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Report of a Seminar

Women and Agricultural Technology: Relevance for Research

Volume 2 – Experiences in International
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Women and Agricultural Technology: Relevance for Research

Volume 2 - Experiences in International and National Research

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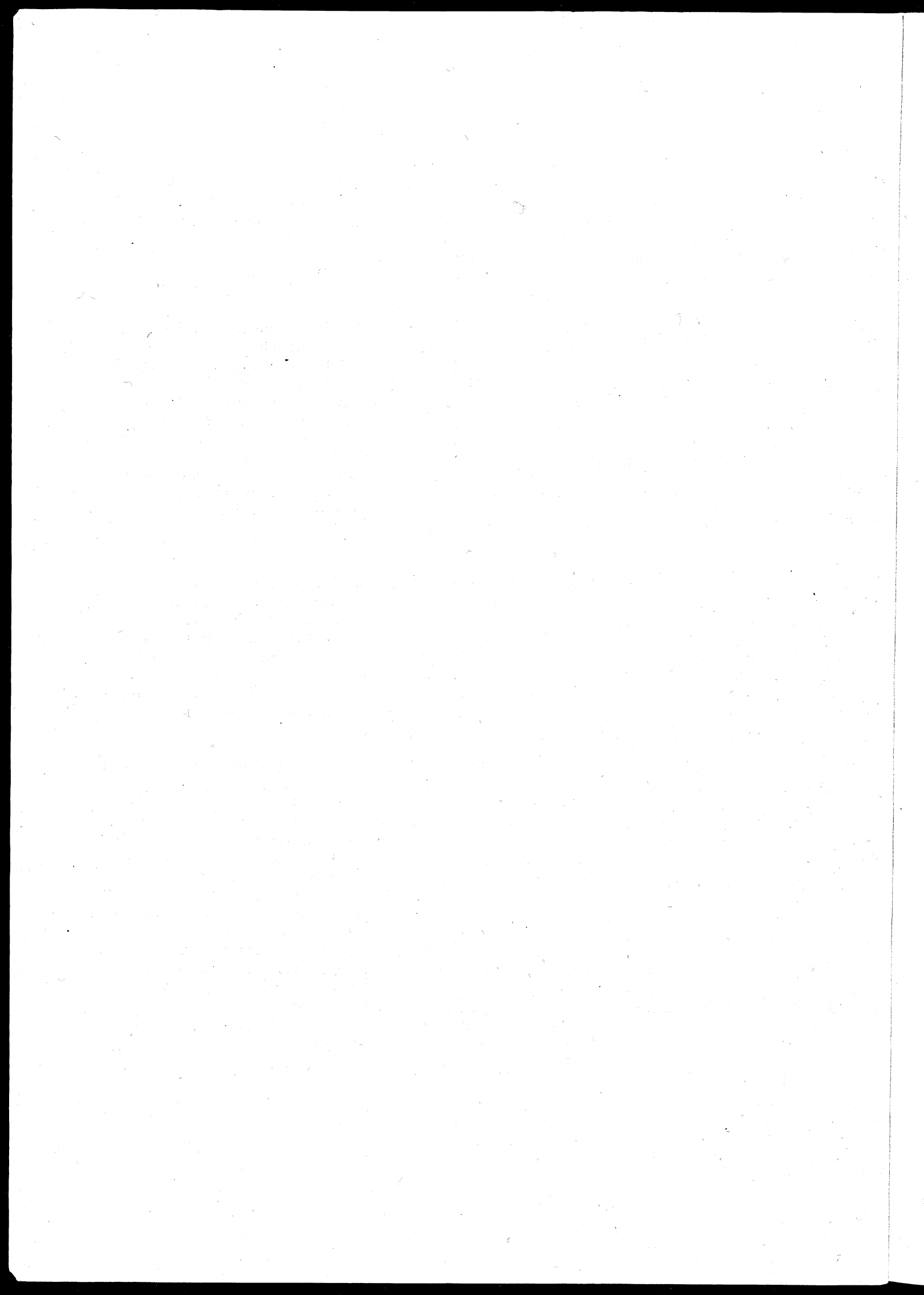
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Identifying Special User Categories for
New Agricultural Technology:
the CIAT Experience

by

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1. INTRODUCTION:

This paper is an overview of recent experience at the International Centre for Tropical Agriculture (CIAT) in identifying potential users of agricultural technology developed by CIAT research programs. The purpose of this paper is to provide background material for a subsequent synthesis of experiences with special user categories, in particular women, of all the international agricultural research centers in the CGIAR system.

