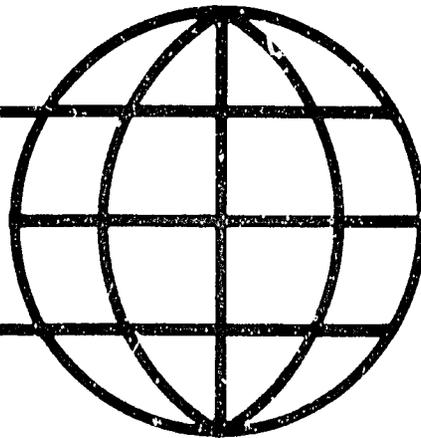


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**COOPERATIVE AGREEMENT ON HUMAN SETTLEMENTS
AND NATURAL RESOURCE SYSTEMS ANALYSIS**



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CONTRACT FARMING
IN IRRIGATED RICE PRODUCTION:
JAHALY PACHARR PROJECT, THE GAMBIA

by

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PREFACE

This Working Paper is part of a larger research project on Contract Farming in sub-Saharan Africa conducted by the Clark University/Institute for Development Anthropology Cooperative Agreement on Settlement and Resource Systems Analysis (SARSA) for the Africa Bureau of the US Agency for International Development (AID).

For purposes of this study, contract farming is defined by three fundamental characteristics: (i) a futures or forward market in which a buyer or processor commits in advance to purchase a crop acreage or volume; (ii) the linkage of product and factor markets insofar as purchase rests on specific grower practices or production routines and input and/or service provision by buyer-processors; and (iii) the differential allocation of production and marketing risk embodied in the contract itself. Contract farming includes, therefore, the large-scale nucleus-estate/outgrower schemes associated with, for example, palm oil in West Africa and sugar production in Kenya; the parastatal, export-oriented smallholder schemes associated with tea, tobacco, and coffee in Central and East Africa; and a multitude of private schemes producing fresh fruits and vegetables for canning, drying, and direct export to international markets.

Contract farming in a variety of institutional forms has been present in North America since the 1930s, but it has more recently become of increasing importance in Third World states, particularly throughout much of Africa. The objective of this study is to assess the form, organization, and impact of a diversity of contracting arrangements in sub-Saharan Africa, based on both secondary literature and field research in seven countries (Gambia, Nigeria, Ivory Coast, Ghana, Kenya, Malawi, and Senegal). The case studies have been carefully selected to represent the primary commodities and diversity of institutional forms of contract farming. A final report, based in part on the representative case studies, will indicate the conditions under which contract farming emerges; assess the distribution of costs and benefits to the principal actors, including growers; and evaluate the role of contract farming with respect to donor and host-government policies, technology transfer, and institutional development.

Michael Watts and Peter Little

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ACRONYMS

ADF	African Development Fund
AfDB	African Development Bank
CDC	Colonial Development Corporation
FAO	Food and Agriculture Organization
GCU	Gambia Cooperative Union
GPMB	Gambia Produce Marketing Board
JPQPR	Jahaly Pacharr Quarterly Progress Report
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
PMU	Planning and Monitoring Unit
PPMU	Public Planning and Monitoring Unit
OMVGG	Gambia River Basin Development Organization
USAID	U.S. Agency for International Development
WFP	World Food Program

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7.6 Dalasis = \$1.00 US

1 Dalasi = 0.14 US

PART I

GENESIS OF CONTRACT FARMING, FORM OF CONTRACT, ORGANIZATIONAL
STRUCTURE--JAHALY PACHARR SMALLHOLDERS IRRIGATED RICE PROJECT

INTRODUCTION

In 1984 the government of The Gambia implemented the Jahaly Pacharr irrigated rice project, which is based on contract farming. While Jahaly Pacharr is specifically designed to increase domestic rice surpluses and secure cereal import-substitution, its broader significance is as a prototype for future irrigation projects that will come into production with the development of the Gambia River Basin. Through irrigation The Gambia seeks to solve its agrarian crisis, which is characterized by dependence on one export crop, groundnuts, to finance milled rice imports. In the full development scenario, the production of cash crops year-round will enable The Gambia to diversify and expand its export crop sector.

The government's plans, however, require major adjustments in the farming system. Double cropping necessitates fundamental changes in household production dynamics, which evolved from adaptation to a short, five month growing season. Moreover, the state's objective to commoditize agricultural production will require a transformation of peasant farming strategies from a mixed cash/subsistence cropping pattern into simple commodity production for the market (cf. Bernstein, 1977;1979; Friedman 1979). At this stage in the Gambian agricultural trajectory, contract farming provides the instrument by which the state seeks to effect the necessary changes in the form and social relations of production.

The Jahaly Pacharr irrigated rice scheme is the first Gambian agricultural project successfully implemented with the new production form. Now in its fourth year of operation, the project has led to many changes in smallholder farming strategies. The purpose of this study is to identify the changes taking place in order to analyze the impact of contract farming on the organization and form of peasant production. In particular, this paper addresses four primary concerns: 1) Jahaly Pacharr's role in regional political and economic development; 2) its effect on inter- and intra-household resource access and allocation; 3) the project's impact on the social organization of labor in local agricultural production; and 4) the risk, growth, and equity consequences of project development.

This study is divided into three major parts. The first covers the genesis of contract farming in The Gambia, which provides a background to the form of the contract implemented in Jahaly Pacharr. Also discussed is the project's organizational structure, particularly the manner in which production, input distribution, and marketing take place. The first section concludes with an examination of the project's equity goals,

which were compromised in the original land distribution. Part II is an analysis of the three major agrarian impacts of contract farming in the Jahaly Pacharr project: 1) a skewed generational and gender bias to local resource control and access; 2) changes in household production dynamics that have conditioned labor availability and recruitment; and 3) the emergence of labor markets in the project area. These consequences are in turn linked to the evolution of new forms of peasant production in the project. Part III of the study is an examination of contract farming's impact on national, regional, and local economic growth. The project's role in generating backward and forward economic linkages to the irrigated rice sector is reviewed as well as potential risks to project farmers and the management. Summary remarks on the impact of contract farming on economic growth and rice import-substitution brings Part III to a close. Finally, this study of contract farming in food crop production raises several issues of theoretical interest to contract farming research, which are identified in the Conclusion.

This paper is the result of research conducted in the Jahaly Pacharr project area during its first year of operation, 1984, and follow-up fieldwork sponsored by the Contract Farming in Africa Project, Clark University/Institute for Development Anthropology Cooperative Agreement on Human Settlement and Resource Systems Analysis (SARSA) (funded by the Africa Bureau, AID).

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PART I:

GENESIS OF CONTRACT FARMING, FORM OF CONTRACT, ORGANIZATIONAL
STRUCTURE--JAHALY PACHARR SMALLHOLDERS IRRIGATED RICE PROJECT

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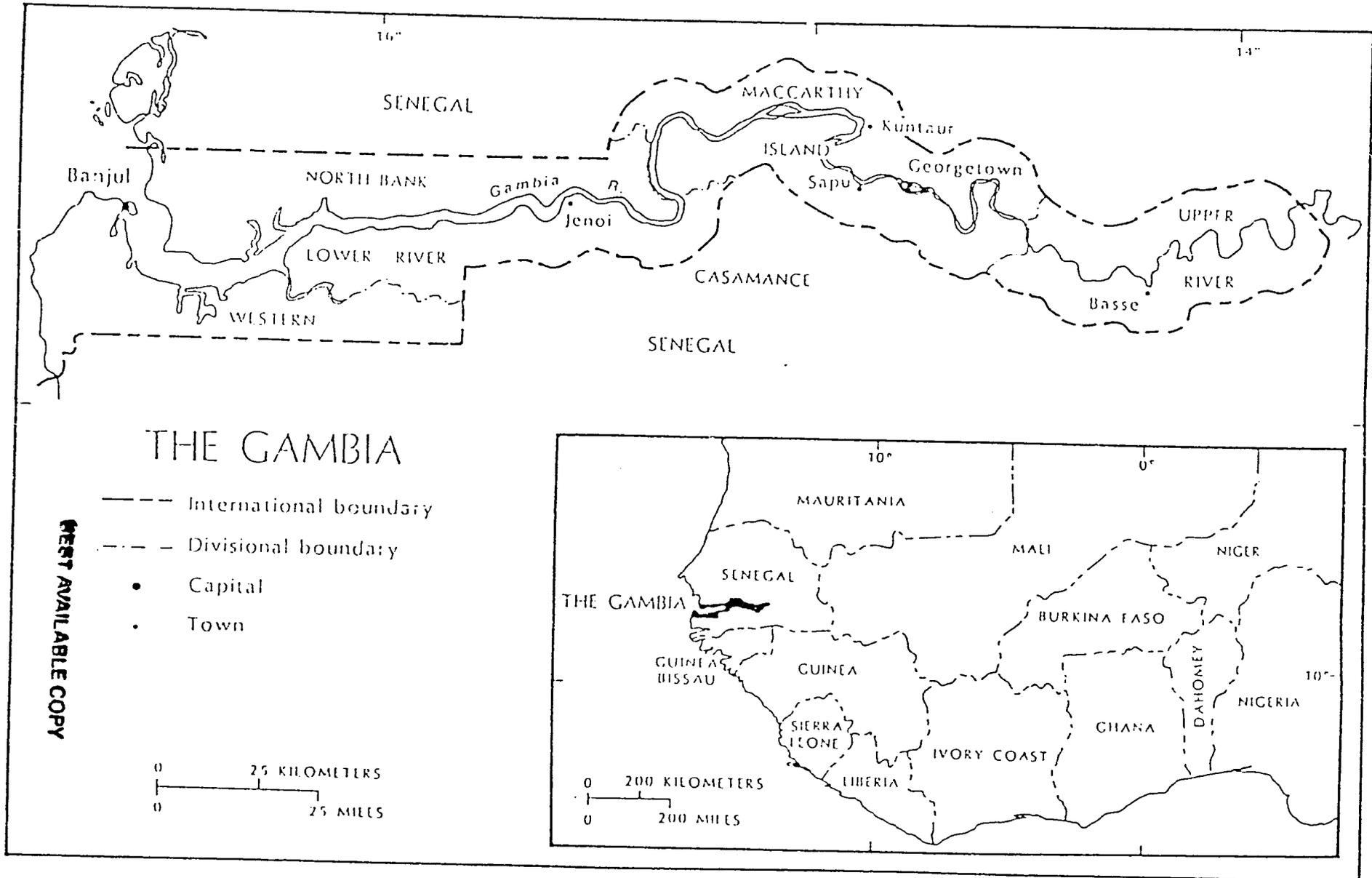
GENESIS OF THE JAHALY PACHARR PROJECT

The Jahaly Pacharr project, owned and operated by the Gambian government with Dutch technical assistance, is a result of the accumulated government experience in irrigated rice production during the span of several decades. Gambian irrigation projects have been organized under two primary development principles: small-scale, owner-operated perimeters and large-scale tenant farming projects.

Most of the production forms currently implemented in the Jahaly Pacharr project were first developed in the Colonial Development Corporation's (CDC) abortive Gambia Rice Farm, which operated from 1950 to 1958. The project leased 4000 acres in Jahaly swamp near Sapu (Map 1) for development of an agricultural scheme. Plans called for a highly mechanized operation to cultivate potential export crops by irrigation during the dry season, while supplemental irrigation would enable production of a wet-season rice crop. Of more consequence for production objectives was the CDC's plan to use wage labor for the nonmechanized operations, weeding and harvesting. But the failure to establish a reliable irrigation network limited the scope of the project to a wet-season operation and therefore rice cultivation, which necessitated changes in its labor arrangements. The CDC was to discover that during the rains it had to compete for labor when cultivators were already busy with their own crops. Moreover, labor availability was further limited by the fact that rice in The Gambia is traditionally grown by women. Soon after project inception these factors led to a revised strategy in which the CDC sublet rice areas to the dispossessed, original female cultivators. In return for land preparation, plowing, and harrowing, local women seeded, weeded and harvested the rice. From the harvest women were able to retain two out of every five bags of paddy. But this arrangement also was terminated amid accusations that women were under-reporting their rice yields (Carney 1986). In its place, the CDC established tenant or contract farming, where in exchange for land preparation and inputs, women agreed to repay the project a fixed amount of paddy. The strategy had three distinct advantages over the preceding arrangements: i) management was guaranteed a fixed amount of rice production; ii) agricultural risks were assumed by the cultivator; and iii) the benefits of project participation were directly linked to an intensification of each woman's labor. The contract farming arrangement was terminated when the project became unprofitable. As a result, the lease was suspended and the rice land returned to the original female tillers.

Though the colonial government failed to establish an irrigation project, the idea gained momentum with independence in

Map 1 The Gambia, Administrative Divisions



1965, when government officials began an active search for bilateral funds to develop reliable irrigation systems. Between 1966 and 1980 it succeeded in securing Taiwanese, World Bank, and mainland Chinese funding for a succession of three irrigation projects that developed nearly 2400 hectares. The projects were premised on quite different assumptions from the CDC scheme. They aimed to achieve production goals by substituting a large-scale, highly-mechanized operation for small-scale perimeters, which primarily relied on hand labor. The specific goal of the projects was to develop a second cash crop by commoditizing the food crop, rice. Rice import-substitution goals were, however, linked to double-cropping.

