that men did not have nearly as exacting a day, being able to find time to smoke or play cards under the trees. The author of these case studies concluded that women's direct contribution to agriculture was not less than 50 percent of all agricultural work, and that if their role in animal husbandry and farm support activities at home were taken into account their contribution would be much higher.

Such harsh work profiles of women, who are frequently nursing mothers or pregnant, go a long way to explain why women's life expectancy in some areas, such as parts of southern Asia, is less than men's, whereas in the developed countries it generally exceeds men's by several years.

Also, contributing to women's burden are absentee husbands in many rural areas of developing countries, especially in Africa. The 1969 census showed that in Kenya about 525,000 rural households were headed by women; some 400,000 of them had male "heads of household" living in towns. The women in these households are left to protect and provide daily necessities for themselves and their children.

But what happens to women's workload and status when technology, specialization of jobs, and commercialization are introduced or become more widespread in agriculture?

The Effect of Modernization on Women's Labor and Earnings

It is far from a foregone conclusion that the modernization of agriculture relieves women of a long hard day. In fact, except for wives of successful farmers, case studies and other reports reveal that modernization has meant more hours worked in the fields by women, whether or not men also worked longer hours. Boserup refers to the Central African Republic where active female household members were recorded as working 15 hours in a "traditional" village but 20 hours in a village where "improved methods" prevailed. Active male household members in the two villages worked an average of 15 and 13 hours a week

respectively. Case studies in the Gambia showed that the average working week for women was 19 hours in the former type of setting and 20 in the latter, as against 11 and 9 hours respectively for men. In another study, relating to Sierra Leone, it was shown that modernization brought a change from roughly equal field work for men and women to longer hours for both but disproportionately more for men; however, it was clear from the data that had housework been included it would have been shown that women worked a much longer day than men.

In Africa, at least, a common factor leading to longer hours for women is that where modernization involves both additional labor-intensive work and high-productivity work, women usually find they are left with the former. "Often the only type of innovations possible for the women farmers are those involving the use of (their own) additional labor, and not those involving the reduction of labor due to mechanization." In so far as they are allocated the labor-intensive, poorly paid or totally unremunerated work, women are being "marginalised" (or pushed out) to the now well-known periphery of the modernized sector. But for women "marginalisation" can mean something worse than for male wage earners or the landless. It can mean greatly diminished access to the returns (in cash or produce) to their own labor, either in absolute terms or in relative terms to the access enjoyed by men. One comparison of women's relative control over income in traditional and nontraditional areas comes from the Ivory Coast. "In the Bouake region only 10 to 35 percent of the family income [in modernised villages] is allocated to women as against 50 percent allocated to them in traditional villages." This substantial drop in women's share of income suggests that their income fell in absolute terms too. However that may be, in this case the introduction of commercial crops, whether groundnuts, coffee, cotton or pyrethrum, and the commercialisation of food staples are known to have had the common effect of reducing women's ability to secure an equitable share of family produce and cash income. Although this phenomenon has been little explored by case studies, it is regarded by some authorities as an almost inevitable consequence of modernization schemes.

There is, however, one documented case study which has described all these negative effects on women: their longer working day, their continued employment in labor-intensive, low-productivity work, and the decline in their control over the family's purchasing power. It is based on a comparison of two villages in Kenya, one traditional and the other a newly settled, irrigated village producing rice.

When the Mwea irrigated rice scheme was introduced the intention was to raise family income by intensive cultivation of rice as a cash food crop which, it was assumed would also be included in the cultivator's diet. Families were moved to the irrigated settlement village and the agro-inputs were supplied, as usual, to the male head of household. There was, of course, no attempt to interfere in the sexual division of labor arising from these major changes. Thus the custom that women are responsible for supplying the household's food continued in the new settlement. But the earnings from the household's cash cropping were placed under the control of their husbands by virtue of the latter's special relationship with the settlement's authorities.

In the new village the plots for growing traditional food crops were smaller and inadequate for feeding the household. Moreover, the women found they were spending much more time on the rice crop. The wives received from their husbands some of the crop in return for their labor, but because the husbands refused to eat rice it was sold in order to buy traditional food. The wives found themselves constantly in need of cash to make up for their inadequate traditional food plots and the reduced time available to cultivate them. Thus this form of agricultural modernization affected women in two ways: they had to work longer hours and they lost the ability to draw on their own resources to provide the family's food. In addition, firewood for cooking was not as easily available as in the traditional village so that its necessary purchase aggravated the women's chronic shortage of now much-needed cash. It became a common practice for husbands to provide cash for three months' supply of firewood a year, a woman being considered lucky if her husband bought her six months' supply.

Husbands were not always present, sometimes returning home only to organise labor at peak work periods, so that the women were left alone to tend both the rice and the traditional food plots. Furthermore, they had been detached from friends and relatives in the traditional village who might have helped them with child care and general support in household activities.

The effects of this disregard for women's interests and of their diminished access to resources, however unintentional, bode ill for the welfare of the household. Statisticians may be able to prove that real family income has risen as a result of economic change, but it requires more than a statistician to explain why, for instance, nutritional levels fall while wrist-watches, transistor-radios and bicycles (all largely utilized by men) find their way into the household.

The Basic-Needs Approach

The basic-needs approach to development has been best articulated in 1976 by the International Labor Organization in the Director-General's report to the World Employment Conference. (See Development Digest, January 1977, pp. 32-42.) This report considers how the family and the community could be helped to satisfy their needs for essential goods and services, which include: adequate food, shelter, clothing, certain household effects, safe drinking-water, sanitation, public transport, and health and educational facilities. The report goes on:

A basic-needs oriented policy implies the participation of people in making the decisions which affect them. Participation interacts with the two main elements of a basic-needs strategy. For example, education and good health will facilitate participation, and participation in turn will strengthen the claim for the material basic needs.

Recognition is given to the contribution of women in providing the essentials of life, and to the fact that these tasks are time-consuming and arduous. The significance of the present full utilisation of women's labor is seen in this way:

There are thus two facets to a basic-needs strategy for women in developing countries. One is to enable them to contribute more effectively to the satisfaction of their families' basic needs, within the framework of their traditional responsibilities. The other, which is a fundamental need of the women themselves, is to ease their work burden while furthering their economic independence and their more equitable integration into the community, beyond the narrow circle of the family.

Especially in rural areas, most women in developing countries are overworked rather than underemployed, and a more appropriate technology for the tasks they perform implies labor saving, in order to improve the quality of their employment, rather than employment creation.

This recognition of women's work burden and of the need to alleviate it with technology is welcome. Unfortunately, production relations within the household are not commented upon, nor are the difficulties of introducing technology into an unmonetised sector. Above all, there is no reference to the importance of creating

institutions specifically directed at women as producers, and not merely as procreators or dieticians or child care practitioners.

The Need for Feminisation of the Development Process

First, while the basic-needs approach recognises that men and women approach the labor market from opposite ends, from underemployment and overwork respectively, its emphasis on providing "adequate" (more remunerative and higher-productivity) employment presents a difficulty. The problem lies in that some economic thinking assumes new technology has necessarily to be directed to new jobs and new processes rather than to old ones. If women are already fully stretched, they are not likely to find themselves in the new jobs. Moreover, since they will probably continue to dominate home-making activity and self-provisioning food production, there is likely to be less inclination to upgrade these old jobs than to create high-productivity new jobs for men, because technology is associated in the general consciousness with wage employment. If this happens, the inequality of the rates of return from labor and the distribution of income between the sexes will become greater. Should planners fall into this trap, the problem of women's equitable integration in development must become more difficult. There may well be a case (justified, for example, by the need to improve the delivery of essential goods and services to the family) for changing women's present "inadequate" employment into "adequate" employment first of all, even at the cost of retaining male underemployment or of creating new "inadequate" employment for men.