The paper begins by setting the context for a discussion of CIAT experience in this regard with a brief description of the center's objectives and research program organization, followed by a short review of some important categories of women in the CIAT target region. The next section of the paper illustrates recent CIAT experience with women among user categories, emphasizing how these examples flow out of the overall process of identification of future users of new technology by the various CIAT programs. The concluding section reviews some commonalities in the approaches used by CIAT programs to implement this type of research, and some implications for research organization both within the center and in terms of relations with national programs.

1.1. CIAT's Objectives and Research Program Organization

CIAT's objectives identify a dual focus on poor producers and poor consumers in terms of special groups who may benefit from research leading to increased production, productivity and quality of food commodities included under CIAT's mandate for the American tropics. This dual focus is particularly important with respect to the relevance of women as potential users of CIAT technology because, as is discussed in detail later in this paper, a critical distinction exists among the needs of women in producer roles and their needs in consumer roles, particularly in Latin American societies.

CIAT's strategy emphasizes both increasing resource productivity on small farms, and/or expansion of agricultural production on the less fertile frontier lands to achieve more efficient use of land resources and to meet consumer demands. To address this strategy, the center is organized into four principal multidisciplinary commodity programs with responsibilities for beans (Phaseolus vulgaris) and related species; cassava (Manihot esculenta); tropical pastures (specially for the acid infertile soils of the American tropics). Each commodity is an important component in the food-budget of low-income consumers in target regions of emphasis. Improvements in the supply of rice and beef tend to be associated principally with benefits to poor urban consumers, while the Bean and Cassava programs are also associated with strategy for increasing productivity on small farms which are the major cultivators of these two commodities. Each commodity program is concerned with a variety of production systems in Latin America; moreover the Bean Program has recently developed new responsibilities in East Africa, and the Cassava Program is in the process of expansion to Southeast Asia. Research on pastures for tropical America is oriented at the development

of the less fertile lands and so concerns a great diversity of potential users, including large-scale cattle ranchers, and small-scale colonos or squatters on the perimeters of the agricultural frontier. Similarly, the rice program encompasses a broad range of potential user groups which range from small farmers without mechanization (in Brazil, for example) to large-scale, capital-intensive and highly mechanized rice producers (as in Colombia).

This brief overview of the mandate and organization of the center illustrates the complexity of the task of identifying target groups within the framework of a dual focus on poor producers and poor consumers which confronts the several commodity programs, and this has several implications for the process through which users' needs are incorporated into CIAT research activities. In order to discuss this process with respect to women, and different categories of women, it is necessary to look in summary form at some characteristics of women's roles in the CIAT target region.

1.2. Women in the CIAT Target Region

This overview of the characteristics of women as potential users of CIAT technology focuses primarily on Latin America, the center's principal mandate region, with some comparative references to other regions where new activities are being developed. Reflecting the very rapid rate of urbanization in Latin America, such that about two thirds of the population is classified as urban, most women in Latin America and most working women are urban dwellers. Upwards of 75 percent of all women reported as in the labor force in any given country for the mid-70s were active in the non-agricultural sector. These statistics reflect rates of rural-to-urban migration which tend to be higher for women than men in Latin America.

Labor force participation rates of Latin American rural women from census data are strikingly low in comparison to African and non-Muslim Asian Societies, but these figures conceal three important features of rural women's participation in agriculture. First, participation rates in field operations (planting, weeding, harvesting) differ substantially by social class. Women from landless or semi-landless rural households, estimated in 1978 as 15 million households ranging from 55 percent to 85 percent of rural households in ten Latin American countries (Lassen 1980), participate in agriculture as wage laborers, often in the large farm or plantation sector. Second, women's work in agriculture is culturally defined. When reported by male heads of household, the culture of machismo results in under-reporting of unpaid participation in family farm operations by farmers' wives and daughters. One case study found that 86 percent of women in small-farm households actually participated in agricultural work, although census estimates were much lower (Deere, 1977). A third feature of women's participation in agriculture is the sexual division of labor between commercial crop production, typically managed by men, and subsistence production for the household, almost always the responsibility of women - but seldom included in statistical accounting procedures.