The small-scale perimeters phase of Gambian irrigation development had several consequences of direct bearing to the Jahaly Pacharr project. First, they were premised on the availability and intensification of family labor.⁽¹⁾ Second, the projects were implemented without attention to the gender-base of traditional rice cultivation. The farming principles were introduced only to men. Nor were they developed with an understanding of the dynamics of land use and labor obligations in the traditional farming system. Consequently, women were disenfranchised from their traditional rice lands and marginalized from rural development opportunities, a process that had a negative impact on their economic independence and well-being (Dey 1980). Moreover, male household heads often claimed the perimeters as their individual plots, which affected labor availability in two ways. First, when a plot is designated as an individual field, a Gambian farmer does not have access to unremunerated family labor.² Second, the limited use of the perimeters resulted from male labor conflicts with the groundnut cash crop during the rainy season. As a result of these factors, the small-scale perimeters never achieved high cropping intensities and fewer than ten percent were double-cropped. In addition, unreliable deliveries of key inputs like diesel, fertilizers, and spare parts for the pumps contributed to perimeter abandonment. By 1983 only one-third of the land originally developed even remained in production. Thus, although the small-scale irrigation projects did undoubtedly contribute to improved subsistence security among participating households, their failure to generate significant marketable surpluses made them a failure from the perspective of government officials.

New hope for the irrigation sector developed in 1982 with the promise of multilateral funding for implementation of an irrigated rice project at the Jahaly and Pacharr swamps.⁽²⁾ The credit package enabled the Gambian government to pioneer a production-labor arrangement designed to overcome the problems of the earlier schemes and to guarantee two key objectives: i) double-cropping and ii) the supply of rice surpluses for the national market. The mechanism by which these objectives are to be realized is through contract farming.

THE NATURE OF THE CONTRACT FARMING AGREEMENT IN JAHALY PACHARR

The Jahaly Pacharr project is in many ways a return to the ideas first advanced in the CDC's Gambia Rice Farm. First, it operates on lease land. Although termed a smallholders' project, it is owned and operated by the Gambia government, which has secured a 21-year renewable lease with local cultivators through their representatives, the village headman, elders, and district chief. Second, Jahaly Pacharr is also a large-scale scheme, operated under a centralized management that organizes the cropping calendar and pump-irrigated water deliveries. Third, Jahaly Pacharr has been established with a contract-farming production arrangement.

But the Jahaly Pacharr project is likewise indebted to key principles advanced in the small-scale perimeters. Most of the farming operations are not mechanized but rely on hand labor. Further, the Jahaly Pacharr project is premised on the availability of family labor. The original land allocation was loosely based on available household labor units for irrigated farming. The project has established a fixed amount of paddy production for seasonal loan repayment, thereby making a household's surplus production for food needs and/or sale dependent on labor availability, particularly its capacity for intensification.

Jahaly Pacharr, however, departs from the ideas of previous projects in two fundamental ways. To ensure marketable surplus production, the project ties plot usufruct to: i) double-cropping; and ii) the full repayment of production loans immediately after harvest. Although a written contract does not bind producers to project guidelines, cultivation practices come under surveillance of the project management through its agricultural extension agents. The failure to crop or to repay the production loans to the government's buying and marketing cooperative for paddy can lead to eviction from the project. The threat of usufruct loss, then, is the key mechanism by which the project management seeks to exert a basic labor discipline among producers.

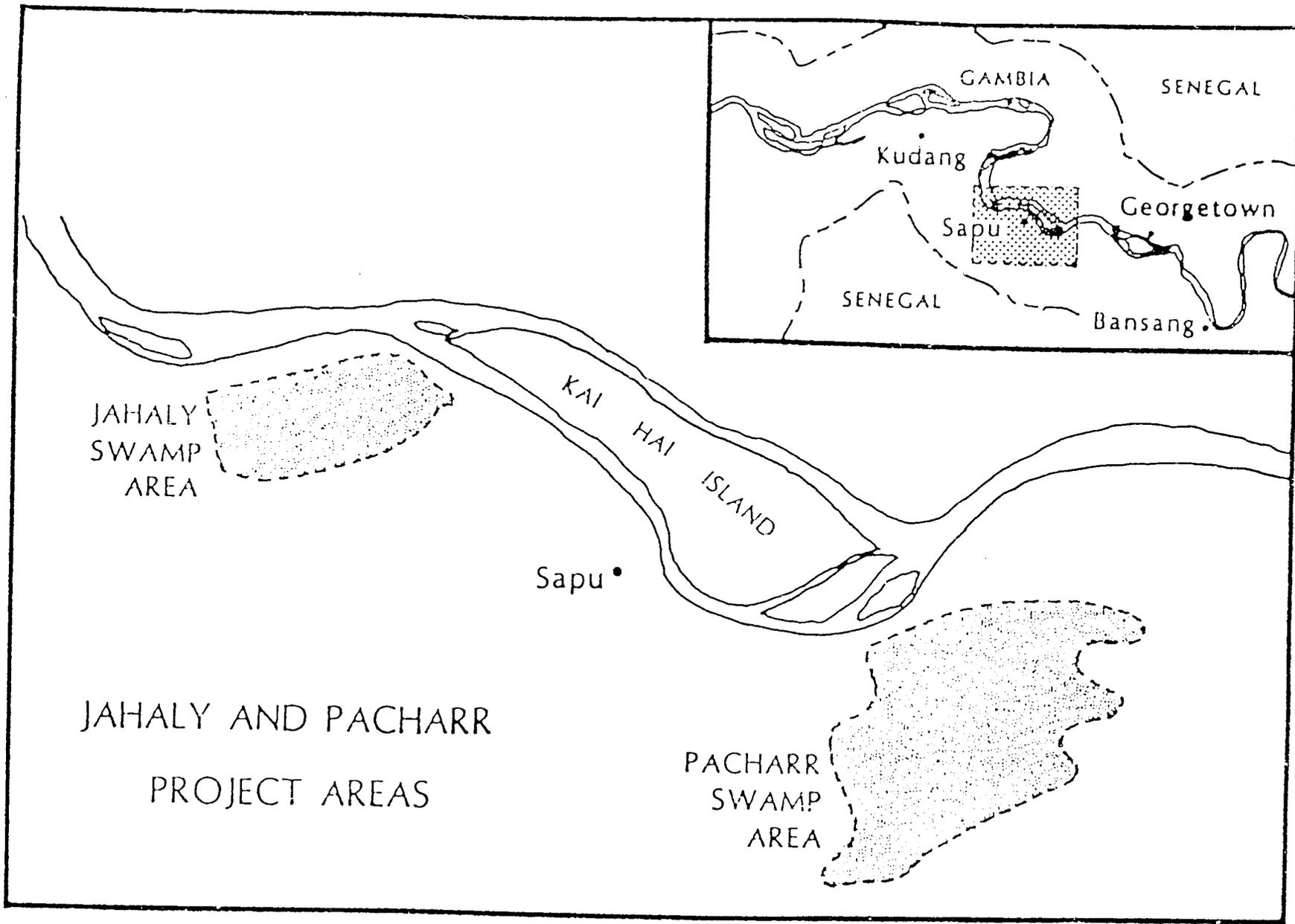
ORGANIZATIONAL STRUCTURE OF JAHALY PACHARR

The Jahaly Pacharr irrigated rice project is located near Sapu, 280 kilometers east of Banjul, The Gambia's capital (Map

1). Named after the two large swamps developed into irrigated perimeters (Map 2), the project encompasses a broad geographic sweep. When completed in mid-1987, Jahaly Pacharr will involve over 2,000 rural households from 70 villages and directly affect about one out of every eight Gambians.(3) Nearly 1500 hectares of rice land are developed in the project, of which 560 are pump-irrigated, more than 700 tidal-irrigated (one-third can be double-cropped), and 200 hectares targetted for improved rainfed cultivation. With the Jahaly Pacharr project the government of The Gambia hopes to generate 7000 tons of marketable paddy, which would reduce milled-rice imports into the country by 25 percent.

Farmers in the Jahaly Pacharr project utilize a Green Revolution biochemical production package, which relies on high-yielding, short-duration seed varieties, fertilizers, and pesticides. While the management provides mechanical land preparation, most of the farming operations are performed by manual labor utilizing rudimentary hand tools. Table 1 summarizes the division of farmer and management responsibilities for project cultivation activities.

For the purposes of water deliveries and extension, the rice perimeters are organized in ten-hectare blocks. Each block, in turn, is divided into two-hectare plots, which are subdivided into the fundamental field unit, a 0.5 hectare plot. The project management unit organizes and establishes the calendar for cropping activities for each year. In general, a cropping cycle spans 120 days with the dry season crop established in early January for a May harvest and rainy season planting begun in June for a November-December harvest. The cropping cycle for pump-irrigated plots is particularly critical since mechanical land preparation must take place in the interval between planting seasons. Delays in the cropping calendar carry two significant risks. First, the wet season harvest should be completed by December so that the crop is not threatened by the cooler December temperatures that sometimes drop to 15 degrees centigrade. Second, a delay in the dry season crop's harvest poses major problems in the farming system of local cultivators. A fundamental objective of the project is to develop rice as a cash crop in addition to continued cash cropping on the uplands. The failure to harvest the irrigated rice crop by early June poses serious labor bottlenecks with establishing the groundnut crop at the beginning of the rains. Figure 1 presents the ideal pump-irrigation cultivation schedule for a typical year. Besides setting up the annual cropping calendar, the project management unit, through five major departments, centralizes all extension,



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Scale: Distance between two swamps = 7 kilometers

TABLE 1

Responsibility in Pump-Irrigated Plots, Jahaly Pacharr Project

MANAGEMENT

1. Water delivery.
2. Dry land preparation, field plowing and land levelling.
3. Wet land preparation, "puddling" or pre-irrigation field saturation.
4. Maintenance of project infrastructure (irrigation canals, drains, pumps, roads).
5. Providing the technical and agronomic assistance to farmers to carry out irrigation farming operations.

FARMERS

1. Pre-irrigation field activities.
2. Nursery bed preparation.
3. Sowing nurseries.
4. Irrigating nurseries.
5. Manual plot levelling.
6. Transplanting.
7. Weeding.
8. Fertilizer applications.
9. Harvesting.
10. Threshing.
11. Delivery of paddy to project cooperatives.
12. Maintenance of irrigation canals and bunds.

COOPERATIVES

1. Provides timely supply of inputs: seeds, fertilizers, and paddy rice sacks.
2. Purchases paddy from farmers and arranges its storage and distribution to government rice mill.
3. Keeps records of farmer loan repayment for the project management.

Source: JPQPR 1986

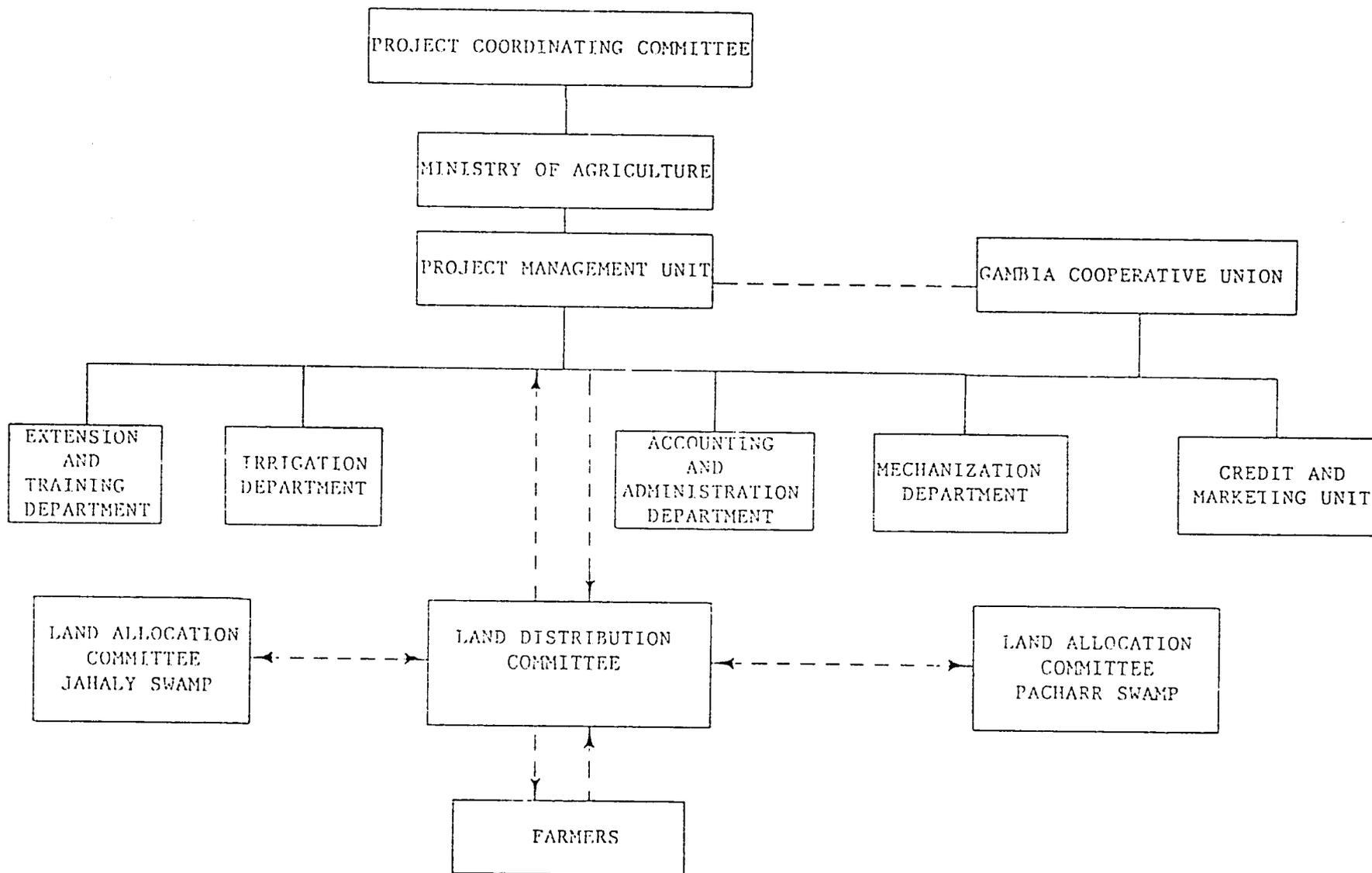
agronomic and credit decisions (see Figure 2). These are relayed to farmers through two major conduits: i) the land allocation committees; and ii) the contact farmers selected for each ten hectare irrigation block. Individual farmers do not represent themselves to the project management directly, but through the land allocation committees that they elected at project inception. All production inputs are organized through the Gambia Cooperative Union's two marketing and buying agencies. The cooperatives are also in charge of receiving producers' paddy, which is used for repayment of the seasonal credit. While the government of The Gambia sets the producer paddy price, the charge of the seasonal credit package is established by the project management in conjunction with higher-level government officials. The cost of the package is annually adjusted to changing producer paddy prices and inflation. During the first four years of the project, the seasonal credit for pump-irrigated land has been calculated at about one-third of the average, expected harvest (4.0 tons per hectare). Table 2 presents the credit charges on the project's plots for the 1986 wet season.