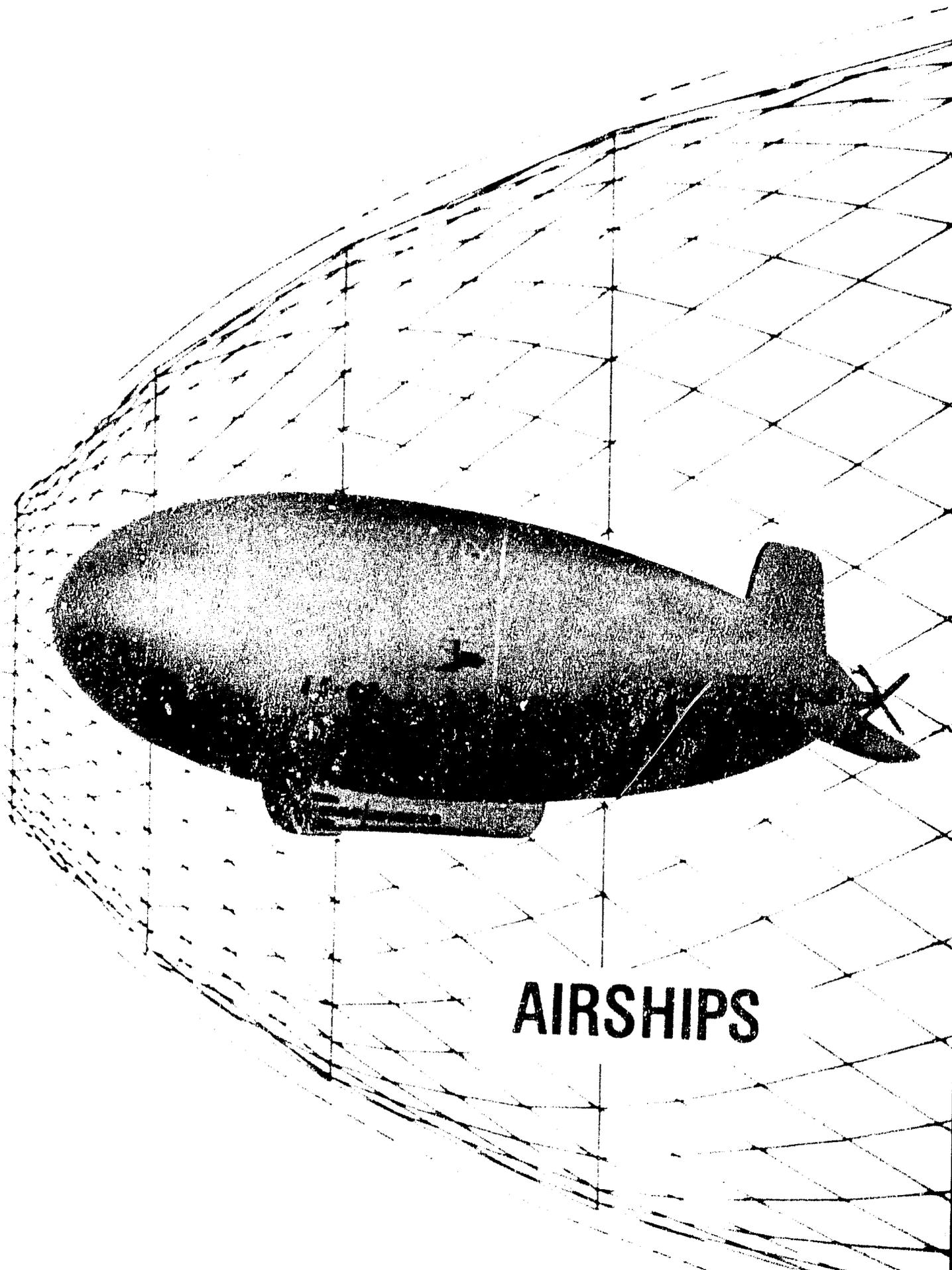
Second, an appropriate strategy must ensure women a measure of authority over family earnings, for this will determine the extent to which the basic-needs approach actually benefits the family, as distinct from the community (through increased employment and production). Women's control over family earnings will likewise determine the composition of goods and services produced, since effective purchasing power will be in their hands. Thus any suggestion that improvements in women's authority and economic independence can be postponed to a later stage of development weakens the basic-needs argument from the outset.

Third, methods of raising the productivity of household work have still to be elaborated. This is unmonetised and unmarketed work (as is self-provisioning food farming) and therefore does not sell a commodity which can return a profit to be invested in the mechanisation of housework. One solution could lie in a

credit policy which embraces both marketed and unmarketed family production. Thus credit might be withheld from commercial crop production until credit for a solar energy cooker has been accepted. In this way the whole family would be regarded as the basic "accounting unit" in which profits on commercial crops are used to subsidise the raising of labor productivity in unremunerated lines of family production.

The concept of the basic accounting unit can also be applied at levels other than that of the individual family: a group of working families could be the accounting unit, or a village, or a commune. Were the unit to be larger than the household, one effect would be to extend and transform the production and monetarized exchange relations found within the household by taking them out of the fief of the male head. In this way inequalities in economic or institutional bargaining power between men and women could be eliminated, while inequalities in labor productivities could be rendered harmless during a transitional stage of development, and then finally eliminated.

[Extracted from "Rural Women and the Basic-Needs Approach to Development," International Labor Review, Vol. 115, No. 1, January-February 1977. Copyright © International Labor Organization, Geneva, Switzerland.]



AIRSHIPS

THE DIRIGIBLE DESIGN, SHOWN ALONG
WITH THE OUTLINE OF ITS RIGID STRUCTURE,
IS THE LS60 OF LIGHTSPEED USA, INC.
(PHOTO: LIGHTSPEED USA INC., NEW YORK)

The Potential Uses of Airships

The airship or dirigible, which is held in the air by a lifting gas (like a balloon) and moved forward by a motor (like an airplane), was once more common than it is today. Rather few have been used for sightseeing, advertising, and surveillance service since World War II. But recently a few people have begun to think about the uses airships might have in at least some developing countries, and interest has started to revive. So far Venezuela has ordered 22 airships to be built over a period of ten years (not delivered when this was written), the first new order for more than a decade, and perhaps a half dozen other countries are considering the question.

The first article to follow tells what an airship is; the second article analyzes several specific purposes for which airships could be used today in developing countries. This introductory statement supplies a general description of their weaknesses and strengths in different uses.

Airships are too large and expensive to be used without good reason to believe that they would have superiority over other modes of transport for some defined purpose. The knowledge and skills required to build them and operate them still exist; but they have not been kept in practice, so that manufacture would be initially more costly to absorb the development costs than it could become later if more of them were made and used. Even a small blimp with a 2 ton payload capacity would cost over a million dollars; the larger airships might be \$25-50 million, with 100-300 ton payload capacity. Probable operating costs per ton-kilometer are harder to predict in general terms, but they would surely be well above those for trucks or buses, railways, or ocean ships.

Total operating and capital amortization costs in various uses must be compared with those of ground transportation, and those of airplanes or helicopters. Factors such as speed, convenience to users, reliability, and dependence on investments in infrastructure must be considered along with vehicle costs in estimating the advantages of different transport modes. The most striking advantage airships can offer is that they do not require a great deal of infrastructure: neither roads nor railroads have to be built and maintained; and unlike airplanes they can land and

take off from any small cleared area. This not only makes the airship cheaper for uses where infrastructure has not yet been built, but it makes for flexibility--it can go almost anywhere without much preparation, which is a great convenience for passengers or cargo shippers. So if these qualities are important, the airship's chief competitor is the still more costly, hard-to-maintain helicopter, which is not as suited to long distance flights as the airship can be.

From this perspective, the next question would be: where does one find the conditions in which the airship's advantages are of value? In the developed industrial countries the construction of roads, railway lines and airports as well as supply facilities for spare parts and the availability of skilled labor, etc. are widely spread. In thinly populated areas this may be less true, but it is easy for the richer countries to build new facilities wherever new needs arise. In the densely settled portions of developing countries rail or road access is usually to be found; many rural roads may not be of the best quality, but where they exist goods and people are more cheaply moved on the ground than in the air. So one must look to the less settled portions of the developing countries to find airship uses. There are two kinds of reasons why transport of people and goods may be needed in the absence of roads: 1) mineral or oil deposits have been found in remote locations; 2) areas with rich agricultural or forestry potential may be unsettled and unconnected. In both cases difficult terrain, and often heavy rainfall, may raise the costs of road building and maintenance to very high levels. For example, a simple, non-paved road in the northeast section of the Amazon costs in the range of \$75,000 to \$90,000 per kilometer to build. The maintenance of this road with tropical rains costs over \$12,000 per kilometer per year. This however does not mean that the road is usable throughout the year. When it rains transit stops for mud makes the road impassible. These remote areas are the most probable areas of comparative advantage for the airship. They are not the only possible uses in which airships might compete if they were more easily available, but they are the areas where the prospect of airship competitiveness could be reliable enough to stimulate the growth of manufacture, and the development of operating and maintenance skills.

For settled areas, airships may find special niches where they are suitable. Their normal cruising air speed of around 100 miles per hour (160 km. p. h.) makes them slower than airplanes but faster than ground or ship movements. For short distances, where speed differences are less decisive, the advantages of ground transport in low cost and availability are usually overwhelming. Airships might compete in cost with planes for long hauls of over 1,000

miles in some circumstances, though not with surface vehicles: if the speed difference from airplanes is not decisive but the speed advantage over surface movement is, as with some kinds of cargo like perishable agricultural products, there might be an opening for airships. There may also be some specialized uses for airships in shorter flights, discussed below. All these applications would require exacting cost estimates; cost components, and comparative advantages, can shift over time.

One final point: if an undeveloped area is to be opened, it could be argued that a road ought to be built so that settlements can grow up along and near it. Even though airship transport may be demonstrably cheaper, faster and easier to inaugurate, the developmental stimulus from building a road will be greater in the long run than that from airship use; this would be because airship transport could leave intermediate areas between terminals in isolated stagnation. Perhaps the best reply to that objection is that both forms of transport may be seen as complementary. Airships can focus on: exploratory stages of growth, on areas where road building is prohibitively expensive, where resources are not expected to last indefinitely (e. g. mines and oil wells), where transport demands are shifting in location or infrequent in given places (e. g. forestry), where various kinds of uncertainty as to soils or other local aspects prevail--in short, in conditions which will not or may not justify road (or rail) investment. While airship service is underway, feeder roads to airship terminals would grow up with settlement; low quality connecting roads may in time appear; and eventually all-weather roads for heavy trucks may become justified. But by the time this occurs, if it does, the airship could have made its contribution: either to the avoidance of premature or unjustified road investments (mistakes are easy to make), or to communications with areas where major roads never will be justified if the airship could be used as an alternative.

Gordon Donald
Editor, Development Digest

The Airship

Mark D. Ardema

[This article describes what airships are, the history of their use, their technical qualities, and the improvements that could be expected if they were built today. It concludes with a brief look at some future possibilities.]