In summary, the 53 million rural women in Latin America can be divided into four broad categories (Ashby, 1984). First, landless or

semi-landless laborers, whose participation in agriculture spans both the small-farm sector and seasonal or migratory labor in the plantation or large-farm sector. This appears to be numerically the smallest group of women working in agriculture according to census estimates. A second group is women who are from poor, small farms and who hire themselves out in addition to working on the family farm. Such households are classified as "sub-family" farms, and are a majority of farms in many countries in the region. Women family workers are numerically the largest category of women employed in agriculture. A substantial proportion are household heads, that is, primarily responsible for the economic support of their family. A third category of women are defined by census estimates as "self-employed" and constitute the second largest group of women economically active in agriculture in Latin America. This group includes women who in some Latin societies are traditionally responsible for marketing agricultural produce. A fourth category of women are members of more prosperous farm households, who often do not appear as economically active in census estimates, and who do not work as hired laborers, but who are responsible for domestic food production among a wide range of farm size and income classes. These farm women are in all probability a minority of rural women in Latin America, especially in countries with high proportions of sub-family farms (such as Colombia, Ecuador, Peru, Venezuela, Guatemala, Honduras, for example). Finally, it must be noted that the empirical basis for characterizing categories of rural women in Latin America is extremely weak. To some extent this gap in current research reflects the importance of urban society as the primary locale for women's labor force participation in Latin America.

Several factors related to the urbanization of Latin America -- the trend for women who live in cities to work outside the house; the fact that malnutrition is more an urban than a rural phenomenon; and that most of the poor in Latin America depend on purchased food -- have several implications for the structure of demand for the food commodities with which CIAT research programs are concerned, and this in turn affects how research priorities are set in relation to needs of user categories, in particular women. This is illustrated in the next section of the paper, with examples of research studies from the different commodity programs.

2. EXPERIENCE WITH IDENTIFICATION OF WOMEN AS USER CATEGORIES: SOME EXAMPLES

2.1. Production Systems

Systematic research which identified bean and cassava commodities with small farmers as future users of new technology, was initiated at CIAT in the early 1970s with farm-level survey research, since periodically updated with census and survey data (Díaz & Anderson, 1977; de Londoño et al. 1978; CIAT, 1982, 1983, 1984). This research contributed to defining research strategies in which screening for improved varieties in these commodity programs de-emphasized technology suited to prime land and mechanizable agriculture characteristic of the non-traditional, large-farm sector in Latin America. In the Bean Program, for example, several characteristics of small-farm bean production systems are built into breeding strategies such as screening for disease resistance and yield stability; selection of materials adapted to associated cropping

systems; selection of drought-tolerant plant types, all of which are features attractive to small farmers (Pachico, 1984; Sanders and Lynam, 1981).

Within the ongoing characterization of small-farm production systems in these CIAT programs, consideration of potential use by women of the technology has been undertaken on occasions when women are identified in the course of on-farm research as a relevant user group. For example, on-farm testing conducted in Colombia by the Cropping Systems and the Economics divisions of the Bean Program include trials of both new maize and new bean varieties in association. In one target farming system most field operations are carried out by men. But farm women play a role in determining desired characteristics of maize varieties, a dietary staple. Hence the evaluation of new maize varieties included in on-farm trials was conducted by interviewing farm women. In complete contrast, research characterizing bean production systems in East Africa shows that bean farmers are women. As a result, women's needs are being integrated into breeding strategies from the outset by CIAT outposted staff in Rwanda. For example, women select bean seed and grow beans in mixtures of varieties in order to maintain desired seed qualities. Testing of new bean materials includes, therefore, screening varieties which are compatible in mixtures. In another instance, the CIAT anthropologist found that Rwandan women did not desire quick-cooking varieties but were concerned about keeping quality of the beans after cooking; varietal evaluations will therefore incorporate this criterion. Other research characterizing bean production systems in Colombia has involved interviewing farm women about desirable characteristics of bean varieties destined for subsistence production vs. those destined for the market.