GROWTH AND EQUITY OBJECTIVES OF THE JAHALY PACHARR PROJECT

Jahaly Pacharr was conceived with several economic, political and social objectives. It was designed to expand irrigated rice production among farmers in a zone with a great deal of experience in tidal, pump, and rainfed rice production. The introduction of a biochemical production package combined with higher producer paddy prices promise yield increases as well as improved rural incomes.(4) In fact, a fundamental reason for farmers' initial acceptance of contract farming production strictures was the opportunity the project offered to become rice self-reliant.(5)

Although the Mandinka and Serrahuli are the region's primary rice cultivators, the government has aimed to broaden politically the project's economic impact by including villages representing all major local ethnic groups.(6) Because the disproportionate benefiting of village male elites had contributed to the failure of previous irrigation schemes, the Jahaly Pacharr project was established with two primary social objectives designed to broaden rural labor participation: 1) to extend the benefits of irrigation farming to the rural poor; and specifically, 2) to target women. These objectives were succinctly summarized in the project donors' appraisal report:

Figure 2. ORGANIZATIONAL STRUCTURE OF THE JAHALY PACHARR PROJECT



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TABLE 2

Jahaly Pacharr Project: Charges for Wet Season 1986 Credit Package

<u>Pump-Irrigated</u>	<u>Costs (dalasis)</u>
1. Water fees	225
2. Land preparation	186
3. Seeds (30 kg @ D 1.5/kg)	45
4. Fertilizers (2 bags compound + 2 bags urea)	<u>216</u>
	Total 672 (about 11 bags of paddy)
<u>Improved Rainfed</u>	
A. Tidal Irrigated	
1. Water fees	120
2. Land preparation	156
3. Seeds	45
4. Fertilizers	<u>165</u>
	Total 486
B. Rainfed	
1. Land preparation	156
2. Fertilizers	<u>108</u>
	Total 264

Source: PMU, Jahaly Pacharr Project, 1987.

"In assisting the Government [of The Gambia] to reach its goal of rice self-sufficiency and to improve the lot of the rural poor, the project makes special reference to women, who traditionally have been the major rice growers under arduous swamp conditions" (IFAD 1981).

Lease Land, Social Objectives, and Plot Distribution

This section examines the manner in which the project's equity objectives were compromised. The failure to carry forth the stated social goals was linked to the outcome of the local political alliances that were forged to deliver popular support for the Jahaly Pacharr project. As discussed above, the key to contract farming rested on tying land access to production goals. But the state needed to gain control over farmers' land, held in customary tenure. In the absence of a law that permits the nationalization of land for public interests, the ability of the state to impose contract farming depends on securing a lease from local farmers. The Gambian government mobilized popular support for the Jahaly Pacharr project by doing two things. First, farmers were promised World Food Program milled rice supplies to cover subsistence needs while the perimeters were under construction. Second, government officials recruited the support of traditional elites to legitimize the project to farmers. The strategy was successful and led to the negotiation of a 21 year lease. But the lease was made renewable, which means the government must sustain local support for the project. This is a political consideration that local elites have been able to manipulate to their advantage.

Their prominence socially and politically enabled traditional elites to dominate the land-distribution process. Plot awards sometimes reflected political clientelism more than the two fundamental criteria mandated by the donors for the land allocation: i) the inclusion in the project of the original rice-farming families; and ii) the award of pump-irrigated plots to women. The results of the land distribution can be summarized as follows:(7)

1. Most, but not all, original tillers were accommodated in the project.
2. Men, not women, gained control of pump-irrigated land.
3. In the plot distribution traditional rural elites--

village chiefs, elders and lineage heads-- benefited more than other villagers.

3. Within the farming household, the power and position of the male compound head was strengthened over dependent male and females.

The socioeconomic, generational, and gender bias of the land distribution reflected prevailing hierarchical relations in the traditional social structure. But the land distribution in Jahaly Pacharr actually strengthened the existing power structure. The matrix of political and economic interests that were key to implementing contract farming seriously compromised the project's equity objectives.

The first of these, improved opportunities for the rural poor, was partially achieved. Most original tillers' families were included in the plot distribution, but those representing the more resource-poor immigrant lineages seldom obtained access to more than one pump-irrigated plot, which was observed more frequently with founding settler lineages. In a survey of one typical project village, these status differences in resource control are brought into relief. Table 3 shows that founding settlers, 25 percent of village households in Wellingara, obtained three-fourths of the pump-irrigated plots in the land allocation. Although all village households did receive plot awards, none of the founding settler families had to share a plot while about 40 percent of immigrant lineage families did. Among such farmers, the plot cannot provide for more than subsistence needs once paddy for loan repayment is deducted.

In other villages, the land rights of immigrant lineages became secondary to the political objectives of influential committee members who used the plot distribution process to strengthen their local power base. This process was particularly observed in two more commercially-oriented villages of the area, (8) where new cultivators were brought into the project at the expense of accommodating original tillers. Most of these plots were awarded to local businessmen, traders and Department of Agriculture personnel, and little attention was given to availability of family labor.

The land distribution committees most notably failed to achieve the second social objective--the award of pump-irrigated plots to women. In the first land distribution, very few women's names were listed as plot "owners." While government officials made no effort to reverse the process, IFAD, the principal donor, did. Men's names were removed from plot ownership, and the land was registered in the names of female household members. While this action was praised widely as an instance of gender equity in rural development (New African 1985; International Agricultural Development 1985; African Business 1986), the redistribution

TABLE 3

Distribution of Pump-Irrigated Perimeters Between Founding
and Immigrant Settler Lineage Households: Wellingara

<u>Classification</u>	<u>Number of Households</u>	<u>Hectares</u>	<u>Percentage Control</u>
Founding settlers	8	5.8	25
Immigrant settlers	32	17.2	75

Source: Fieldwork data 1984.

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proved to be cosmetic, changing only the name on the plot--not actual resource control (Carney 1986).

In sum, the Jahaly Pacharr land distribution failed to reverse male control of irrigation schemes in The Gambia and acted to strengthen the existing gerontocratic and gender basis of local resource control. This resulted from the outcome of political alliances that enabled the state to negotiate a lease with local farmers, upon which contract farming depended. While the outcome of the process generated conflicts between households over the skewed land distribution, the key arena of struggle developed within households over women's access to rice land. The next section discusses the way in which labor needs for contract farming posed a structural obstacle to the donors' goals to award women irrigated land. This serves as a framework for examining the labor- and land-use patterns that have evolved in the project during the last four years.

Crop Rights, Labor Obligations, and Irrigated Land

Three factors operated to make it unlikely that the irrigated plots would have come under female control. The first was the insecurity of tenure in the project, specifically the fact that failure to meet the contract farming production goals could abrogate the tiller's cultivation rights. Second, plot allocation was loosely based on household labor reserves, which implied the need for more than one woman's labor to sustain cultivation, thereby necessitating some arrangement to draw on other family members' labor. Third, conflicts over women's rights to land had accompanied previous rice development projects in The Gambia and failed to establish a precedent for women's individual ownership rights to developed land.(9)

Men resisted plot awards to women, claiming initially that in the case of divorce, the land would be alienated from the household. Since residence in The Gambia is virilocal and divorce common, when marriages dissolved plots in the project would circulate out of a household's control. The project management mollified their concerns by deciding that a divorced woman would retain plot control only if she remained in the community. If the woman remarried outside the village, the plot would be reallocated to another female member of her ex-husband's household (JPQPR 1984). While the clarification upheld women's usufructuary rights to land, it also opened up the interpretation that the household had ultimate control over project plots.

Another important factor encouraging household, rather than an individual's, plot control was linked to the labor needed to

carry out double-cropping on pump-irrigated plots. Preproject calculations estimated more than 358 adult days to perform the irrigated cropping operations--more than one individual's labor (EUROCONSULT 1980). The Jahaly Pacharr project was predicated on the availability of family labor for irrigation farming, particularly its capacity for "self-exploitation." Thus, a plot could not be cultivated solely by one female. Nor did customary labor obligations give women access to supplemental family labor.

The Gambian farming system operates simultaneously with many forms of tenure, which carry specific crop rights and labor obligations. On the most general level, land may be owned either by a household or by an individual. While the cases of actual individual ownership are less frequent, they are important because the owner may alienate the land as s/he desires. In the majority of cases, however, land belongs to the extended family and cannot be removed from the kin-residence group. Within the classification of household land, there is an important secondary distinction. Dependent males and females have the right to usufruct of individual plot(s), over which they control the crop's disposal rights. This they are given in exchange for providing labor on household fields, which are used to produce food crops. When a field is designated household land, the organization of labor, crop storage, and disposal comes under the male compound head. He is also the only household member who has the right to family labor on his individual fields. The goal to ensure family labor for double-cropping, as well as the fundamental structure of the farming system, thus conflicted with the social goal to award women pump-irrigated plots. From the first cropping season, the project's pump-irrigated perimeters were claimed as household land. But the change in intra-household labor relationships engendered a number of conflicts that were to have important ancillary repercussions.

PART II

CONTRACT FARMING AND HOUSEHOLD PRODUCTION DYNAMICS

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IMPACT OF CONTRACT FARMING ON HOUSEHOLD PRODUCTION DYNAMICS

The Jahaly Pacharr project provides an illuminating example of the impact of introduced technological processes on a particular farming system with specific land use and labor rights. It also demonstrates the consequences of contract farming on household production dynamics. In Jahaly Pacharr the need to secure labor for double-cropping and the labor-intensive cultivation regime triggered a major evolution in traditional rights of access to land and labor within farming households.

This section identifies the primary changes that occurred.

Variations in Land Use of Jahaly Pacharr Plots

The designation of pump-irrigated plots as household land enabled the household head to make claim to family labor. Intra-household conflicts emerged, however, over labor obligations for two cropping seasons. As we have noted, the social structure of crop rights and labor use in the Gambian farming system had evolved for a single cropping season, but the project's double-cropping requirement caused household heads to demand the customary obligations for two cropping periods. Conflicts were less marked during the first dry season crop but mounted in the 1984 rainy season when upland groundnut fields were planted. Male dependents diverted labor to their individual groundnut fields, but female rice growers, who had lost their private plots with project development and did not have upland fields, shouldered most of the work burden on the pumped plots. This change in the social organization of family labor had several repercussions, which reflected ethnic and intra-household variations in conflict resolution.

The dominant ethnic group in The Gambia as well as the project area is the Mandinka, among whom the primary food crop, rice, is traditionally cultivated by women. Mandinka women grew rice both as a subsistence and cash crop. Unlike the other major ethnic groups in the project area, Mandinka women seldom had upland groundnut fields. Consequently, project development brought a loss of their individual crop land as well as their income-earning possibilities. Once the pump-irrigated plots came under control of the household, women immediately focused on demanding some form of compensation for their labor.

Their first objective was to gain control over the tidal-irrigated plots, which were being developed for rainy season cultivation. Unable to get the project management to make a decision in their favor, women organized on the village level for their interests. This did have some positive results. When a household obtained plots in both pump and tidal areas, the women usually were able to get usufruct to the tidal-irrigated land. But if a Mandinka household had to share a pump-irrigated plot, the tidal area also usually remained household land. Thus, the more resource-poor Mandinka households have generally not been able to accommodate female demands for rice land. In these areas the impact of the project on women's economic independence has been markedly negative.

Patterns in Serrahuli villages offer some interesting variations from those observable among the Mandinka. Serrahuli women also cultivated rice in the preproject period. A major difference between them and the Mandinka, however, is that Serrahuli women usually only relied on rice for food-crop needs. Groundnuts were cultivated for cash purposes. Thus, women's more diversified economic base, particularly usufructuary rights to upland cropping areas, strengthened their bargaining position in the household. This prevented household heads from depending primarily on unremunerated female labor in the pump-irrigated plots. As a consequence, Serrahuli women usually receive harvest gifts for their labor, and the tidal plots are often considered women's individual fields.

The Fula and Wolof villages, which seldom cultivated rice in the preproject era, also are characterized by a more diversified economic base for women, who grew groundnuts as a cash crop in the preproject era. As with the Serrahuli, the fact that women as well as men have individual groundnut fields improved the bargaining position for the women of these ethnic groups in household labor obligations. This in turn has resulted in a more balanced gender structure to the labor in rice cultivation. Among the Fula and Wolof, rice cultivation has become appended to their overall farming system. Since rice cropping is generally a new agricultural crop and these villegas have not received a great deal of irrigated land, both pump and tidal plots are generally considered household land, primarily used for subsistence, and the labor is shared between men and women.