Several decades have passed since the days of the Hindenburg and other large rigid airships. Periodically, there has been nostalgic interest in a possible revival of these majestic vehicles. More recently, with national attention focused on energy conservation and environmental pollution reduction and with the recognition of several unique large-lift requirements for potential missions, the interest has become more intense. In addition, significant improvements have occurred in materials, structures, and aerospace technology in general since the 1930s. It seemed appropriate that an up-to-date evaluation be made of the technical and economic feasibility of airships and their potential role. NASA (the U. S. National Aeronautics and Space Administration), therefore, initiated a "Feasibility Study of Modern Airships," to improve the basis for decisions regarding possible new research and technology programs associated with airship developments. Both the "hybrid" airship, a vehicle which generates only a fraction of its total lift from buoyancy, and the conventional fully-buoyant airships were considered in the Feasibility Study.

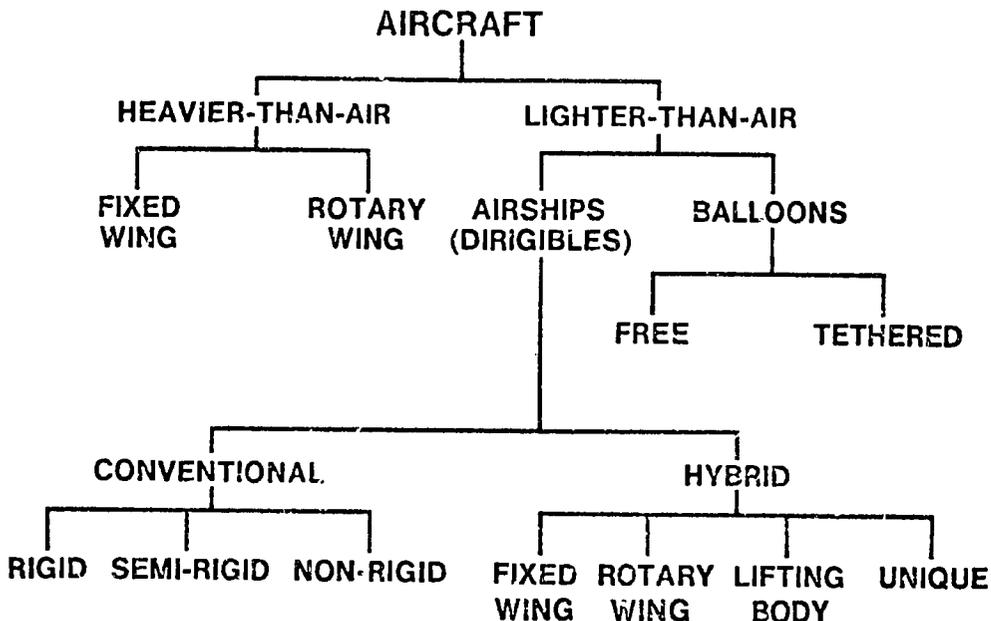
It will be useful to have a clear understanding of the definitions of various types of airships and how

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they are related to each other. For this purpose, Figure 1 classifies the different types of lighter-than-aircraft (LTA). An LTA is an airborne vehicle which obtains all or part of its lift from the displacement of air by a lighter gas. LTAs are conveniently divided into "airships" (synonymous with dirigibles) and balloons, the former having a capability for controlled flight; only airships will be considered here. The term "conventional" applies to the class of approximately ellipsoidal-shaped, fully-buoyant airships which have been developed in the past. It is traditional to classify conventional airships according to their structural concept: rigid, non-rigid, or semi-rigid (the semi-rigid differs from the non-rigid only in having a rigid keel). Hybrid airships are classified according to the means by which the aerodynamic or propulsive portion of the lift is generated.

The Feasibility Study was initiated in December of 1974 and completed by the fall of 1976. There were two prime contractors, the Boeing Vertol Company and the Goodyear Aerospace Corporation.

FIGURE 1 - CLASSIFICATION OF AIRCRAFT

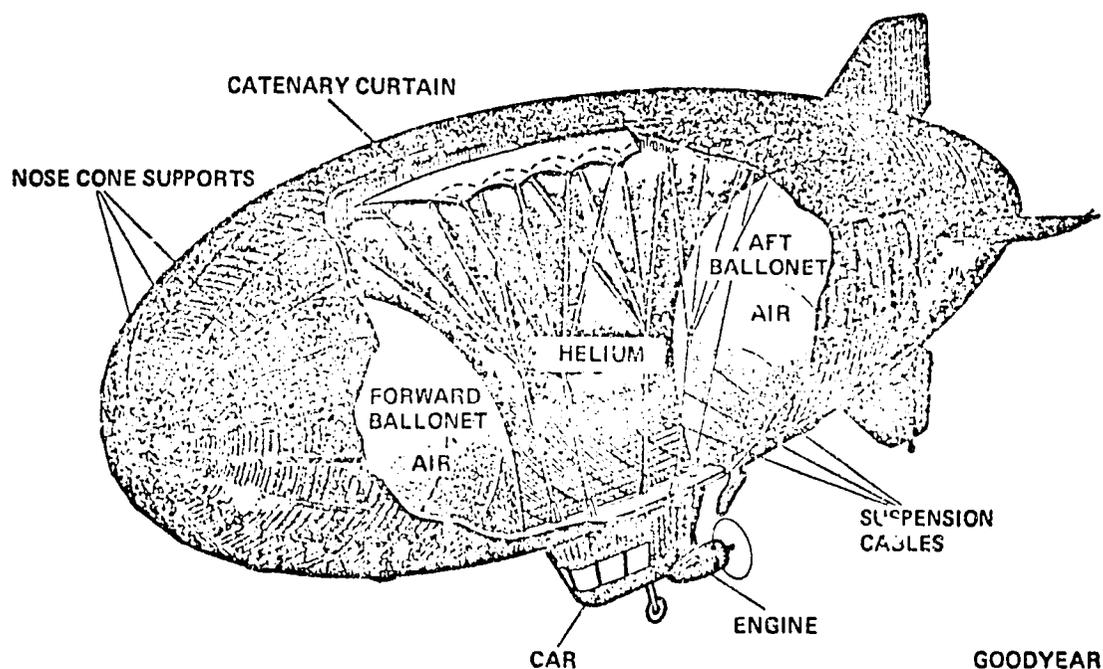


Historical Survey

Past Airship Concepts and Development History. The distinguishing characteristics of the rigid and the non-rigid airship

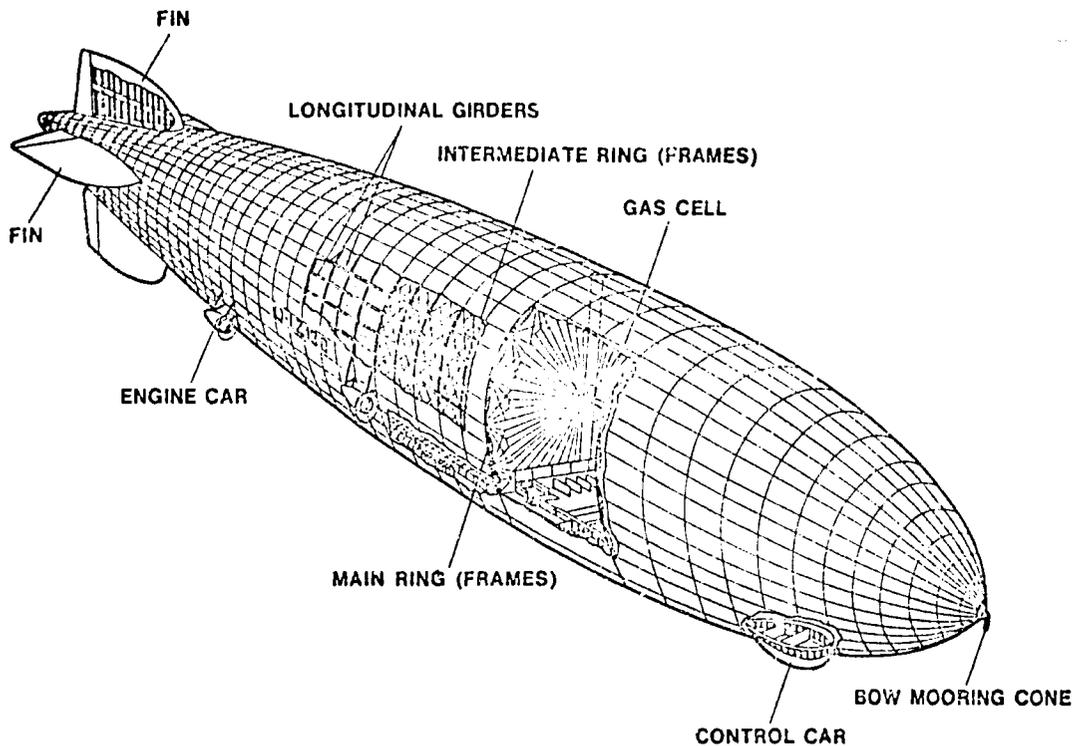
concepts will first be discussed. A typical non-rigid airship is shown in Figure 2. This type of airship consists of a non-rigid envelope, usually fabric, filled with lifting gas and slightly pressurized. Internal air compartments called ballonets expand and contract to maintain the pressure in the envelope as atmospheric pressure and temperature vary. Ballonet volume is controlled by ducting air from the propwash or by electric blowers. The weight of the car structure, propulsion system and other concentrated components is supported by suspension systems attached to the envelope, i. e. by cables running up through the center of the airship to the top of the lift-supported area. (See Fig. 2).