In order to benefit small farmers who are the principal producers of cassava in Latin America, the CIAT cassava program has developed a strategy of integrated production and marketing research. Since 1981-2 an important focus of this approach has been the Atlantic Coast project in Colombia where the development of new post-harvest technology created opportunity for the expansion of cassava production. In order to understand the role of cassava production in the existing farming system, research had to consider the decision-making strategies of women as "managers" of the household food supply, specifically in terms of the role of cassava in household consumption and production. A survey of 200 farms interviewing the men on land use, and the women on household subsistence production and consumption was developed as it became apparent that women's needs and preferences in terms of feeding the family could be deciding factors in achieving the main objective of expanding cassava production. For example, research on the cassava production system showed that although women do not carry out field tasks, they have an important role in determining the balance of associated crops or intercrops in cassava fields. This occurs principally because the woman manages the flow of foodstuffs from commercial cassava plots into household consumption and the complementarities between produce from these plots and her subsistence plot. Research found that the management of cassava in relation to household food requirements would be a pivotal consideration for the design of more productive cassava cropping systems. New cropping systems are likely to have higher capital requirements, and here again women were identified as key actors in capital generation by the small farm via

their responsibilities for raising pigs and poultry or cheese-making, which involve directly or indirectly channelling cassava into feeding livestock on the farm.

2.2. Marketing and Consumer Studies

The importance of demand studies for commodity research strategies in Latin America has prompted both the Bean and Cassava programs to undertake studies of consumer preferences. These studies help to identify desired varietal characteristics which will define the most profitable varieties for small producers of these commodities and for which breeding strategies need to aim. With the growing importance of purchases (rather than home production) of CIAT commodities in the diet of the Latin American poor, a majority of whom have lost their subsistence production base, women's needs as consumers tend to operate powerfully on research strategies in contra-distinction to women's needs as producers of CIAT commodities.

In traditional small-farm systems, even when there is considerable commercialization of crop production, the producer and the consumer needs and preferences of women are integrated in the domestic economy. However, once urbanization and large-scale commercialization of agriculture differentiate the urban woman and the rural landless-laboring woman as consumers who purchase rather than produce food supplies, from the rural farm woman as producer-and-consumer of food commodities, then important trade-offs exist among the interest of these different groups for setting research priorities. This is illustrated in the general thrust of CIAT's Tropical Pastures Program strategy, and that of the Rice Program. Technical change leading to increased production and productivity is likely to confer -- or has already done so in the case of rice -- important benefits on poor urban consumers (Scobie and Posada, 1977; Sere and Rivas, 1983). Although gender has not been an explicit category for characterizing needs of urban consumers for these commodities, implicit in a research strategy responsive to increased demand for rice and beef among urban consumers are the preferences for these easy-to-prepare foods of urban women who work outside the home. However, technical change which benefits poor women consumers may imply costs for women involved in production. In the case of rice in Colombia the evidence, although scanty, is that women agricultural laborers were displaced with the advent of new seed/fertilizer technology and mechanization of tasks which women laborers usually performed. Farm women from small upland rice farms were also shifted into a laboring status (both in agriculture and in urban employment) as the productive basis of the small upland rice enterprise in Colombia was displaced (de Correa, 1980; Hansen, 1983).

Consumer studies in the Bean and Cassava programs are concerned with analyzing quality characteristics of their respective commodities which affect consumer acceptability. Because the preferences of urban women consumers appear to be critical in price differentials among different sizes or colors of beans, for example, consumer studies to identify these preferences provide important information towards defining breeding strategies. In the Bean Program's consumer studies priority is given to characterizing minimally acceptable criteria for different varieties of beans among poor urban housewives. Desired bean characteristics change

as women lose their subsistence plots and become urban workers. For example, storage is more important for urban women than for rural women with subsistence plots. Survey research with urban women from different income classes showed that they will not purchase beans which have been stored for long, as beans become discolored and hard to cook. Therefore, screening of advanced lines in the bean program includes monitoring of this characteristic, in addition to other acceptability characteristics identified by women.

Survey research conducted in the Cassava Program also aims to identify the factors in women's decision-making which determine the relative attractiveness of different food commodities that are potential substitutes for cassava. Women managing household production and consumption, as well as women who are primarily consumers of purchased cassava were interviewed, as part of the integrated production and marketing studies referred to earlier. The results showed that urban women consumers emphasized cassava's perishability, and the inconvenience this entailed in shopping. This finding is translated into research program objectives which include improved storage technology and evaluation of stored cassava with panels of urban housewives for taste and cooking acceptability. Research on storage characteristics of cassava is also tapping into anthropological research on the indigenous technology of Amazonian Indian women for using cassava.