A rough estimate of control over the tidal plots among all ethnic groups suggests that about 50 percent are considered women's individual fields, but the women have secured only usufruct, not ownership, rights to such plots, and the plots are often shared, which means that even if good yields are obtained they may be divided between several women. Moreover, women's tenure security rests on marriage. If she divorces her husband, she loses plot usufruct.(10)

Plot Designation and Control of the Investible Surplus

Struggles over land use were but one consequence of the impact of the Jahaly Pacharr project on household-production dynamics. Another was struggle over control of the investible surplus. Although the pump-irrigated plots were designated household land in order to secure family labor for cropping, the new biochemical rice production package had important secondary implications. Rice was no longer simply a subsistence crop. Instead, surpluses were being generated. In the past the term "household fields" implied food crop land, and the produce was not sold. The Jahaly Pacharr project, however, is premised on generating surpluses, while contract farming specifically necessitates that part of the harvest be sold. When household heads invoked the term "household fields" to secure family labor on the pump-irrigated plots, internal struggles developed over the distribution of the plot's surplus. This became a second arena of conflict between men and women in the project.

A major impact of the Jahaly Pacharr project has been to dramatically increase the power and income possibilities of the male household head. While the designation of the pump-irrigated plot as a household field made family labor available for cultivation, the manipulation of resource categories has had differential benefits to household members. First, it has centralized crop rights and labor under control of the household head, usually the senior male. Throughout the project area, the male household head stores, distributes and sells the paddy. Second, it is he who controls the decisions on the use of the investible surplus. Third, though designated a household field to secure dependents' labor, the plot is actually functioning as the individual field of the household head. Thus, project development has enabled senior males to increase their income-earning possibilities at the expense of other household members. The meaning of this for household resource control and accumulation is not insignificant. The price the Gambian government is offering for paddy has climbed steadily during the last decade (Table 4) and rice is becoming an attractive second cash crop in The Gambia. Yields on the project's pump-irrigated plots have averaged over 5.6 tons per hectare, while the sale of paddy to repay the seasonal credit has been fixed at about 1.2 tons. Given the low preproject per capita income (US \$130) and the value of a ton of paddy (945 dalasis or US \$124), the surplus represents a significant increase in local incomes.

Control of pumped-land by senior males in Jahaly Pacharr demonstrates several points of potential bearing on future contract farming schemes in The Gambia. First, given the social structure of the Gambian farming system, projects like Jahaly Pacharr do not necessarily lead to a distribution of economic benefits within the household (Carney 1986). In fact, the scheme

TABLE 4

Producer Price for Paddy Rice 1972/73-1986

<u>Year</u>	<u>Dalasis per metric ton</u>
1972/73	153
1973/74	242
1974/75	309
1975/76	353
1976/77	397
1977/78	441
1978/79	463
1979/80	492
1980/81	492
1981/82	510
1982/83	510
1983/84	560
1984/85	560
1985/86	600-800
1986/87*	945

* Since 1984 the price has remained constant.
Differences are due to devaluation.

Source: GPMB Annual Accounts, Banjul, USAID

is strengthening the economic position of the household head over other family members. Second, contract farming can trigger important changes in resource use and crop rights within the household, which suggests that certain family members may have an interest in limiting others' access to resources. Third, the reinterpretation of customary land-use categories to achieve control over labor is setting forth many intra-household conflicts, among generations and between men and women. These consequences may seriously limit the capacity of Gambian contract farming schemes to effect an intensification of household labor. As we shall see in the next section, variations among households in conflict resolution have conditioned the availability of family labor. Finally, the control of the investible surplus by one sector of the household, senior males, makes its use all the more critical to the project's productivity goals and local agricultural growth--particularly whether it is used to promote productive or unproductive accumulation (Berry 1984).

Some preliminary information on patterns of use of the investible surplus was gathered in Wellingara in January 1986. One-third of the interviewed village households were asked to present an investment portfolio of surplus paddy sales. Table 5 presents the results. Household heads spent their incomes on six main categories. Less than half those surveyed invested in the project's production loan package, which enables producers to purchase donkey carts and agricultural implements on credit. More invested in female labor, demonstrated by widespread recognition of an increase in polygamy since project inception and, specifically, in the number of new wives taken by senior males. Consumer items such as bicycles, radios, and cassette players also figured as major household purchases. Although these figures cannot be extrapolated to provide a general characterization of project households, they do indicate some important local trends and future research directions. If the centralization of control of the investible surplus is used to promote unproductive patterns of consumption that are designed to defend prevailing control over resources, the ability of projects like Jahaly Pacharr to transform agricultural production and deliver their productive potential may be seriously constrained.

Conflict Resolution and the Availability of Family Labor on Pump-Irrigated Plots

In addition to changes in resource control and use of the investible surplus, the third major impact of contract farming on household production dynamics is on the social organization of family labor. This section examines the manner in which the Jahaly Pacharr project affected the availability of household,

TABLE 5

Structure of Investment from Pump-Irrigated Perimeters: Wellingara¹

<u>Category</u>	<u>Number of Households</u>	<u>Total</u>
1. Small consumer durables (bicycles, radios, cassette players)	4	12
2. Animals or agricultural implements	4	12
3. Wives	6	12
4. Petty trade	3	12
5. Mecca	2	12
6. Home improvements	3	12

¹ Sample: 12 out of 40 households

Source: Fieldwork data 1986

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particularly female, labor for pump-irrigated cropping operations. In particular, the discussion focuses on the impact of internal conflict resolution on the capacity of the household economy to intensify its labor. Conflicts that developed within project households reflected both differences between ethnic groups as well as variation among families. The resolution of these conflicts conditioned differences in the availability of family labor between project households.

Since the inception of the Jahaly Pacharr project, officials have been closely monitoring the use of family labor, particularly the gender structure of key farming operations. Estimates of the amount of time required to perform certain agricultural tasks as well as the type of family labor to do so are available in Figure 3. With this data, project officials have sought to identify labor bottlenecks and changes in the sexual division of labor. By the end of 1986, the management was generally pleased with the project's impact on the regime of the household economy, specifically the intensification of family labor. This was not the case, however, with many Mandinka households. In fact, project officials were generally quite discouraged with labor patterns among the Mandinka, the preeminent rice cultivators, but regarded as the worst farmers.(11) Besides failing to perform irrigation activities on schedule Mandinka households have high rates of labor hire, which the management attributes to two attitudinal factors: i) the lack of a profit motive and ii) a greater desire for leisure. This discussion penetrates beyond surface behavioral descriptions to examine the origins of differences in current labor patterns among the project's ethnic groups.

On a general level, conflicts over family labor availability on the pumped fields are less likely to characterize the project's Wolof and Fula villages largely due to their smaller land allocation and upland cropping bias. All able family members labor in the fields, though the Wolof, who remain primarily groundnut farmers, employ day workers if there is a labor shortage. It is among the traditional rice cultivating groups, the Mandinka and Serrahuli, where the effects of contract farming are most visible. They received larger village land allocations based on previous tillage, and project development has triggered several adjustments in the organization of cropping strategies, which has affected household labor. In Serrahuli villages, where there is a tradition of remunerating females for their agricultural labor,(12) women's work on the pump-irrigated plots is rewarded with seasonal harvest gifts of paddy and/or usufruct to a tidal plot. Additionally Serrahuli men, unlike the Mandinka, formerly sometimes helped women during labor bottlenecks in rice cultivation. Women's rights to upland plots also led to a lessened dependence on female labor in the pumped-plots and a more balanced gender work distribution in Serrahuli households. Thus, the development of contract farming has

FIGURE 3

Observed Labor Input and Sexual Distribution of Labor of the
Various Agricultural Activities in the Jahaly Pacharr
Pump-Irrigated Plots

<u>Activities</u>	<u>No. of Labor Days per Plot</u>	<u>Activity Done in:</u>	<u>Labor</u>	
			<u>Men</u>	<u>Women</u>
Manual land preparation	2-4	1-4 days	50%	50%
Transplanting	15-20	1-7 days	20%	80%
First weeding	10-15	3-5 days	20%	80%
First top dressing	1-3	1 day	80%	20%
Second weeding	10-15	3-4 days	20%	80%
Second top dressing	1-3	1 day	80%	20%
Harvesting	15-20	4-5 days	80%	20%
Manual threshing with empty oil drum	<u>40</u>	7-8 days	50%	50%
	94 - 120			

Source: PMU data, Jahaly Pacharr Project 1986

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brought both men and women into the irrigated rice fields and led to an intensification of family labor. The Serrahuli, the ethnic group with the largest households, seldom use hired labor in the project. These patterns are quite different among the Mandinka.

As we have noted, Mandinka women were the most seriously affected by development of the Jahaly Pacharr project. Their rice fields were incorporated into the project, yet they had difficulty gaining control over the developed land. Moreover, they did not have access to upland cropping areas like women in the other ethnic groups. These circumstances weakened Mandinka women's bargaining position in evolving family labor arrangements but facilitated efforts to intensify their work burden within the household. Moreover, expectations for women to perform most of the rice cropping operations had historical precedence. Since the nineteenth century the Mandinka farming system has responded to economic commoditization by intensifying the use of two basic resources: tidal swamps and skilled female labor (Weil 1973; Carney 1986). Women's labor in lowland swamps enabled men to specialize in upland groundnut cultivation, while rice was grown only by women in low-lying swamps. The gender relations of production have been ruptured with contract farming and development of the Jahaly Pacharr project. The expansion of the market economy through the commoditization of the food staple has caused fundamental disturbances in Mandinka production relations. As in the past, the locus of Mandinka intra-household struggles is over control of female labor in rice areas.

In the first year of the Jahaly Pacharr project, Mandinka women provided most of the family labor on the pump-irrigated plots, as was foreseen by the project management:

...the women are better than men as far as transplanting is concerned and they are also better than men as far as working in the water..., so quite frankly we expect a lot of labor from women, more so than from men.(13)

But the women were not always successful in securing access to tidal plots or in being remunerated with harvest gifts. The development of the project, their awareness that its premise was to award them land, and their subsequent failure to obtain rice plots, deeply politicized Mandinka women, which was summarized by one, Mariama Koita, in a BBC documentary on the subject:(14)

"It seems this project is just like the Chinese one when we suffered before. We aren't going to put up with that again...I have this to say to you men. We women aren't going to accept the way we have been treated in the past. We were asleep then. But now we are awake."

After the project's first year of operations, Mandinka women decided to exert pressure on household heads to improve their economic position in the project. Specifically, they demanded compensation for their labor on the irrigated plots. Their request varied from village to village and was usually related to whether or not they had usufruct to tidal plots or swamp rice land outside the project. In one village where all the rice land had been absorbed into the project, women demanded 25 percent of the product.⁽¹⁵⁾ The next section discusses the three main changes that have occurred in female labor availability among Mandinka households during the last two years.

LAND ACCESS, FEMALE LABOR, AND THE TRANSFORMATION OF PEASANT PRODUCTION

The threat of female labor withdrawal from the irrigated plots in early 1985 was to lead to significant changes in the relations of agricultural production in the project's Mandinka villages. This section has three objectives. First, it charts the principal transformations that contract farming brought about in the form of household production. Second, it demonstrates the manner in which these changes affected the availability of family labor and the ability of the household head to effect an intensification of dependant members' labor. Third, it links the evolution of new forms of peasant production to the resolution of these intra-household conflicts.

Preproject Production Forms

Prior to development of the Jahaly Pacharr project, area farmers produced for both subsistence and cash needs. While most households were involved in the market economy through sale of groundnuts, agricultural household reproduction was mediated through the traditional social structure rather than through the process of commoditization. Household reproduction occurred primarily through direct non-monetary ties to other farm units

rather than through a context of high mobility of land, labor and credit, which describes simple commodity production. Thus, on a gradient of forms of peasant production from subsistence agriculture to simple commodity production, the mixed food/cash cropping complex characterizing preproject agricultural strategies is referred to as independent household production.(16)

Though direct reciprocal ties for renewal of the means of production and subsistence have not been severed in the project's Mandinka households, certain ruptures are now visible that are changing the form of peasant agriculture. In some cases differences in access to land among family members has led to female labor mobility, and wage labor markets have developed. In other households rudimentary sharecropping arrangements have emerged. Thus, contract farming has set forth changes in land, labor, and credit, which are liberating the factors of production from mediation through the traditional social structure. This is an essential step in the evolution of peasant farmers into simple commodity producers.

The main impact of contract farming has been on the household labor process. Given the long-range political importance of Jahaly Pacharr as well as limitations on the government's ability to take control of rural land, the project was aimed at smallholder farm families. Productivity goals were tied to the availability and intensification of family labor. Since land usufruct is linked to repayment of the seasonal credit and the project has the right to evict farmers from the land for failure to repay it, farmers must command supplemental labor to meet production goals. But contract farming has precipitated structural changes in the organization of household production, which has conditioned labor availability. These changes are particularly visible among the Mandinka.

The primary historical responses among the Mandinka to commoditization of the farming system have been: i) a restriction on women's access to upland plots and ii) a reliance on female labor in lowland rice cultivation. Contract farming in the Jahaly Pacharr project has caused Mandinka households to make yet another adjustment to agricultural commercialization. With the transformation of rice from a food to a cash crop, for the first time women's access to rice plots has been restricted. While the lack of alternative lowland areas has provided the context for household heads to exert a greater control over female family labor, women have struggled to defend their traditional resource and crop rights within the farm unit. Thus the accommodation to economic change has been rife with intra-household conflicts between senior males and dependent females. These factors were chiefly responsible for the types of changes that occurred in production relations in the project's Mandinka villages.