FIGURE 2 - TYPICAL NON-RIGID AIRSHIP



The other major type of airship has a rigid structure (Figure 3). This structure was usually an aluminum ring-and-girder frame. An outer covering was attached to the frame to provide a suitable aerodynamic surface. Several gas cells were arrayed longitudinally within the frame. These cells were free to expand and contract, thereby allowing for pressure and temperature variations. Despite their nearly identical outward appearance, rigid and non-rigid airships have significant differences in their construction and operation.

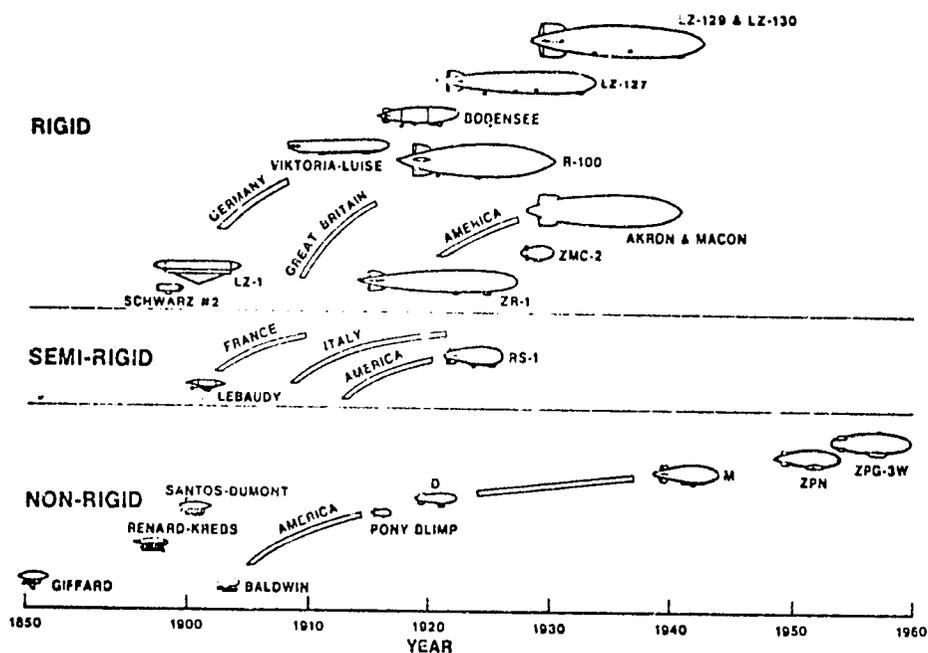
FIGURE 3 - TYPICAL RIGID AIRSHIP



The principal development trends of the three types of conventional airships are depicted on Figure 4. The non-rigids are historically significant for two reasons. First, a non-rigid airship was the first aircraft of any type to achieve controllable flight, nearly 125 years ago. Second, non-rigids were the last type of airship to be used on an extensive operational basis: the U. S. Navy decommissioned the last of its non-rigid airship fleet in the early 1960s. During the many years the Navy operated non-rigids, a high degree of availability and reliability was achieved; most of these were built by the Goodyear Company and a few non-rigids, based on a modified Navy design, are in use today for advertising by that company.

The rigid airship was developed primarily by the Zeppelin Company of Germany, and in fact rigid airships became known as Zeppelins. Even the small percentage of rigids not built by this company were based, for the most part, on Zeppelin designs. The rigid airships of the Zeppelin Company recorded some historic "firsts" in air transportation, including inaugurating the first scheduled passenger air service. The culmination of Zeppelin development was the Graf Zeppelin and Hindenburg airships of the

FIGURE 4 - HISTORY OF AIRSHIP DEVELOPMENT



1930s which were unquestionably outstanding engineering achievements for their day. None of the rigids were in operation by the outbreak of World War II, however.

Technical Qualities and Improvements

Aerodynamics and Design. All three types of conventional airships evolved into a common shape, the familiar "cigar shape" with circular cross sections and nearly elliptical profile. The fineness ratio (length divided by diameter) of the later rigids was typically in the range of 6 to 8. The fineness ratio of the non-rigids, which tended to be smaller and slower than the rigids, was typically in the range of 4 to 5. It is generally acknowledged today that past conventional, fully-buoyant airship designs were very nearly optimum for this class of vehicles in terms of aerodynamic shape and fineness ratio, so that airships could not be expected to show much improvement in this regard. It is estimated that a drag reduction of approximately 10% would be possible with adequate attention to surface smoothness and cleanliness. Use of boundary layer control may give significantly greater drag reduction, but this technology is still relatively undeveloped.

The early airships were designed by primarily empirical methods and the only company to accumulate sufficient experience to design successful rigid airships was the Zeppelin Company.

Two areas in which there was a serious lack of knowledge were aerodynamic loads and design criteria. Work in these areas was continued after the end of the last rigid in the expectation of further rigid developments, and significant progress was made. Improved analytical techniques and better estimates of loads led to improved design criteria which are still useful today.

Structures and Materials. The frames of most of the past rigid airships consisted of built-up rings and longitudinal girders stabilized with wire bracing. The rings and longitudinals were typically made of aluminum alloy and the bracing was steel. This structure was very light and efficient, even by today's standards. However, this construction was highly complex and labor-intensive, and any modern airship of this type would have to have a much simpler construction. Possibilities include the use of metal clad shell, sandwich, or geodesic frame construction. Material would be modern aluminum alloys or, further in the future, filamentary composite materials. A good candidate for wire bracing, if required, is Kevlar rope. It is estimated that use of modern construction and materials would result in a hull weight savings of approximately 25%.

There have been dramatic improvements in soft goods (textiles) with applications for airships in the past two decades. Soft goods are used for gas cells and outer covering for rigids, and for envelopes on non-rigids. The material most often used in past airships for these applications was neoprene-coated cotton; the envelopes of the later non-rigids were made of dacron. Dramatic improvements have been made in the strength of modern soft goods as compared with cotton. Kevlar appears to be the best material, but it has not been fully developed for use in large airships. Use of modern soft goods would result in estimated weight reductions of 40% to 70% as compared with past designs. There has also been a great improvement in coating films, which will result in a tenfold improvement in gas cell and envelope permeability.

The ratio of airship empty weight to gas volume is nearly insensitive to size. This is a reflection of the airship "cube-cube law" (i. e., both the lifting capability and the structural weight increase in proportion to the cube of the length for a constant shape). Since fixed wing heavier-than-air craft follow a "square-cube law," airships will compare more favorably with airplanes as size is increased. Smaller size airships have tended to employ non-rigid or semi-rigid construction, while the larger airships have been rigids. With a few explainable exceptions, past airships have all had about the same efficiency despite differences in design concept, years of development, and lifting gas.

Lifting Gas Selection. A primary consideration for an airship is selection of the lifting gas. The principal factor to be evaluated is lifting capability. It seems clear that the only possible lifting gases are hydrogen, helium, and steam. Other gases which are lighter than air, such as methane, ammonia, and natural gas, have less lifting capability than steam and could probably lift only the empty weight of an airship.

Hydrogen has the greatest lifting capability and is relatively inexpensive with an inexhaustible supply. But its flammability precludes its use, at least at the present time. Because of hydrogen's attributes, development of a fail-safe hydrogen containment system is a worthwhile goal, particularly if helium becomes scarce. The lifting capability of helium is not dramatically less than that of hydrogen, and helium has the great advantage that it is not flammable. The disadvantage with helium is that it is a limited resource. This leads to relatively high prices and possible future availability problems. Although the supply appears adequate for the foreseeable future, large scale use of airships could in time create a serious shortage. All factors considered, helium seems to be the clear choice for lifting gas for airships in the near future, and both contractors assumed its use in their analyses.

The other possibility, steam, has a lifting capability significantly less than hydrogen or helium. The advantages of steam are low cost, unlimited availability, and nonflammability. However, the elevated temperature of the gas requires a containment and temperature control system which is undeveloped at the present time. The elevated temperature also places new demands on structural materials. Because of its relatively poor lifting capability, use of steam will be restricted to airships with low ratios of EW (empty weight) to gross weight (GW). Another gas that is often mentioned is hot air, which has proven to be successful for use in balloons. However, balloons have very low EW/GW ratios because they lack many airship components such as propulsion and control systems. Within the temperature limitations of conventional airship structural materials (about 300°F), hot air would not even be able to lift the empty weight of most airship designs.

Propulsion Systems. Either Otto or Diesel cycle engines were used on the large airships of the 1930s. Modern airships will most likely use turboshaft engines which are highly developed at the present time. Thrusters will be prop/rotors. As compared with engines of the 1930s, these modern engines have about 90% of the specific fuel consumption and as low as 10% of the specific weight and volume. Perhaps more important is the greatly improved reliability and maintainability of modern turboshaft engines. An-

other possibility is a nuclear powerplant, particularly for long endurance missions and large airships, but this would take a long time to develop.

Controls, Avionics and Instrumentation. Flight control systems on past airships were purely mechanical. Commands from the helm (one each for vertical and horizontal surfaces) were transmitted by cable and pulley systems to the control surfaces. There were manual controls for releasing ballast and valving lifting gas. Engine controls of the rigid airships in the 1930s consisted of a telegraph which transmitted engine control commands from the helmsman to an engine mechanic who would then manually make the required engine changes. A modern electronic power management system will eliminate this cumbersome system and greatly increase the responsiveness, accuracy, and reliability of engine and other controls. This system would use many airplane and/or helicopter type components including an autopilot.