3. METHODOLOGICAL AND ORGANIZATIONAL APPROACH TO CHARACTERIZING USERS AMONG CIAT PROGRAMS

This section of the paper looks first at some commonalities in the approaches used by CIAT programs to implement research characterizing potential users of new technology, and then discusses some of the implications of this experience for the organization of research.

As the studies referred to earlier illustrate, research identifying women as relevant categories of users has evolved out of ongoing characterization studies of producers and consumers of CIAT commodities. Such studies are conducted by the economics research units, one of which is located within each of CIAT's four multidisciplinary commodity research programs. As an example of how such studies operate in the multidisciplinary team approach, the Tropical Pastures Program is beginning to screen materials for the humid tropics and the economics unit is concerned with characterizing farming systems where there is potential for CIAT pasture technology within this agro-ecological zone. Preliminary results indicate that such farming systems on the agricultural frontier will require an emphasis on small-farm milk and cheese production, with a probability that new technology may change the workload of women in these systems. Here then, a study of sex roles in production activities is likely to be required in future research.

Implementing such studies has typically required special research methodology from that normally used for ongoing economic characterization studies, largely because women have to be directly involved in the interviews and yet are seldom readily accessible to single-visit survey interviews. Field research has been required from sociologists and anthropologists to identify relevant sex-related factors which were then included in survey questionnaires. In order to carry out the survey

research on women, women interviewers have been hired and in some cases, it has been necessary to conduct two interviews in a household, with a member of each sex.

The research methodology for these characterization studies has therefore entailed a more intensive use of research resources in the sense that sociological field research and more interviewing within the survey framework has been introduced as sub-groups of users, such as women, have been investigated. As such studies have acquired increased importance in the economics units as a factor in clarifying objectives for breeding programs, there has been an expanded need for staff in these units who are trained for field research, and outposted for substantial periods from the center to field research sites.

In general however, this need has been met at little direct cost to the center because a major source of the additional staff required in the economics units have been one of the following: (1) associate staff, post-doctoral or postgraduate social scientists, economists and home economists who are often also trainees with support from another research institute, government, university or foundation; (2) collaboration with a national research and extension program which assigns some staff to the research. Hence such research, which includes studies characterizing needs of women, is carried out with a combination of core-funded research program resources, additional non-core sources which provide some of the field-oriented research staff, particularly in the social sciences, and the national program resources.

Information on "users perspectives" and the potential impact of new technology coming out of this characterization research feeds into different audiences, such as donors, policy makers and national research organizations, via the two main emphases of economic research. These are first, feedback to CIAT management and to researchers in other disciplines in each commodity research team; and second, development of methodology to be utilized by national programs. In the long run it is envisaged that national programs will take a major role in carrying out research characterizing potential users of CIAT technology while CIAT programs provide leadership or collaborate in studies important for developing new types of approaches. Current experience indicates that the involvement of national programs is an important step in transferring the methodology as well as the results of such studies to national program research units.

4. SUMMARY

CIAT's mandate and research strategy for the American tropics emphasize both increasing resource productivity of poor producers and/or expansion of production on the underutilized agricultural frontier, principally to meet needs of poor consumers. In the context of the rapid urbanization of Latin America and the trend for malnutrition to be concentrated among the poor who purchase their food, this strategy has required research to characterize both producers and consumers as potential users of CIAT technology. Within the framework of this ongoing research, studies specifically concerned with women are conducted when, for example, women appear to have significant managerial input into farming decisions about desirable production features of a commodity or when their preferences as consumers of a commodity are important.

This research is conducted principally by the economics units, one of which is located within each of CIAT's four multidisciplinary commodity research programs. Implementing studies concerned with women as potential users of CIAT technology has required more intensive use of research resources in the sense that there has been a need for sociological field research to identify and interpret relevant gender-related variables, in addition to survey research. An important objective of such studies characterizing potential users is to provide feedback to other members of the commodity research team about desirable features of technology, with the result that advanced lines in the breeding programs can be screened for these features. A second objective is to provide information to management towards refining overall strategy in terms of research needed to develop technology acceptable to different user groups. Research characterizing potential user groups also emphasizes improving the capacity of national programs to undertake and utilize the results of such studies, both by development of methodology and collaborative involvement of national program staff.

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