Mandinka households have responded to women's demand for labor compensation in one of three principal ways. The variations are primarily due to differences in control over resources, particularly land, between farm units. The three major types of accommodations in Mandinka villages to women's demands are:

- 1) Women provide labor as needed on the pump-irrigated plots and receive compensation by gaining the usufruct to and control over the crop rights of the tidal irrigated plots.
- 2) Women provide labor as needed on the pumped plots, but since no tidal areas are available for cultivation, they are compensated in paddy, receiving a fixed share of the pumped-irrigated plot's yield for their labor.
- 3) Women seldom or never provide unremunerated labor in the pumped plots. The household head does not give labor compensation in paddy or tidal plots.

The first adaptation has already been discussed. Such households are usually resource sufficient controlling adequate rice land for both subsistence and cash needs. Their reproduction continues to be based on the renewal of reciprocal ties for production and subsistence, and the form of agricultural strategies remains characterized by independent household production. Given the large numbers of villages participating in the project and the fact that tidal land is still being developed, it is difficult to estimate the overall percentage of Mandinka households in this category. In the one village extensively surveyed, Wellingara, about 25 percent of the farm units remain independent household producers. The next section concentrates on the impact of the latter two adjustments, which are leading to new forms of peasant production in the project.

Rudimentary Sharecropping Arrangements

Among the Mandinka households that do not have much irrigated land, there have been two major adaptations to women's demand for labor compensation. In the first of these, female family members have been able to negotiate a rudimentary sharecropping relationship with the household head. In exchange for their unrestricted labor on the pumped fields, women are given a fixed percentage of the plot's yield. They are also

relieved of the need to provide rice for household needs. This adaptation thus rewards women for their overall labor productivity. The percentage of households involved in such arrangements cannot be specified, however, since the fieldwork period was too short to conduct an extensive survey in the project's numerous Mandinka villages. In the one village systematically analyzed, Wellingara, sharecropping was found in about 20 percent of the households. The percentage of the yield women receive under such arrangements varies, usually from 10 to 25 percent. On an irrigated plot with average productivity women received paddy valued from 150 to 500 dalasis per year (US \$20-\$66), although this varied widely and was correlated with overall plot productivity.

Female Labor and Wage Labor Markets

In Wellingara most households, however, were not able to offer women compensation for their labor. This was particularly true in resource-poor households that share an irrigated plot and barely meet subsistence rice needs, but it was also observed in households that had adequate land and produced surpluses for sale. In these households women now seldom provide labor on the fields. When they work on the pumped plots, payment in cash or paddy is demanded. Consequently, female labor withdrawal has had a number of repercussions on household production.

First, it has led to an intensification of male labor in the fields. But given the high rate of polygamous marriages in the area, men cannot make up for the loss of skilled female labor through an intensification of their own. Thus, the project management's claim that Mandinka males are spending more time in the rice fields than in previous years and doing some of the cropping activities formerly associated with female labor (transplanting and weeding) is indeed true, but rather than an indication of overall intensification of family labor in rice cropping, it is a response by male household heads to the loss of female labor.

A second repercussion of female labor withdrawal is that many Mandinka farm units are having difficulties adhering to the project's cropping schedule, which is often responsible for lowered yields. This is particularly evident during the rainy season when men plant their groundnut cash crop. The need to recruit external labor is not only linked to problems in the cultivation cycle but is also the basis for the project management's oft-repeated remark that the Mandinka are the worst farmers.

These two factors have conjoined to restructure household production relations, a third major consequence of female labor withdrawal. This has led to a great increase in the use of hired labor in Mandinka villages. The evolution of the changes that

have taken place during the last two years will be outlined for one Mandinka village, Wellingara.

Even in the project's first year most Mandinka villages were unable to complete the irrigated cropping activities without recourse to external labor. Only 25 percent were able to rely solely on family labor (Carney 1986). From 1984 through 1986 the percentage doing so has remained quite consistent (Table 6). But the changes during the last two years in female labor availability have led to an increase in the number of activities for which hired labor is employed. Table 7 shows that in 1984 most labor hire was for transplanting and weeding, while in 1986 this has expanded to include the other two key labor bottlenecks, harvesting and threshing. This is where the withdrawal of female labor has had a noticeable impact on household production. Table 8 presents a rough estimate of the seasonal costs of hired labor for the farm unit. Annually the majority of households spend between US \$28 to \$84 for hired labor, which costs approximately three to ten percent of an average plot's annual production (5.6 tons per hectare, see Figure 4).

Although there has been a great deal of male migration into the Jahaly Pacharr project since the early stages of its development, (17) most of the village labor hire is female. In Mandinka households where women have been denied access to land and therefore withdrawn their uncompensated labor, their primary economic activity is wage labor in the rice fields. Here, direct reciprocal ties for access to the means of production have been ruptured, and women now depend more on labor markets to meet their economic needs. This is transforming the form of peasant production in such households and leading to dramatic changes in women's economic options.

The development of wage labor has led to a breakdown not only in reciprocal labor arrangements within the household, but also to an erosion of women's traditional labor networks between households. Formerly, village women's age grades (known as kafos) provided large labor groups for rice transplanting. The money collected was used for common purposes, such as financial assistance in time of need or for collective celebrations. At other times the work group functioned as an auxiliary labor reserve for women who were sick, childbearing, or otherwise unable to go to the fields. Nowhere are the effects of the project's changing production relations more visible than in the transformation of the structure of women's kafos. For females dispossessed of rice land and currently working for hire in the rice fields, the kafos now function as work groups. They provide an organizational framework in which women pool their labor for hire in transplanting, weeding, or threshing. In contrast to the preproject period, the money collected is no longer retained for the group's mutual purposes but divided up among the individual women members. By forming work groups women are able to receive

TABLE 6

Percentage of Households Using Hired
Labor on Pump-Irrigated Plots

1984 and 1986: Wellingara

<u>Year</u>	<u>Percentage</u>
1984	70
1986	71

Source: Fieldwork data

TABLE 7

Percentage of Hired Labor per Activity
 Pump-Irrigated Plots, 1984-1986

<u>Activity</u>	Year	
	<u>1984^a</u>	<u>1986^b</u>
Transplanting	67%	66%
Weeding	29%	29%
Harvesting	42%	61%
Threshing	21%	63%

^a Sample: 63% households in Wellingara

^b Sample: 93% households in Wellingara

Source: Fieldwork data

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TABLE 8

Cost of Hired Labor Per Pump-Irrigated Plot,
Wet Season 1986 (Wellingara)

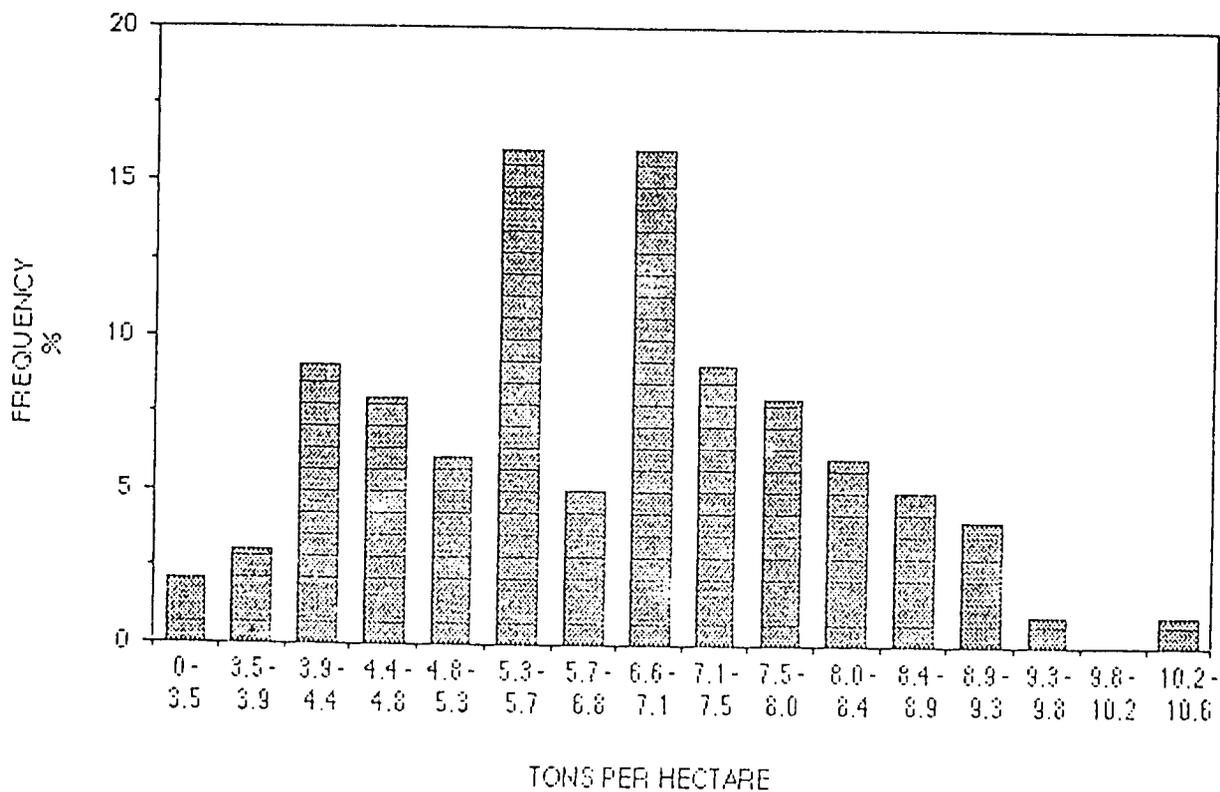
<u>Dalasis</u>	<u>US Dollar Equivalent</u>	<u>Number of Households</u>
50- 99	7-14	3
100-199	14-28	10
200-299	28-42	11
300-399	43-57	2
400-490	50-70	<u>2</u>
		28

Source: Fieldwork data, 1987

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Figure 4

DISTRIBUTION OF RICE YIELDS PER HECTARE
WET SEASON 1984
PUMP-IRRIGATED PLOTS, JAHALY-PACHARR



Source : Based on preliminary findings from IFPRI-PPMU Survey on Agriculture, Consumption and Nutrition from 10 sample villages of Jahaly-Pacharr project area (1984-1985). Sample involved 174 households, 2,809 individuals.

a better rural wage than as single workers. For example, for transplanting, a group of twenty women usually charge 80 dalasis per irrigated plot, and they are able to complete two plots in one day. Each woman then makes eight dalasis instead of five, the daily wage labor rate.

Another way in which these women are adapting to a semi-proletarianized status is to rent irrigated land in the small-scale perimeters that were developed before Jahaly Pacharr. While the areas had been steadily falling out of production since the 1970's, the development of the Jahaly Pacharr project accelerated the process. This was due to the fact that land ownership in both types of projects has been concentrated under control of the traditional elites, who lack adequate household labor to keep all the perimeters in production. Since failure to cultivate can cause loss of usufruct, land-rich households have given primary attention to the project's plots. Owners of the small-scale perimeters have therefore had to reduce their cultivation, which has made them increasingly available for rental. Rental of irrigated land in the schemes is dated to about eight years ago when rice-growing migrants began renting the plots during the dry season.(18) Since the development of the Jahaly Pacharr project and the availability of more irrigated land for rent, Mandinka women also have begun renting plots in the small-scale irrigation schemes.

While production on these perimeters has suffered due to chronic nation-wide shortages of diesel and spare parts for the pumps, if fertilizers are purchased and inputs are available on a timely basis, yields can rival those on the Jahaly Pacharr plots. The main factor keeping women from renting, however, is not plot availability but the cost. Depending on the plot's size, rental rates vary from 30 to 50 dalasis while another 50 dalasis is charged for the pump's diesel fees. Even if a woman is married to a man with irrigated land for rent, she usually pays the prevailing rental fees. These observations underscore two important facets of the local social structure of production: i) the separation within the household of economic activity among family members and ii) limitations on the ability of the benefits of economic development to trickle down to dependents. Projects designed on the basis of family labor and a perceived mutuality of interests may thus not only fail to command the anticipated family labor but may also seriously undermine the economic independence of dependent household members, even if they contribute to overall food security.

A final way women are adapting to the changes brought forth by development of the Jahaly Pacharr project is to assert their claim to rice land outside the project area. This is particularly evident in the low-lying areas coterminous to Pacharr swamp. In many of the unclaimed or unutilized portions, there has been a land scramble by women to mark and define

production areas. For many, this is the only land they have for rice cultivation. These fields abut the project's irrigation canals and sometimes benefit from spillover. Whether or not the crops succeed, women plant as a means to secure their individual rights to the land. Should the area become absorbed into the project, women will not easily relinquish their control, which they consider their individually-owned land. These plots are known as tesito fields, the name deriving from the government ruling party's political slogan, "pull in one's belt," to achieve mutual objectives. Here, the term has been interpreted to mean "self-help" areas--places where women take it upon themselves to ensure better conditions by using their labor and effort to defend their claims to local resources.

SUMMARY OF CONTRACT FARMING ON HOUSEHOLD PRODUCTION DYNAMICS

The main impact of contract farming on production dynamics within project households has been on the social organization of family labor. A variety of arrangements have developed, but the most significant changes are evident among the Mandinka, who had a particularly marked gender basis to crop cultivation. In some villages the commoditization of the food crop, rice, has led to the emergence of labor markets, primarily comprised of semi-proletarianized female workers. While the loss of access to land has politicized women and caused them to take efforts to secure what they still control, there has been a breakdown in women's ability to use nonmonetary ties in the social structure to mediate their access to the means of production. The barter or sale of their labor power is becoming an integral component of women's ability to meet their economic needs. A consequence of these changes in female labor availability and use is the evolution of new forms of peasant production in the project area.