There has also been a vast improvement in avionics systems since the 1930s due largely to dramatic changes in electronic communications devices. For example, as compared with 1930 components, modern aviation radio equipment is about one-tenth the size and weight and much more versatile and reliable. Progress in the development of electronic components has also made possible the introduction of many navigation devices not available in the 1930s. Instrumentation on a modern airship would reflect modern airplane instrument technology, chiefly in an increase in accuracy. There will be, of course, a large increase in acquisition cost associated with all these modern systems and components, but this will be offset by lower operating costs due to manpower reductions.

Flight Operations and Ground Handling. The operation of the 1930's airships was as labor-intensive as their construction. In flight, large onboard crews were required to constantly monitor and adjust the trim of the ship and maintain nearly neutral buoyancy. Trim and neutral buoyancy were maintained by one or more of the following procedures: valving lifting gas, dropping ballast, transferring fuel or other materials within the airship, collecting water from the atmosphere and engine exhaust, and moving crew members within the airship. Also, it was not unusual to make repairs to the structure and the engines while in flight. It is obvious that modern structural concepts, engines, avionics, control systems and instrumentation will greatly decrease the workload of the onboard crew.

The experience of the U.S. Navy in the 1940s and 1950s with non-rigids indicates that modern airships can be designed to have all-weather capability at least equivalent to that of modern airplanes. High winds and other inclement weather need not endanger the safety of the airship and its crew, either in flight or on the ground. However, high adverse winds will continue to have a negative impact on the movements of airships due to their low airspeeds.

Extremely large ground crews were needed to handle the early Zeppelins, which were walked in and out of their storage sheds by manpower. Up to 700 men were used to handle the Zeppelin military airships. The Los Angeles needed a 50-man ground crew in ideal weather and 500 men in a 20 mph wind. Subsequent development dramatically reduced the number of men needed for ground handling. The first significant change was the development of the high-mast mooring system by the British. The U. S. Navy then developed the low mast which was more convenient, less expensive, and allowed the airship to be unattended while moored. A "ride-out" car was introduced to allow the ship to "weathervane," i. e., to move around the mast with its nose into the wind. Later, the mobile low mast was employed.

Economics

The flyaway costs per pound of empty weight of the rigid airships of the 1930s were comparable with those of transport airplanes of the same era. Since then, the costs of transport airplanes have steadily risen, even when inflationary effects have been factored out. This is because the steady introduction of new technology has made succeeding generations of airplanes more sophisticated and expensive. This increased cost has paid off in increased safety, reliability, and productivity. As discussed above, a modern airship would have several systems and components which are highly advanced compared with 1930s technology. Thus it seems likely that rigid airship flyaway costs would follow the general trend of fixed wing aircraft, so that a modern rigid airship would cost about the same as an equivalent-size modern airplane. One of the study's contractors, Goodyear, projected that for large airships flyaway costs will be less than for airplanes.

The only significant past commercial airship operations were those of the Zeppelin Company and its subsidiary DELAG. None of these commercial operations can be considered a financial success and most were heavily subsidized by the German government. For the DELAG operation of 1910-1914, for example, when

seven airships offered local pleasure cruises, revenues covered less than half of the operating costs. The LZ-120 operation of 1919 operated at a loss despite a load factor of 100%. The transatlantic service with the Graf Zeppelin in 1933-1937 (590 flights between Germany and Rio de Janeiro) required a breakeven load factor of 93-98%, a value that was seldom achieved. Throughout most of these commercial operations there was little or no competition from heavier-than-aircraft. However, airplane technology was making rapid strides and airplane speed, range, and productivity were rising steadily. By the time of the Hindenburg disaster in 1937, it seems clear that the most advanced airplane, the DC-3, had lower operating costs as well as higher cruising speeds than the most advanced airship, the Hindenburg. Of course, this tended to be offset by the Hindenburg's greater luxury and range.

An extensive design and economic study conducted by Goodyear in the mid-1940s showed that a fleet of advanced, large airships would be competitive with the airplanes of that era for both passenger and cargo applications. But with the vast improvements in transport airplane efficiency and productivity since that study was undertaken, this conclusion would probably not be valid today. Gains in the productivity of conventional airships over the last 30 years would be relatively small because cruise speeds would be essentially unchanged.

Analysis of Possible Vehicles for Future Development

The Feasibility Study included an examination of the engineering relationships that could be applied to a wide range of potential aircraft, including both the conventional fully buoyant airship and a number of possible hybrids depending on both lifting gas plus some kind of aerodynamic or propulsive lift. [Only a few points from this highly technical analysis will be presented here.]

Boeing selected six different types of airship hybrid vehicles for intensive analysis, indicated in Figure 5. Of these the Boeing helipsoid concept proved to have the probability of highest productivity, defined as speed times payload; generally the hybrids had estimated speeds around 150 miles per hour, while airships were plus or minus 100 mph. Boeing focused more on the longer distances (around 2,000 miles) and 50-100 ton payloads. Goodyear, on the other hand, ended its analysis by proposing further study and development of two shorter-range concepts, shown in figures 6 and 7.

FIGURE 5 - CONCEPTS SELECTED FOR PARAMETRIC EVALUATION

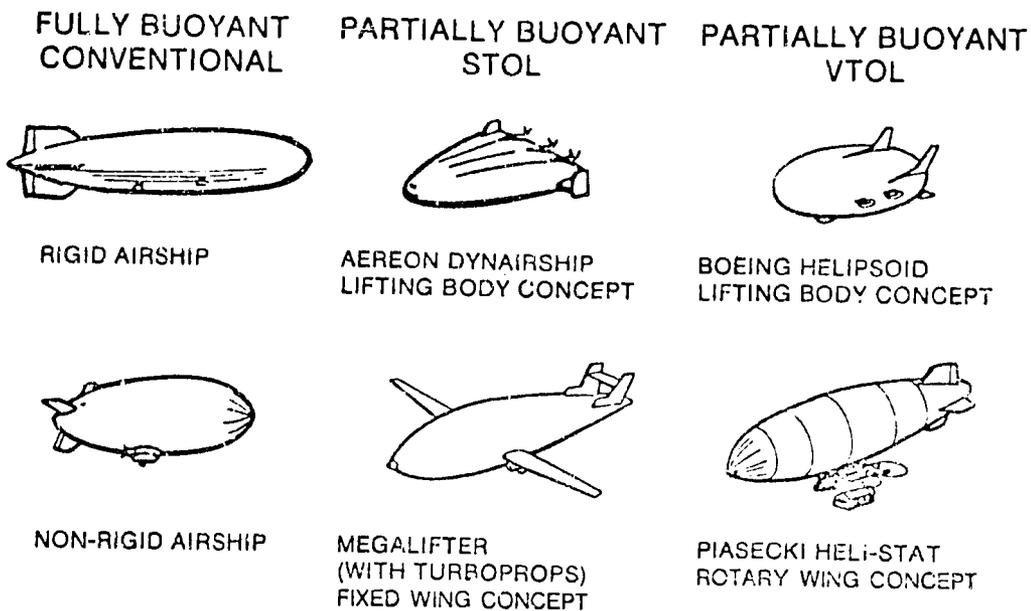


FIGURE 6 - AIRPORT FEEDER CONCEPT

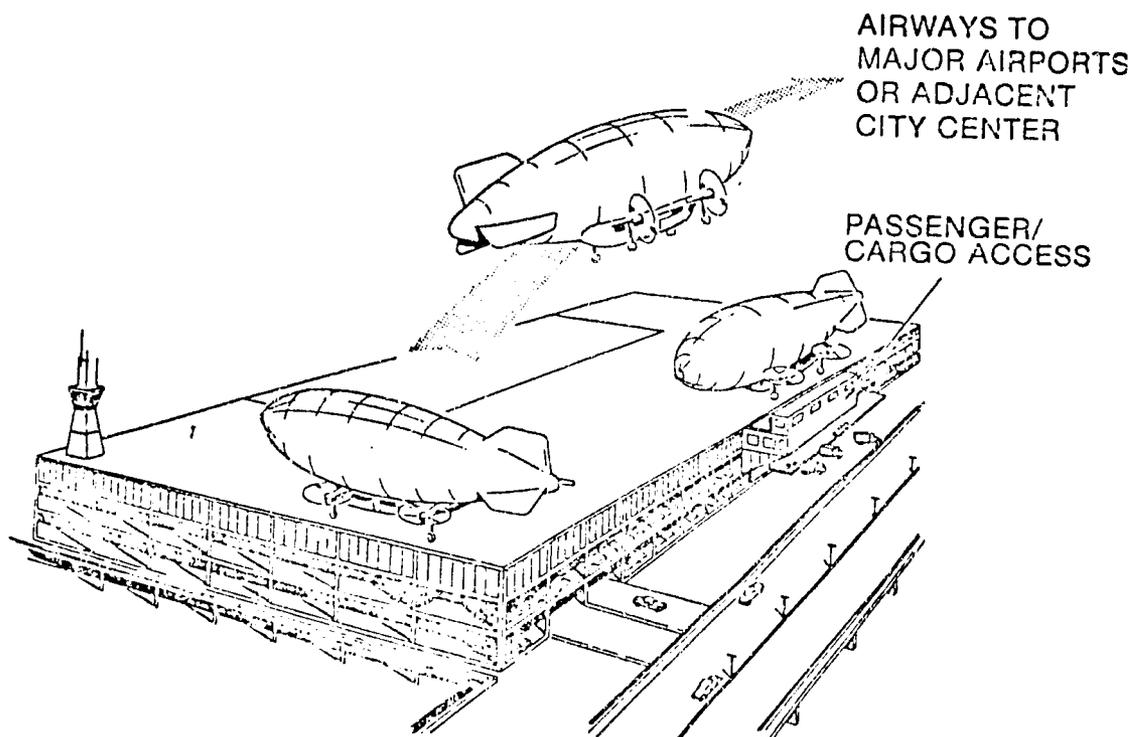
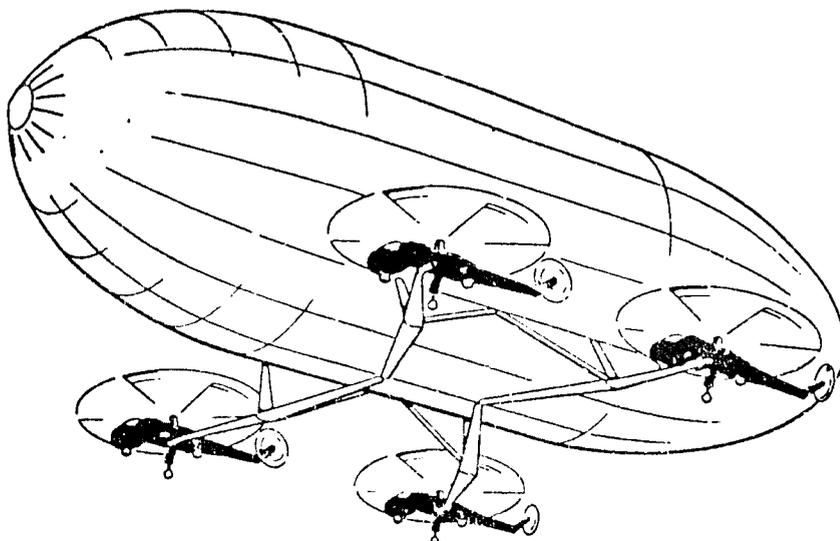