The development of new production relationships in Jahaly Pacharr derives from the manner in which contract farming affected the social structure of production. This is definitively linked to ethnic differences as well as to the resource strategies of different groups. Those ethnic groups that had the most diverse economic base and a less structured gender basis to crop production and ecosystem access have better adjusted to contract farming. They have been able to effect an intensification of family labor with fewer structural conflicts. When this has not been the case--most notably among the Mandinka--the main impact of contract farming has been to restrict the access to rice land of certain household members (notably females) in order to gain control over their labor. For resource-rich households and/or those who have settled internal conflicts over women's labor and resource needs, incipient sharecropping production relations have emerged. But, for those households that are resource-poor or were unable to resolve the

internal conflicts that were unleashed with project development, females have lost access to rice land altogether. Currently their economic needs are being met through a diverse portfolio of activities--wage labor, vegetable marketing, irrigated land rental, and recently, the production for sale of sesame seed.

Finally, three issues are of long-term theoretical and policy interest: first, whether the sharecropping and wage labor developments in Jahaly Pacharr are unique to the Jahaly Pacharr case or can be found generally in other contract farming schemes; second, the ability of such arrangements to fulfill the project's productivity goals and loan repayment guidelines; third, whether or not changes in the social structure of production will promote productive investment and real growth in the nation's agricultural sector.

PART III.

IMPACT OF THE JAHALY PACHARR PROJECT ON ECONOMIC DEVELOPMENT

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CONTRACT FARMING AND ECONOMIC GROWTH

This concluding section of the study is concerned with two issues. The first is the local, regional, and national impacts of contract farming on agricultural production. The second is an assessment of the risks, growth, and equity consequences of contract farming in the project.

The Jahaly Pacharr project has had far-reaching impacts on Gambian agricultural production. It has changed the social organization of smallholder production, influenced regional farming practices, and been instrumental in guiding national agrarian policies. The main dimensions of the impacts are reviewed below.

IMPACT OF CONTRACT FARMING: National

A most significant question regarding Jahaly Pacharr is whether or not the government of The Gambia has the resources to manage the project once donor funding and technical assistance expires. The project management unit currently receives a fuel subsidy from donors, while spare parts and machine repairs are managed by the Dutch. The Gambia, meanwhile, continues to experience chronic nation-wide fuel shortages, which contributed to the failure of the small-scale irrigation schemes. Moreover, although funds were allocated to train Gambian counterparts to the European staff, their selection reflected political and nepotistic considerations more than skill levels. As a result, the project does not have a complete Gambian staff that can manage the financial and agronomic operations when the Dutch leave. Given the negative historical experience with pump-irrigation in The Gambia and elsewhere in Africa, and the country's strained financial resources, it is not clear that it can afford to operate a project like Jahaly Pacharr without continued donor support in fuel subsidies, spare parts, and technical expertise. The consequences of any failure, however, will be borne most heavily by the local farmers. Unlike the earlier schemes, the Jahaly Pacharr project is a massive engineering structure that has radically transformed the landscape. This prevents the plots reverting to wet season, tidal-irrigated use as swamp rice fields.

In 1985/1986 the Jahaly Pacharr project supplied about 4,000 of the 23,000 tons of paddy domestically produced in The Gambia (Table 9). Although the project is not yet completed (scheduled for mid-1987), it has fallen quite short of generating the 7,000 tons originally projected, which limits its foreign exchange

TABLE 9

Crop Production Pattern for the Period 1974/75-1985/86 and Arable Land

CROPS		74/75	75/76	76/77	77/78	78/79	79/80	80/81	81/82	82/83	83/84	84/85	85/86
Upland Paddy	C	-	-	-	21.40	22.10	9.20	2.00	4.60	4.80	4.50	2.00	3.50
	H	-	-	-	-	-	4.90	1.50	4.20	4.30	3.30	1.50	3.10
	Y	-	-	-	661	1097	537	1200	1129	969	792	1447	1160
	P	-	-	-	14.10	24.20	2.60	1.80	4.70	4.10	2.60	2.20	3.60
Swamp Paddy	C	23.20	25.40	21.70	-	-	14.50	22.50	24.00	24.70	14.80	6.90	8.50
	H	-	-	-	-	-	10.30	17.30	22.30	22.90	10.20	6.20	-
	Y	1125	1067	613	-	-	1699	1462	1251	1296	1774	1450	1590
	P	26.10	27.20	13.30	-	-	17.50	25.30	27.90	29.60	18.10	8.90	11.70
IRRIGATED A. Small Schemes	C	-	-	1.10	0.80	0.80	1.90	-	-	-	1.30	2.90	0.80
	H	-	-	-	-	-	1.90	2.90	1.30	-	1.30	2.90	0.80
	Y	-	-	4349	4064	5131	4869	5390	5059	-	4207	5590	4780
	P	-	-	4.70	3.10	4.10	9.30	15.60	6.90	-	5.40	16.10	3.90
IRRIGATED B. Jahally/ Pacharr	C	-	-	-	-	-	-	-	-	-	-	-	0.90
	H	-	-	-	-	-	-	-	-	-	-	-	0.90
	Y	-	-	-	-	-	-	-	-	-	-	-	4130
	P	-	-	-	-	-	-	-	-	-	-	-	3.90
TOTAL PADDY	C	23.20	25.40	22.80	22.20	22.90	25.60	24.50	28.60	29.50	20.60	11.80	13.70
	H	-	-	-	-	-	17.10	21.70	27.80	27.20	14.80	10.60	12.10
	Y	-	-	-	-	-	-	-	-	-	-	-	-
	P	26.10	27.20	18.00	17.20	28.30	29.40	42.70	39.50	33.70	26.10	27.20	23.00
GROUNDNUT	C	104.8	98.80	107.6	105.4	106.2	96.90	82.50	92.50	98.50	110.0	98.50	65.90
	H	-	-	-	-	-	67.80	68.90	60.70	95.00	97.20	91.40	58.50
	Y	1385	1429	1329	949	1256	985	874	1349	1593	1172	1150	1290
	P	145.2	141.1	143.0	100.0	133.4	66.90	60.20	108.9	151.4	113.8	105.1	75.80
COTTON	C	-	-	-	-	1.7	1.0	-	-	-	2.0	3.20	4.60
	H	-	-	-	-	-	1.0	2.30	2.60	2.80	1.4	-	-
	Y	-	-	-	-	506	904	603	1034	873	820	3253	3180
	P	-	-	-	-	0.90	0.90	1.40	2.70	2.40	1.20	1.00	0.70

C = Cultivated area in '000 ha

H = Harvested area in '000 ha

Y = Yield in kg/ha

P = Production in '000 tonnes (production of cereals in grain form; groundnut is in undecorticated form).

Swamp and Upland Rice

Source: PPMU (Ministry of Agriculture), 1986.

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savings capacity. Even more significant for the project's import-substitution objectives is the amount officially marketed to the cooperatives. Table 10 presents sales of paddy to the project's cooperatives for the last three years. These figures indicate that less than half the estimated project production is being sold, suggesting that producers are selling little more than that needed to cover their loans. The rise in sales in 1986 is related to two factors: 1) the ending of the government's cheap food policy that depressed the consumer price below that of neighboring countries and 2) the stabilization of the dalasi, which had been floating in 1985. During that year, it was estimated that fifty percent of the project's paddy production went to Senegal where rice prices were higher and farmers received hard currency for their sales. Higher paddy sales in 1986 reflected a stabilization of the nation's macro-economic situation, but the amount marketed does little to address domestic rice needs.

While the project has not greatly improved rice-import substitution in The Gambia, it has proved to be popular politically.⁽¹⁹⁾ For the three-quarters of the farmers who produce over five tons per hectare (Figure 5), incomes have doubled or tripled since participation in the project. An even greater percentage of farm families have been able to achieve rice self-reliance. In spite of the uneven rewards from rice cultivation among rural households and between family members, the project enjoys the support of most farmers because it has improved household subsistence security.

Contract farming has demonstrated its effectiveness in enabling the state to achieve two long-sought objectives: 1) the implementation of double-cropping in the regional farming system and 2) good loan repayment rates in the irrigation sector. Jahaly Pacharr's pump-irrigated plots have experienced nearly a 100 percent seasonal cropping rate--a major improvement over the small-scale irrigation perimeters, where on the average only 33 percent are planted in the dry season and 10 percent during the rains. Moreover, contract farming has vastly improved the loan recovery rates in irrigated rice. On Jahaly Pacharr's pumped plots, loan repayment is nearly 100 percent (Table 11). On the small-scale perimeters the figure averages about 30 percent (Damba, personal communication).

On contract farming's role in the government's overall objective to restructure peasant agriculture to simple commodity production, a few preliminary observations can be made. Rice has certainly emerged as the second cash crop of The Gambia. When the government follows cheap food policies, rice even becomes a valued export crop to project farmers. Contract farming has thus far succeeded in intensifying commodity production by extending farmers' agricultural calendar, but the change in agricultural

TABLE 10

Paddy Sales to Co-operatives, Jahaly Pacharr

<u>Season</u>	<u>Year</u>	<u>Tons paddy (metric)</u>
Dry	1984	699*
Dry	1985	1177
Wet	1985	1200
Dry	1986	1786
Wet	1986	2000 (estimated)

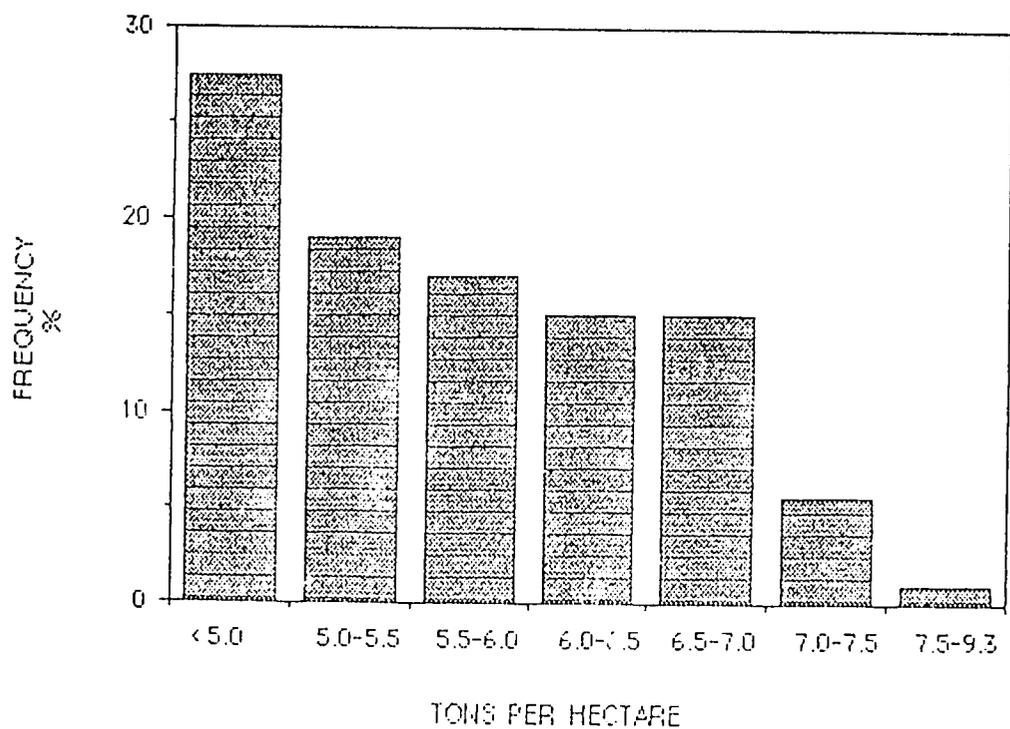
* This figure reflects the reduced acreage planted in the 1984 dry season: only half Jahaly swamp or about 220 hectares.

Source: Jahaly Pacharr Cooperatives

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Figure 5

DISTRIBUTION OF
RICE YIELDS PER HECTARE
WET SEASON 1986
PUMP-IRRIGATED PLOTS



Source: Project Management Unit Data

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TABLE 11

Credit Issues and Loan Repayment, Jahaly Pacharr
Irrigated Plots, Wet Season, 1985

<u>Swamp</u>	<u>Due (dalasis)</u>	<u>Recovered</u>	<u>Percentage Received</u>
Jahaly pump	491,146.84	471,612.74	96.16
Pacharr pump	137,160.96	137,160.96	100.00
Pacharr rainfed	240,711.06	193,949.05	80.38

Source: Project data.

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strategies must be understood in the context that the crop produced is also the dietary staple.

Besides intensifying farmers' labor in cash-crop cultivation through an extension of the agricultural calendar, the second component of the government's goal to transform smallholder agriculture is to diversify commodity production. The Jahaly Pacharr project was designed to get farmers to grow a second cash crop, not one that will replace groundnut production. From the early stages of project design, irrigated rice farming was envisaged as complementary to upland groundnut production, and the fundamental plot size was calculated on the labor units needed to perform both activities (EUROCONSULT 1980). Official concern continues over the project's consequences for groundnut production. One recent survey indicates that villages with high per capita irrigated rice production have low per capita groundnut production (Table 12). The project management has consequently implemented two mitigative actions. The agronomy unit now adjusts the irrigated cropping schedule to minimize labor bottlenecks with groundnut cultivation. Additionally, a farming systems expert has been appointed to examine social constraints to specialized commodity production and to make proposals for harmonizing groundnuts with irrigated rice cropping.

A recent project document clearly develops the role envisaged for the Jahaly Pacharr project in the transformation of local smallholder production (EUROCONSULT 1986). The report, concerned about the narrowed production focus of the project management, calls for a greater sensitivity to the social dynamics of the farming system--particularly the impact of irrigated rice on upland cropping. Yet the term "upland cropping" is restricted to mean groundnut cultivation. The report's conclusions in favor of specialized commodity production by project farmers is based on the rather shaky assertion that the traditional upland cereals are erosion-causing while monocropping groundnuts promotes soil-conserving practices (Report #6, 1986). (20) Behind the document's recommendations is a strong commitment to orienting smallholder agricultural strategies to specialized commodity production on both the uplands and lowlands.

The ability of contract farming to achieve double cropping and loan repayment has had one final impact in the arena of national agrarian policies. It has caused the government to forge ahead with plans to rehabilitate the 2400 hectares developed in small-scale perimeters. Since only about a third of them are now in operation and experience poor loan recovery rates, the government has devised a rehabilitation plan to standardize plot size in 0.5 hectare units so that they function and operate like Jahaly Pacharr. The schemes will also be organized under centralized pumping units and likewise be

TABLE 12

Production of Crops Per Adult Equivalent Person by Village
(in kilograms)

<u>Village</u>	(kilograms per adult equivalent)						<u>Ground-Nuts</u>
	<u>Jahaly Pacharr rice</u> <u>Wet and Dry Seasons</u>	<u>Chinese Rice</u>	<u>Traditional Rice</u>	<u>Upland Cereals</u>	<u>Total Cereals</u>		
Njoben	176	4	2	235	417	461	
Pacharr	589	20	31	42	683	122	
Darsilameh	799	6	19	13	838	52	
Sinchou Abdou	244	43	15	120	422	259	
Sare Samba	138	-	132	177	447	240	
Sare Bala	196	9	35	147	387	333	
Sukurr	572	-	-	13	585	112	
Tubanding	<u>32</u>	<u>131</u>	<u>5</u>	<u>27</u>	<u>196</u>	<u>50</u>	
TOTAL	394	22	118	106	550	233	

Source: IFPRI 1986

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provided a diesel fuel and pesticide subsidy during the first five years. Currently the plots are owner-operated. While there are no plans to attempt a negotiated lease, the government hopes to effect control over producers by tying them to production loans negotiated through the cooperatives, which have the legal right to evict farmers for defaulted loans. The key to the government's goal is to establish the principle under the prevailing customary land tenure system that "developed" land belongs to the people of The Gambia and farmers will no longer have the right to use it unproductively. The most important implication of the proposed strategy is that it will extend the production package implemented in Jahaly Pacharr to another 17 percent of the rural population (FAO/ADB 1986).

Regional

The Jahaly Pacharr project has had several economic consequences for regional development. First, it has led to a high rate of in-migration, mostly rural to rural, from within The Gambia, neighboring francophone countries and Guinea Bissau. Population growth rates, which exceed the national rate of annual increase (3.5 percent), are calculated for the region in Table 13. Many of the migrants are small-scale traders and businessmen, who offer goods and services that were not available before the project's inception while others are involved in private marketing and transport of producer paddy.

A second important impact of Jahaly Pacharr is the interest it has generated regionally in irrigated rice cultivation. Many migrants from rice-growing areas of western Gambia, Casamance, Senegal, and Guinea Bissau have come to the project area to rent the small-scale perimeters that have become available since project development. In one village, Kerewan Samba Sira, there are several small-scale schemes that are operating primarily because of the influx of migrants who rent rice plots in the dry season. This rice is usually not sold but used for subsistence needs. Their income from groundnut cultivation, palm wine tapping, or trade is used to subsidize the rental of irrigation perimeters. The Jahaly Pacharr project thus has had a positive impact on increasing regional interest in i) double-cropping and ii) irrigated rice cultivation.

A final important impact of Jahaly Pacharr has been on the development of backward and forward linkages to the project. The Jahaly Pacharr project grows, markets, and stores paddy, but it does not mill it. Instead, the cooperatives transport the paddy across the river to the government mill for processing. Much of the paddy sold locally, however, is processed by small, motor-driven mills, which are now found in the large trading villages. Owned by local businessmen, the mills are also widely used by

Table 13 Jahaly Pacharr Project Population Estimates 1973-1983		
Villages: Jahaly Swamp*		
	1973	1983
1. Jahaly	628	822
2. Jahaly Madina, Madina Unfally	1,186	1,539
3. Saruja	891	1,522
4. Brikama Ba ¹	702	1,988
5. Sukurr	240	229
6. Walikunda	109	41
7. Boiram	661	993
8. Brikama N'Ding	375	531
9. Darsilami	231	618
10. Njoben	581	861
11. Sinchu Magai	165	157
12. Sinchu Madado	238	341
13. Wellingara Kejaw	231	263
14. Sinchu Bamba	134	156
Total	6,372	10,161
Annual Rate of Growth = 6.0%		
Villages: Pacharr Swamp*		
	1973	1983
1. Pacharr	626	813
2. Faraba	318	449
3. Madina Sisay Kunda	135	108
4. Sinchu Dembel	160	177
5. Taifa Amadu	261	281
6. Fula Bentang	240	571
7. Sare Yoro Tacko	174	273
8. Taifa Saikcu	459	477
9. Tabanding	121	213
10. Kerewan Samba Sira (Fula and Mandinka)	831	1328
11. Sare Fula	167	282
12. Madina Sinchu Yoro	167	282
13. Sinchu Bora	126	130
14. Fass Abdou	300	362
15. Boweh Fula	136	65
16. Alluldi	217	633
17. Gidda	186	243
18. Wellingara Adam	108	123
19. Kur Kur Yoro Mbellow	211	224
20. Kusalang	159	171
21. Jamagen	183	280
22. Kahow	200	320
23. Sare Ngai	406	487
24. Batang Nyema	151	215
Total	6,157	8,295
Annual Rate of Growth = 3%		
Both Swamps Total		
	12,529	18,456
Annual Rate of Growth = 5%		
¹ Brikama Ba is located on the main trans-Gambian road and is the major commercial center for the Jahaly Pacharr project. Growth reflects the importance of the project on the region.		
*Data not available for a few project villages, with population < 99.		
Sources: 1973 Census and 1983 Census, preliminary data.		

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farm families, who pay one unit of paddy (cups, sacks, bags) for each nine received. Besides rice mills, at this stage few other economic linkages exist since the project is still being managed with Dutch technical assistance, who handle all machine repairs and other infrastructural needs.

Local

Development of the Jahaly Pacharr project has had a number of consequences for local producers. While it has exacerbated gender and generational differences in access to resources among family members, it has also contributed to household food security. In this section the project's impact on rural development will be examined with a particular focus on differences in economic growth that have emerged between participating households.

The project management has calculated that a farm unit must produce at least four to five tons of paddy per hectare in order to repay the seasonal loans, fulfill subsistence needs, and generate marketable surpluses. But as Table 14 demonstrates, overall yield declines, since the project's first year, have narrowed average production to the margins of this range. Figure 5, which presents the distribution range for the 1986 wet season harvest, illustrates two points: 1) very high yields are technically possible in the project, with some pumped plots reaching over nine tons per hectare; and 2) about one-fourth of the farmers cultivating the pump-irrigated plots are on the margin of, or fall below, the minimum range for project goals. Within this group, about ten percent of the households are experiencing serious difficulty in loan repayment, while an additional five percent are unable to fulfill subsistence needs.

The project's extension services are not a cause of lowered yields for participating households. The ratio of farmers to agricultural assistants, 290:1, appears adequate for information diffusion. The network of agronomic assistance has also been improved by the appointment of contact farmers for each ten-hectare block. It is their responsibility to inform co-villagers of the dates for demonstration techniques and key irrigation operations. The variation in yields in Jahaly Pacharr plots is due to a range of factors, some technical, but mostly social and economic.

Real economic growth in Jahaly Pacharr depends on the overall impact of contract farming, specifically its effect on households of all socio-economic groups. On the majority of plots, which experience good yields, subsistence requirements and

TABLE 14

Average Yields Pump-Irrigated Plots, Jahaly Pacharr

<u>Season</u>	<u>Year</u>	<u>Yield/hectare</u>
Dry	1984	7.5 tons
Wet	1984	6.5 tons
Dry	1985	5.7 tons
Wet	1985	4.0 tons
Dry	1986	5.7 tons
Wet	1986	est. 4.8 tons

Source: Project Management Unit, Jahaly Pacharr Project

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marketable surpluses are possible with contract farming. Table 15 presents the breakdown in use of the disposable surplus for those farm units with average production rates. Farmers claim that one-third of the harvest goes for loan repayment and about 50 percent for consumption, while the remaining 15-20 percent is surplus. Moreover, the International Food Policy Research Institute's (IFPRI) 1985 survey of 10 sample villages (174 households, 2,809 individuals) demonstrates that these patterns are rather consistent between villages with few significant ethnic differences (Table 16). But for the ten to fifteen percent of households falling below production goals, often there is not enough rice after loan repayment to cover subsistence needs. These "problem" project households fall into three general categories: i) a minority whose plots experience technical problems; ii) those with too much project land in relation to available labor; and iii) households that have too little land to meet their subsistence and economic needs. Contract farming has had different repercussions for each of these groups.

There are a few pump-irrigated plots in the project where yields fail or are diminished due to poor drainage or uneven land levelling. For a variety of reasons the project management has not managed to correct the problems in such plots. But the farmer is nonetheless expected to cultivate each season and repay the production loan. If not, eviction is threatened. This is quite a different approach than that established on previous irrigation projects. For example, in the small-scale perimeters if a farmer can prove that crop failure is due to reasons outside his control (including the government's failure to deliver inputs on time), the production loan may be cancelled. This is not done in Jahaly Pacharr. Loans must be repaid in full, irrespective of cause. In these cases, the ability to remain in the project will depend on whether the farm unit can command the necessary funds to cover the seasonal loan when there is crop failure.

In general, the cropping problems in the remaining Jahaly Pacharr households are linked to the original inequitable land distribution, not only to differences in plot awards between farm units, but also to household adjustments to women's loss of control over rice plots. As we have seen, household adaptation to women's demands for labor compensation was related to three key factors.

1. The ethnic group involved, specifically inter-ethnic differences conditioning women's access to upland farms.
2. The degree of resource control achieved by the farm unit in the original land distribution. Those households with one or more pumped plots and tidal irrigated land had a great deal more flexibility in compensating women for their labor than those with limited access to plots.

TABLE 15

Use of Harvest by Crop (1984/85)

<u>Purpose</u>	<u>Irrigated rice wet season</u>	<u>Rainfed/tidal rice</u>	<u>Chinese rice</u>	<u>Traditional rice</u>	<u>Early millet</u>	<u>Sorghum</u>	<u>Maize</u>	<u>Groundnuts</u>
			(in percentages)					
Rent	0.00	0.00	0.00	1.40	0.00	0.00	0.00	0.30
Loan repayment	30.10	34.20	5.70	0.40	0.00	0.60	0.40	2.50
Hired labor	1.40	1.60	3.10	1.20	0.40	0.00	0.10	0.10
Gift	6.50	5.80	9.30	10.70	10.40	8.30	13.10	3.50
Sold	6.70	15.40	7.80	18.60	2.80	0.00	3.60	70.70
Consumed	53.10	39.10	69.50	62.80	84.50	88.50	82.90	12.20

Source: IFPRI 1986

TABLE 16

Use of Harvest for Consumption and for Sale by Villages
Jahaly Pacharr

<u>Village</u>	<u>Irrigated Rice</u>		<u>Groundnuts</u>		<u>Ethnic Group</u>
	<u>Consumed</u>	<u>Sold</u>	<u>Consumed</u>	<u>Sold</u>	
Njoben	56.7	27.1	9.3	75.9	Mandinka
Pacharr	53.1	35.8	16.8	63.00	Wolof
Darsilameh	49.1	43.1	22.9	69.0	Wolof
Sinchou Abdou	65.3	29.2	14.2	78.3	Mandinka
Sare Samba	62.8	31.4	11.2	75.2	Fula
Sare Bala	60.8	35.1	12.1	76.4	Fula
Sukurr	58.2	34.3	31.3	61.9	Serrahuli

(in percentage of total production)

Source: IFPRI, p. 14, 1986

3. The internal dynamics between family members within a farm unit. When the conflicts could not be resolved between men and women, females withdrew their labor, which contributed to lower yields. Contract farming has begun to affect each group in quite different ways.

Most of the households with multiple project plots that experience yield problems are usually not in trouble with loan repayment. In fact, there are few land-surplus households that do not pay their loans. The poor yields are primarily due to labor recruitment. For this group depressed yields result from two primary causes: i) either too much land was received relative to available family labor; or ii) the plot award was fair but a labor shortage has developed from the inability of the household to resolve internal conflicts over women's demands for labor remuneration. As we have seen, this second factor operates primarily in Mandinka villages. Among the land-surplus households, there are some that barely cultivate their plots. Project officials are well aware of who these farm units are, but despite pressure from the Dutch technical team to bring action against them, the management has been reluctant to do so. This is due to two principal reasons. First, generally the resource-rich farm units are the local elites and dominant political figures in village and regional power; and second, they do pay their loans. Plots with poor yields that fall within this category are not only an unproductive use of project land (and for that reason reminiscent of the problems that developed with the small-scale perimeters), but their low yields depress the technological potential of the project. Since such farm units are able to repay their loans, it is unclear how much muscle politically the project management will exert to reallocate these plots to poorer farm units.