FIGURE 7 - HEAVY LIFT CONCEPT



The first was a relatively small metal-clad airship for use as a feeder of passengers and cargo to and from airports in areas where low-noise and low-pollution requirements would favor the airship in competition with planes or helicopters. The second concept was a "Heli-Stat," an airship assisted by four helicopters intended for lifting very heavy loads, too wide for normal road or rail transport, over relatively short distances. Its weight lifting capabilities would be far in excess of anything in existence today. Some applications for such a vehicle could be: delivery of nuclear and conventional power plants, or delivery of modularized houses and bigger buildings. Other possibilities are the transport of logs from remote timber areas lacking roads, and the loading and unloading of containers from ocean vessels.

[Extracted from a paper presented to the 9th Scientific Balloon Symposium of A. F. G. L. at Portsmouth, New Hampshire, October 1976.]

Rules for Airships In Economic Development

George J. Beier
Gerardo Cahn Hidalgo

[Where surface routes would be unusually expensive or circuitous, or if the market size is too small to spread infrastructure costs of conventional transport, then airships of tested technology present a workable alternative to conventional transport modes. The paper argues from a series of particular cases; though unusual, these cases are not unique.

Two quite different cases will be analyzed here: the application of large airships of over 100 ton load capacity for long distance transportation; and the utilization of smaller airships to haul small cargoes for relatively short distances.

Cost Characteristics of the Airships

In order to proceed with a cost comparison of the airships against the conventional modes of transport, several assumptions are necessary. For the most part these are embodied in the data in Table 1.

(a) Cost of Construction: We have no recent direct evidence on capital cost for a large airship. Research and development are only counted as very minor cost elements; we are simply attempting to estimate how much the cost of construction has increased over the years since it was actually performed. The basic design and operating

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characteristics are well-known. Dr. Eckener, in 1952, estimated the cost of a new Hindenburg at \$7.7 to \$12.5 million, i. e. from \$68 to \$110 per kg empty weight (i. e. weight without cargo). We have assumed a present (1974) construction cost of \$200 per kg empty weight for the large airship--about three times Dr. Eckener's low estimate. This seems about an adequate allowance for increased cost since 1952. For the smaller airships (2 tons and 15 tons), we assumed a construction cost of \$300 per kg empty weight, in accordance with the average cost estimates given by manufacturers for airships in this size range. Since they are intended for use in more difficult terrain, with many take-off operations, these airships will have to be more maneuverable and need a higher power/weight ratio than the larger ship.

(b) Interest and depreciation: Throughout the paper we assume a 10% interest rate for all alternative transport investments. We assume a 20 year life for the large airship and a 10 year life for the smaller airships, in recognition of the rougher jobs envisioned for the latter. A 20 year life may be near the outer limit of reasonable assumptions for the large ship; but it is not clear that successful airships in this class, e. g., the Graf Zeppelin, were anywhere near the end of their useful life when they were scrapped for want of helium.

(c) Flight time: We assume that the large airship could fly 6,000 hours a year. By way of comparison, the Hindenburg flew 2,810 hours in its first nine months of service, an annual rate of 4,215 hours. The use we are considering is a regular, shuttle type operation and the 6,000 assumption should not be too optimistic in these circumstances. For the smaller airship, in rougher terrain with irregular loadings, we assume a 3,000 hour per year performance--roughly a day-time only schedule.

(d) Locations: We assume that the large airship will be operating under favorable conditions of climate and terrain without interruption. The small airships would operate from small bases at approximately 700 meters altitude.

The large airship is patterned on the Hindenburg, one of the largest airships ever in operation. It was a rigid structured dirigible with a gas volume of 216,000 cubic meters, a static gross lift of 206,400 kg, empty weight of 113,000 kg and useful lift of 93,000 kg. S. L. T. A. Inc. has made a series of estimates on the characteristics of a modernized Hindenburg, which we shall call the "H2". The H2 is similar in design to the Hindenburg, but is increased in length and in diameter by 10%; there is no radical technological change. The enlargement increases the volume of the H2 to 266,000 m³, and the gross lift to 266,000 kg.

Incorporating modern structural materials, lighter engines, and modern advances in gearing, the H2 should be able to achieve a slightly better static efficiency than its predecessor: we have assumed a useful lift equal to empty weight 133,000 kg, using helium as the lifting gas.

On these assumptions, the cost estimates of Table 1 were prepared.

TABLE I
COST CHARACTERISTICS OF THREE AIRSHIPS

| Carrying Capacity | H2 | smaller ships | |
|---|--------------------|---------------------|--------------------|
| | 133 ton airship | 15 ton airship | 2 ton airship |
| Airspeed (km hr) | 129 | 130 | 130 |
| Ground Speed (km hr) ^{a/} | 113 | 110 | 110 |
| Distance studied (km) ^{a/} | 1,290 | 220 | 220 |
| Flight duration (hours) | 11.4 | 2 | 2 |
| Horsepower required | 4,937 | 1,700 | 1,000 |
| Fuel required ^{b/} (kg per trip) | 11,256 | 680 | 400 |
| Payload (metric tons) | 121.7 | 11.25 ^{c/} | 1.50 ^{c/} |
| Productivity in ton-km per hour | 13,752 | 1,238 | 165 |
| Personnel and Maintenance cost (\$/hr) | 150 | 83 | 43 |
| Personnel and Maintenance cost (¢/ton-km) | 1.09 | 6.7 | 26.1 |
| Fuel cost (¢/ton-km) | .84 ^{d/} | 2.7 ^{e/} | 12.1 ^{e/} |
| Direct operating cost (¢/ton-km) | 1.93 | 9.4 | 38.2 |
| Yearly capital recovery charge (\$ million) | 3.12 ^{f/} | .68 ^{g/} | .31 ^{h/} |
| Yearly payload (million ton-km) | 82.51 | 3.71 | .50 |
| Capital Charge (¢/ton km) | 3.78 | 18.3 | 62.0 |
| Total Cost (¢/ton-km) | 5.71 | 27.7 | 100.2 |

a/ Average distance of trips considered in the main comparison study.

b/ 0.2 kg per hp per hour.

c/ Assumed 75% load factor.

d/ Price per kg, April 1974 price FOB Matadi.

e/ Price per kg \$0.10.

f/ Cost \$26.6 million, depreciated over 20 years at 10% interest.

g/ Cost \$4.20 million, depreciated over 10 years at 10% interest.

h/ Cost \$1.89 million, depreciated over 10 years at 10% interest.

Source: Based on data furnished by Studiengruppe Luftschiffbau und Anwendungsbereiche.

Use of the H2 in the Zaire Export/Import Trade

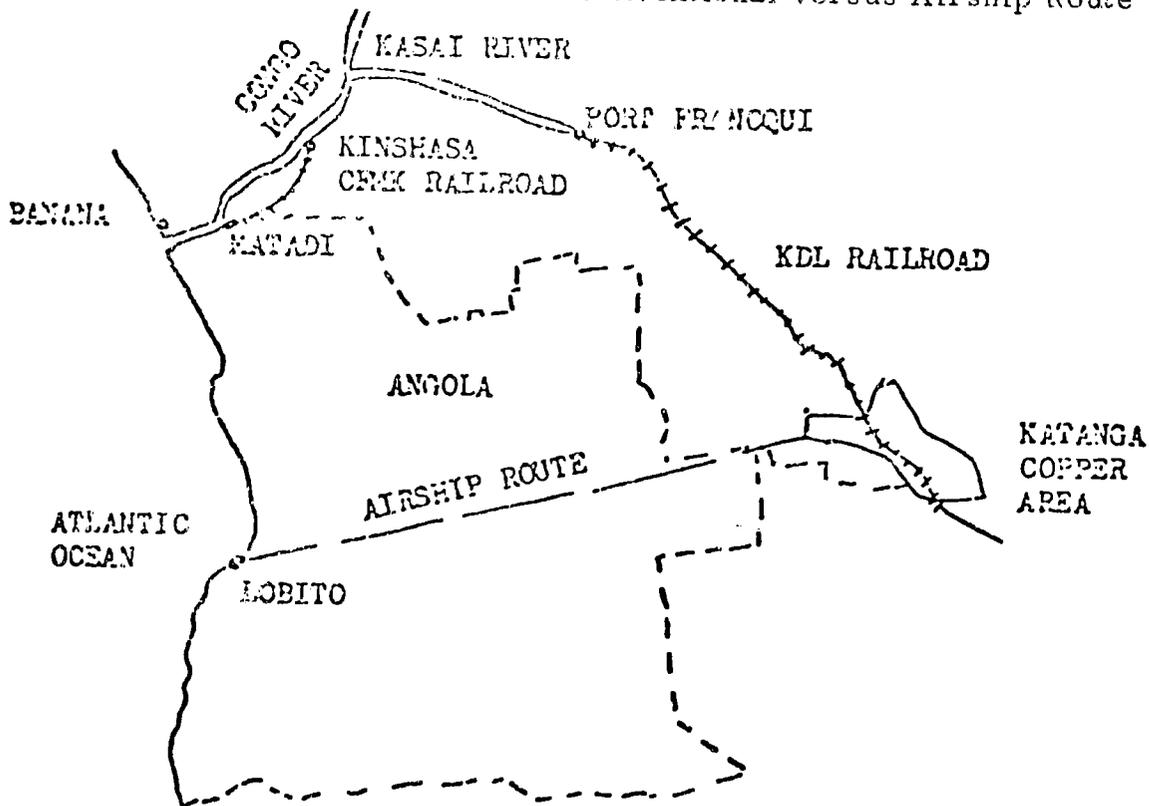
The cost calculation for the H2, shown in the first column of Table 1, was derived to approximate the cost per ton-km of a shuttle service

for moving copper from the Katanga in Zaire to an Angolan Atlantic port, Lobito, and the return of general cargo to Katanga, a stage length of about 1,290 km. Adequate balanced bulk cargo traffic is generated on this route to insure a virtually continuous full load operation. Hence the 100% load factor implied in the Table 1 calculations. The operating conditions on this route are nearly ideal: moderate temperatures and low land elevation.

To compare the cost of the H2 against conventional modes of transport, we calculated the cost per ton via airship over the 1,290 km stage length from Katanga to Lobito: \$73.6 per ton (5.71¢ per ton-km times 1,290 km). The first set of costs against which to evaluate the performance of the H2 are the short run costs of conventional transport modes: the direct operating cost of vehicles (railroad rolling stock and river fleets); the cost of administration, repair and maintenance of infrastructure that vary with use of the infrastructure; the depreciation and interest cost of the vehicle fleet. Specifically excluded are any construction or capital charges for infrastructure, or any charge for fixed administration or maintenance.

The existing transport route we are considering is composed of three parts: the Kinshasa-Dilolo-Lumumbashi Railroad, from the copper areas of the Katanga to Port Francqui (1,430 km); a river barge portion from Port Francqui to the Port of Kinshasa (800 km);

ZAIRE COPPER TRAFFIC - Conventional versus Airship Route



and a further railroad, the Chemin de fer de Matadi Kinshasa, 366 km from Kinshasa to Matadi, the port on the Congo river with access to the Atlantic. The cost characteristics of the present modes were studied in a major work published in 1971 by the French consulting firm BCEOM. Without updating for the inflation since then, except to take account of the increase in fuel prices, we obtain the following cost estimates (Table II).

TABLE II
OPERATING COSTS OF MATADI-KATANGA TRIP, CONVENTIONAL MODES

| | US¢ /ton km | KM | \$/ton |
|---|--------------------|-------|-----------------|
| Katanga-Port Francqui (rail) | 2.86 ^{a/} | 1,450 | 40.89 |
| Port Francqui Trans-shipment | | | 5.95 |
| Port Francqui-Kinshasa (river) | 0.92 | 800 | 7.36 |
| Kinshasa Trans-shipment | | | 5.95 |
| Kinshasa-Matadi (rail) | 1.75 ^{a/} | 366 | 6.40 |
| Total Operating Costs | | | <u>66.33</u> |
| Inventory Cost of Goods in Transit ^{b/} | | | 5.04 |
| Total transit cost exclusive of infrastructure investments costs (per ton/trip) | | | <u>\$ 71.59</u> |

Source: BCEOM, Etude de Transport de la Voie Nationale, October 1971.

a/ To update the fuel price changes, the fuel component in marginal cost for the two railways was multiplied by a factor of 3.715, the latter being the ratio of gas oil prices in 1974 (\$117 per metric ton CIF Matadi) and 1971 (estimated at \$31.50 per metric ton CIF West African ports).

b/ An interest rate of 10%, a copper price (FOB Matadi) of \$1,624 per ton, and a bulk goods price (backhaul cargo) of \$200 per ton, were used to calculate the inventory cost for 20.2 days (the average trip time from Katanga to the port).

A comparison of the two modes shows that there is a very slight difference between the costs (less infrastructure costs) of conventional modes of transport (\$71.6 per ton) and the total costs (including construction costs) of the H2 (\$73.6 per ton). Turning the analysis on its head, we calculate that the H2 would just break even against conventional modes for the trip from the copper fields to an Atlantic Port if the H2 could be built for about \$25.5 million instead of the \$26.6 million which we assumed.

The inclusion of a reasonable allowance for infrastructure investment, on the other hand, would make the airship's cost advantage very striking. Relying again on BCEOM data, the cost per ton for the trip Katanga-Matadi, on a full cost basis, would be about \$20-25 per ton higher than shown in the comparison. In other words, on a total cost basis for both modes, the airship is about 25% cheaper (\$73 per ton vs \$95 per ton). The full cost comparison is not very precise; the BCEOM

estimate refers to full cost of past investment rather than the full cost of future investment which might be avoided by use of airships. But it is not unreasonable to assume that the BCEOM estimate is less than full future cost. The list of conventional investments required to handle increments to traffic is indeed impressive, totalling from \$148 million to \$266 million, at 1971 prices, for the period to 1990 depending on the assumption concerning use of foreign routes. The bulk of this investment might be avoided or postponed for many years by use of airships.

A few other features of the comparison of costs between conventional modes and the H2 seem worthy of special note. The competitiveness of the airship against conventional modes without infrastructure cost depends on the much longer surface route. This suggests that at the present state of the art the airship will not be generally competitive for bulk loads in cases where surface infrastructure is adequate and the trip is fairly direct, but that the flexibility of movements may tip the scales in favor of the airship when the surface route is indirect. Second, higher fuel prices make airships more competitive rather than less so. Fuel costs are only about 15% of total airship cost; the bulk of the cost is the capital charge. At 1974 prices fuel is in the neighborhood of 35% of operating costs for the competitive modes. Our comparison will hence be more favorable as oil prices increase, less favorable with a decline in oil prices. Third, inventory costs, even for a commodity as expensive as copper, do not turn out to be very important relative to other transport cost items.

We have made this comparison only to, not through, the port because we have no basis for a comparison of ports costs for the H2 and conventional modes. No airship has ever undertaken this type of commercial freight operation. But it is generally believed that port costs could be lower for the H2. Using the airships' ability to operate from a sheltered water base, the H2 might unload onto a special purpose barge, and pick up return cargo, without ever using the normal port facilities. It seems quite clear that this will always give the airship a decided advantage over other air transport because conventional airplanes with a landing site away from the port require at least one more transshipment and a short surface haul. In normal circumstances, transshipment to ships from the H2 would probably be cheaper than transshipment from rail.

There are other examples of sizeable mineral deposits discovered in areas much less well connected to markets than Katanga. For example, a rich deposit of nickel lies very shallow (for open mining) near Rustava in Central Burundi; potential output might be 30-50,000 tons a year. Connecting roads may cost some \$45-50 millions; a rail connection would cost perhaps \$300 million. In such situations the case for airships becomes even stronger.

Use of H2 for Exports of Horticultural Products from Kenya to Europe

An often mentioned possible mission for airships is the intercontinental shipment of fresh produce. For our example, we investigated the possibility of increasing the vegetable and fruit shipments from East Central Africa to Europe--specifically the shipment of such goods from Nairobi to London. At Nairobi-to-London backhaul rates ranging from \$.35 per kg (the most favorable contract rate) to \$.48 per kg (IATA rate), the transportation of produce by air increased from just over one thousand metric tons in 1969 to 6.5 thousand metric tons in the first nine months of 1972. The 1972 traffic experienced shortages of cargo space at backhaul rates, and the growth of this traffic is expected if transport at these rates can be expanded. Sufficient volumes already exist to employ an H2, and traffic can be expected to expand.

The cost per ton-km at backhaul rates (for comparison to Table I) ranges from 7.08¢ (IATA rates) to 5.16¢ (contract rates). As Table I shows, the cost per ton km for the H2 in virtually ideal conditions is 5.71¢. Even after increasing estimated costs by about one-half to compensate for less favorable operating conditions, the H2 could still deliver at rates in the general neighborhood of the 1973 IATA backhaul rates.

The H2 presents a transport alternative, not very much more costly than the backhaul rates which have fostered rapid expansion of the Kenya-London vegetable and fruit trade, and well below the costs of transport at ordinary air freight rates, which at the beginning of 1973 were about 18¢ per ton km from the Nairobi Region to Europe. It would appear therefore that the H2, or eventually a more advanced airship, may be important in breaking the backhaul bottleneck that now impedes further horticulture development in Kenya.

However, the H2 faces some problems not encountered by backhaul traffic. First, the bulking requirements (100 tons) would be much more demanding at the point of origin. Second, the low speed would make the H2 less flexible in meeting the timing requirement at markets than is backhaul traffic. Finally, the airship is barely competitive with conventional airplanes on a cost basis for handling the traffic once volumes are large enough (say 15,000 tons per year) to justify a cargo plane devoted to this use. Costs, calculated on the same basis as those for the H2, ranged from 3.5¢ to 5.5¢ per ton-km for conventional aircraft in 1972. For comparable planes the cost increase has been about 60% since that time, mainly on account of fuel cost increases which have more than doubled. Costs for conventional aircraft would thus be in the 6 to 8 cent range per ton-km, at this point in 1974, roughly competitive with the H2. The

ground cost advantages of the H2 would probably be minimal in this situation because the infrastructure for planes is already highly developed.

Using Small Airships in the Region East of the High Andes in Peru

In the use of airships in the Andean region, the development program is considered in two basic steps: 1) the use of small airships, with useful load capacity of about 2 tons; 2) the use of a larger 15-ton capacity dirigible to replace the small airship in a particular area once the technical aspects of the use of an airship in the area have been proven, experience has been gained with its developmental impact, and crews have received adequate training. Because the crew will generally not have good ground support, they will need skill in maintenance and unassisted landings, as well as for operating in difficult terrain. From the economic point of view, only the larger dirigible will be competitive, as shown below. But to gain experience with maximum safety, the smaller high-powered, easily handled ship will be used. The cost characteristics of both airships were presented in Table I. The general zone that we are considering for use of these airships is east of the Andes mountains in Peru. The region reaches from the mountain side, called "ceja de montana" in Peru, to the Amazon valley. A zone with similar geographic characteristics reaches into Ecuador and Colombia to the north and into Bolivia in the south. The altitude varies from 1,500 m in the mountains to 700 m in the east and goes on into uncharted country, forests, and eventually into tropical jungles through which run the head waters of the Amazon. The valleys are sparsely populated, and the potentially productive area is, for the most part, undeveloped. These areas could potentially support a much larger population if better transportation and communications are supplied and if agriculture production is improved. Peru is now a large importer of foods, over \$230 million per year, in spite of having large unutilized areas for agriculture.

In these regions, roads are costly to construct and hard to maintain, and may be impassable in many periods of the year. Vehicles deteriorate rapidly and have high maintenance requirements. The high freight rates reflect the condition and type of road, the topography, and the irregularity of loads, vehicle circulation, and backhauls. Transport presents a particular problem in the flow of agricultural products because the arable land is largely found in relatively small valleys separated by rough gorges and ravines. A valley can therefore remain isolated economically, even when it is quite near a road "as the crow flies." The construction of access or penetration roads is extremely costly in the regions under consideration--above \$250,000 per km. Although distances are relatively short, the linking of all of the main valleys with penetration

roads is therefore not justified until and unless a high level of development is reached.

Air transport with conventional aircraft would require a large number of airstrips to provide adequate access, and it is doubtful that they could be constructed at a reasonable cost. Transportation with the prevalent airborne modes has higher direct operating costs as well: for example, the De Havilland twin otter--\$0.56 per ton-km, the Helicopter Sikorski--\$1.49 per ton-km, as compared to the 15-ton airship--\$0.30 per ton-km. Consequently, the VTOL (Vertical Take-Off and Landing) air transport mode is envisioned to fulfill the communication needs.

The transportation needs are for moving small cargos for short distances to road, rail or river heads. The aspects favoring the dirigible, in addition to its relatively reasonable cost of operation, are its flexibility and very low infrastructure cost. It does not require landing strips. An open field a little over twice the length of the vehicle in diameter, with a simple mooring tower placed in its middle around which the airship can weather-vane, will suffice. Thus in regions like those described, the airship could provide the link between the many isolated small communities and the few roads which provide general access to the region.

We may take a specific application for cost calculation: Transportation in the zone linked by the road Huanuco-Tingo Maria-Aguaytia in eastern Peru. Presently the road is semi-completed. It is not paved, and 30 km. remain as a five-meter wide earth path. From Huanuco westward, however, the road links up to the coast highway. We may consider the airships as alternatives to road development east of Huanuco.

The cost of completing the construction and the improvement of the 219 km road from Huanuco to Aguaytia was estimated at \$57,597,000, or \$263,000 per km. Depreciation over twenty years with a low estimated maintenance cost of \$650 per km per year results in a total yearly cost of \$31,526 per km for this road. (Costs that have already been incurred for the original road are not included in this estimate.) In 1972, traffic over the 219 km road from Huanuco to Aguaytia varied from 350 vehicles per day between Huanuco and Tingo Maria to 200-250 vehicles per day beyond Tingo Maria. At 300 vehicles per day the annual cost of the road would be \$0.282 per vehicle km or \$.115 per ton-km at the average load of 2.5 tons. The operating cost of the medium trucks that ply this road has been estimated (in 1973) as \$.25 per ton-km.

While the 2-ton airship at \$1.00 per ton-km is not competitive on a commercial basis, the 15-ton airship at \$0.296 per ton-km is highly competitive. In addition, it has inherent advantages over

TABLE III

SUMMARY OF ROAD TRANSPORTATION COSTS HUANUCO-AGUAYTIA

| | |
|--|--------------|
| 1. Road 219 km | |
| 1. Capital Investment | \$57,597,000 |
| 2. Annual Capital Charge plus maintenance per km | 31,506 |
| 3. Annual Capital Charge per ton/km \$/ton-km | .115 |
| 4. Total operating cost for truck \$/ton-km | .255 |
| 5. Total cost road transport \$/ton-km | .370 |

roads. It can stimulate agricultural development in a much broader zone, in regions far from this principal road where the developing stage would not justify the constructions of costly feeder roads for new agricultural development programs. The investment in an airship is minor, and its use is flexible, making it less risky than a high, fixed road investment. The airship can aid the development of potentially rich agricultural zones, such as those considered, almost immediately; it would be necessary to wait a long time before a road network is completed.

We conclude that in this case the airships are competitive with the construction and periodic reconstruction of the main road servicing the area. In addition, the airship can connect regions that are not effectively serviced by the road. Compared to feeder roads, which would also have very high costs but much lower traffic volumes, the airship is far less costly.

We may consider next the question of transportation to an isolated region in the Peru Via area to the southeast of Aguaytia. Except for a few scattered landing strips for light planes, and small fringe areas where dirt roads penetrate, this region is almost inaccessible. It has been amply demonstrated, through unsuccessful colonization experience east of the Andes, that without adequate transportation there is economic stagnation, a lack of progress, and large-scale farm abandonment. Colonization without proper transportation facilities would result in a waste of national resources. Several zones in this area are under active consideration in the country's development plans for the settlement of 37,000 families in the Apurimac-Ene valleys and 20,000 in the Palcaza-Pichi region. The regions are apt for cattle, agricultural, and forest production. More generally, within the radius of 150 km from Atalaya lie regions with an extremely rich potential. It can be expected that the presently existing population will multiply its output once a market for their products is established, and new production technologies can be introduced.

Atalaya is at a projected road distance of 365 km from the west-east road head near San Ramon which provides communication to the coast. A connecting road implies 316 km of mountain road (average construction cost \$/km 250,000) and 49 km of level road (\$/km 150,000). To provide adequate communication, several hundred kilometers of additional feeder roads (estimated construction cost \$/km 30,000) would also be required. The total construction, maintenance, and operating cost of \$0.52 per ton-km (see Table IV) is less than the direct transportation cost of a 2-ton dirigible (\$/ton-km 1.00), but considerably more than on a 15-ton airship (\$/ton-km 0.296) as estimated under present conditions.

TABLE IV
SUMMARY OF ROAD TRANSPORTATION COSTS SAN RAMON-ATALAYA

| | |
|--|--------------|
| I. Roads 365 km | |
| 1. Capital Investment | \$86,350,000 |
| 2. Annual Capital Charge plus maintenance \$ per ton | 28,350 |
| 3. Annual Capital and Maintenance Charge \$ per ton-km | .20 |
| 4. Truck operation cost \$/ton-km | .32 |
| 5. Total cost per \$/ton-km | .52 |

The present situation is that the produce of this zone does not leave the region due to lack of transport facility, and production remains limited as there are no accessible markets. Thus we are faced with questions such as: (a) To develop or not to develop the zone. (b) To start the agricultural projects practically immediately, or several years hence when the surface communication network can become operational. (c) To risk heavy investment capital to develop surface transport access before the development of the region is proven, or to postpone the projects until the production of the zone is flourishing. We would argue that in this case, where the road infrastructure is not yet in place and the economic risk of such road investments is very large, that the investment in airships is far and away the most conservative approach to linking this isolated area to the market.

[Extracted from a paper presented at a Lighter-Than-Air Transport Meeting, Monterey, California, July 1974. Proceedings published by the U.S. National Aeronautics and Space Administration.]

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