The bulk of the households facing economic difficulties in the project, however, are those that are unable to achieve good yields because they are sharing a plot with other families. Generally, the labor on shared plots is not pooled, and each household's cultivation area delimited by bounds. Differences in the timing of activities and cropping patterns between subunits sharing a plot contribute to depressed yields. This is the agricultural group most at risk in the Jahaly Pacharr project. Many of them derive from the poorest socioeconomic stratum of participating villages. Project officials estimate that 15 percent of all the plots in trouble for loan repayment are sharing land. This group is the least likely to command reserve funds that can be mobilized for loan repayment when harvests are inadequate.

It is too early in project development to assess whether the project management will take action against the two types of problem households--those that fail to repay loans, and those that fail to cultivate or make little effort to do so. This

should become clearer in the months to come because the management has decided to begin disciplinary action first against the project's eighteen loan-defaulting households. Decisions on which cultivators will be evicted from the project, however, will remain primarily in the hands of the land allocation (land disciplinary) committees as well as elders from the concerned villages, therefore placing the outcome under the control of local elites. Potential plot loss, however, threatens more serious subsistence insecurity for the resource-poor households than for those able to repay their loans, because the project has absorbed most of the area's alternative rice-growing swamps. Their ability to find other food cropping sites in the region has now become quite limited.

The government's position on problem cultivators has been clearly formulated by the project manager:

The only reason why government must maintain lease over the land is if legally after all those investments one or two farmers have been found wanting then government must have the legal backing to tell them good-bye...just ask other farmers to come in...We are busy setting up these disciplinary committees. Because of the level of investment in the project we are not going to gamble with farmers who do not want to exert enough elbow grease to produce good yields. For those farmers we...will ask the disciplinary committees to deal with them and one of the ways is to eject them out of the project and invite better farmers to come in" (in BBC's Global Harvest, 1986).

The ability of many project households to meet production goals, however, does not depend solely on exerting elbow grease, or intensifying labor. It also depends on prevailing patterns of resource control. This includes the ability of the more vulnerable households to liquidate loans as well as inter- and intra-household patterns of labor control and land access. Finally, economic growth in the project will be determined by the way in which each socioeconomic group adjusts to contract farming production structures.

RISK ASSESSMENT OF THE JAHALY PACHARR PROJECT

1) The centralized management of the Jahaly Pacharr project has made farmers dependent on staff directives and guidance. Since there is no truly representative farmers' organization, project participants do not have any independent organizational structures to represent their needs when donor funding ceases.

2) Project farmers appear to be reducing upland food crop cultivation in favor of groundnuts. This limits the variety of food crops in the diet, increases agricultural risks, and makes farm units more dependent on commodity production for household reproduction.

3) Security of tenure. Even though the land originally belonged to local cultivators, the lease enables the Jahaly Pacharr management to evict farmers who do not meet loan repayment guidelines. Since the land is primarily a food-growing area for local farmers, its loss can bring serious nutritional repercussions to a household. The unavailability of alternate lowland rice areas limits the farm unit's ability to find alternative food-cropping sites.

SUMMARY REMARKS ON CONTRACT FARMING AND ECONOMIC GROWTH

To summarize, in the Gambia, contract farming has proven an effective mechanism for intensifying farmers' agricultural labor. This has been achieved in two principal ways: i) through an extension of the agricultural calendar to produce two crops per year; and ii) by increasing the farm unit's labor in production. But the intensification of the work regime has not always occurred as originally envisaged by project officials--through the over-exploitation of family labor. In many cases the household head has not been able to capture the labor of family members for crop production. In such instances, labor intensification has been achieved through the hire of wage workers. The problems that have developed in Jahaly Pacharr households over the availability and use of family labor to meet contract farming production demands have several implications for economic growth in the project.

First, they indicate that contract farming requires major adjustments in the social organization of the farm unit's crop production. The manner in which households respond to externally-induced pressures on the production unit may directly affect productivity. Labor has always been the most important production constraint in The Gambia, yet contract farming and the technological package introduced in Jahaly Pacharr demand an even greater work input from smallholders. This has necessitated major changes in the social organization of production in project households, which in turn has brought about some undesirable social and economic consequences. For instance, among the Mandinka, household heads sought to gain control over skilled female labor in rice production by restricting women's access to farm land. In some households this has induced internal changes in the domestic unit which have increased gender inequality in resource allocation and control between family members. Although such changes do not characterize the majority of project households, this study argues that they would have been more

prevalent if the crop produced were not the dietary staple. As we have seen, contract farming a food crop enabled most households to draw upon family labor from a tradition that operated within the Gambian farming system. It was primarily in those households that broke with this tradition, by no longer linking individual crop rights to the provision of labor, where the labor system on household fields collapsed. While this may appear to be a victory for those women who have withdrawn their labor from cultivation, they still provide most of the labor in rice production; only now they do not have their own land but instead form part of a work group, receiving a wage for their work. The ability of future contract farming schemes to effect an intensification of family labor will depend on whether the crop produced is consumed and also on the adjustments made within the household to the new labor demands.

Second, as a preliminary review of the Jahaly Pacharr project demonstrates, the ability of households to achieve desired productivity goals is strongly linked to the resolution of conflicts over labor. If the form of adaptation to contract farming leads to restricted resource access by family members and consequent labor withdrawal, crop yields and productivity may diminish. Moreover, if plot allocation in contract farming schemes awards some households too much land in relation to available labor, unproductive accumulation may contribute to lower yields. Thus, inter- and intra-household equity issues remain important in achieving productivity goals in smallholder schemes.

From the cultivators' point of view, the Jahaly Pacharr project is generally considered a success. It has greatly contributed to household subsistence security. From the state's perspective the project receives a more mixed review. It has accomplished some key objectives long seen as critical to the transformation of peasant production, such as double cropping and loan repayment, but the project has not contributed significantly to rice import-substitution needs. Producers sell to the cooperative little more than that required to repay loans. Most of their surplus sales continue to be transacted with local traders, and much of the rice sold is transferred across the border to Senegal. The ability of contract farming in Jahaly Pacharr to generate rice surpluses for the domestic market is tied to the evolution of three key factors, which are listed below:

- 1) the percentage of the average yield the government calculates for the seasonal loan;
- 2) the use of the investible surplus by project farmers, specifically whether or not it is reinvested in agriculture, which will be key to sustaining high yields;

3) the political ability of the state to enforce loan repayment and production guidelines. A push by the state to evict farmers, especially those who are politically elite may jeopardize the basis needed to mobilize and legitimize popular support for future projects. If the project's plots are not used productively, the ability of Jahaly Pacharr to deliver its technological promise will be seriously constrained.

The manner in which these relationships evolve is critical to the ability of The Gambia to solve its agrarian crisis. It is also key to the type of transformation that will occur in peasant agricultural production.

CONCLUSION

This review of irrigated rice production in the Jahaly Pacharr project has raised a number of research questions of relevance to studies on contract farming. The main theoretical and policy implications of the Gambian case study are summarized in this section.

Most studies of contract farming in Africa have focused on projects that are based on traditional tropical cash crops like palm oil, sugar, tea, and coffee. There is good reason for this. Few contract farming schemes have involved food-crop production, which has been attributed to the fact that subsistence crops are often price controlled due to the cheap food policies of many African governments (Glover 1983). Contract farming in food staple production in The Gambia suggests, however, that this thesis needs to be reevaluated.

An IMF-induced economic recovery program has brought an end to cheap food policies in The Gambia, (21) but it is important to note that contract farming was planned and initiated years before the policy change. Moreover, as the historical review of contract farming demonstrates, its implementation in Jahaly Pacharr has its origins in the CDC's Gambia Rice Farm in the 1950's. Thus, contract farming in food-crop production is not new to The Gambia. What is new is its successful implementation.

A major contention of this study is that contract farming in The Gambia has to be understood in the matrix of the nation's agrarian dilemma--specifically, the country's dependence on one export crop to finance milled rice imports. The key objective long characterizing the colonial and post-independence government's agricultural policies has been to transform the smallholder sector to provide both export and food-crop surpluses (Carney 1986). While export production has stagnated in the last decade (Table 9), dependence on food imports has climbed so that half the country's annual needs are now supplied externally. The

implementation of contract farming projects based on the dietary staple, rice, must be understood in this context.

Another advantage to the contract farming of rice is that the promise of subsistence security has minimized producer resistance to the new production relations. The promise of food security has been important in fostering the state's overall objective to implement double cropping in the farming system and to expand commodity production to lowland ecological zones. In this context, then, the main issue in Jahaly Pacharr is not i) whether the project is significantly reducing import-substitution, or ii) its development costs per hectare compared to alternative schemes, (22) but its ability to transform the labor process of smallholders.

In addition to the role of contract farming in transforming smallholder agricultural production, this research also raises some issues of theoretical interest to household and gender studies. The Jahaly Pacharr project was specifically designed around the availability of family labor. As we have seen, the Green Revolution technological package and the new production relations introduced in Jahaly Pacharr have demanded an intensification of this labor. The external pressure placed on the production unit in the farming system has initiated major changes in household production dynamics. Of theoretical value is the manner in which the need to mobilize labor for the new production package has led to internal changes in the farming system and in resource rights at the level of the household.

Research attention has already been directed to the differential benefits that may accrue to certain household members through a restriction of other members' access to productive resources (Folbre 1986). While this development is sometimes cast in the context of economic or political struggles (see Folbre 1986; Richards 1986), the study argues that it may be one of the few options available to farm units that must intensify their work regime but operate with limited financial resources in labor-short agricultural contexts. Thus, the need to mobilize labor for introduced technological processes may lead to a limitation of resource rights within the farm unit.

A second and related concern is the manner in which such internal adjustments in the household may adversely affect the land and/or crop rights of dependent family members. This is most clearly illustrated with the Mandinka, who responded to an earlier phase of commercial agriculture by restricting female access to upland groundnut farms. Since the 1950's, conflicts over Mandinka women's rights to individual rice farms have been reported in many Gambian rice projects, even though historical evidence from the early eighteenth century suggests that women have long enjoyed rights to individual fields in exchange for labor on household food farms (Carney 1986). The attempts by

male household heads to claim female labor for two cropping seasons and the failure among many Mandinka households to honor women's crop rights are not only a major structural break in some of the farming system's fundamental principles, but also demonstrate the dynamic processes conditioning resource use. Moreover, the claim in the Jahaly Pacharr project area that irrigated rice land belongs to elder males (through the designation of household land), illustrates the manner in which the outcome of resource struggles can be legitimized by invoking "tradition." This study shows that "tradition" is constantly being redefined in the wake of inter- and intra-household struggles over productive resources (see Hobsbawn and Ranger 1983).

Finally, research in Jahaly Pacharr indicates that major changes in customary tenure systems can take place without nationalizing or privatizing the land. While the project operates on the less politically-sensitive basis of a lease, future plans to consolidate the small-scale irrigation perimeters do not even call for a lease. This will not be necessary because land usufruct will be dependent on one factor--repayment of the seasonal loan credit. The Gambian government has already offered the rationale for this policy change by arguing that "developed" land belongs to the nation and cannot be unproductively used. In the future, irrespective of type of land ownership, access to productive resources will depend not on custom but on the ability to fulfill credit guidelines.

NOTES

1. For a more complete discussion of customary tenure, individual crop rights, and labor obligations, see Carney 1986, Chapter 6.
2. US \$16.5 million, one-third of which is funded by the International Fund for Agricultural Development (IFAD), the remainder provided by the African Development Fund (ADF), the World Food Program (WFP) and the governments of the Netherlands and West Germany. See Appendix 1 for funding structure and loan terms.
3. Gambia population 1983 census: 695,000.
4. In 1980 per capita rural incomes averaged about US \$130 in the area.
5. Fieldwork interviews.
6. Other villages are Fula and Wolof.

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7. For a more complete discussion of the impact of the land allocation on gender and socioeconomic rank, see Carney 1986, Chapter 7.
 8. Notably Brikama Ba and Saruja near Jahaly swamp and the Sapu agricultural station.
 9. See Carney 1986 for a fuller discussion.
- 980). The Jaha
10. This was clearly brought out in a recent court case in Pacharr, a Mandinka village. A man divorced his wife and tried to take away her use of the tidal plot. The woman, aware of the original project decision, which stated that plot usufruct could be retained with continued village residence, decided to contest his action. In this case she had the backing of agricultural extension agents who claimed she did all the labor. The matter was adjudicated in a meeting with the district commissioner, chief, and land allocation members. They decided that since the man had a pumped plot and since it was he who divorced his wife, as long as she maintained village residence, she could farm it. Ultimately, though, the plot belongs to the household, and its use and access will depend on the male household head.
 11. Most of the discussion in this section applies to Mandinka households in Jahaly, not Pacharr, swamp. Jahaly swamp has a larger pump-irrigation area (440 hectares compared to 90 hectares in Pacharr) and consequently more households with pump-irrigated land. Pacharr swamp had fewer cases of multiple plot ownership by one family as well as few cases of new tillers being given pumped land, two factors affecting labor availability in Jahaly swamp.
 12. Information gathered in village interviews.
 13. Seni Dabo, Jahaly Pacharr project manager in the BBC's "The Lost Harvest," 1983.
 14. BBC Global Report, *ibid.*
 15. Brikama N'Ding.
 16. This discussion is based on ideas from Friedmann, 1979.
 17. Primarily from Mali, Guinea, Senegal, and Guinea Bissau.
 18. From western Gambia a Jola subgroup known as Karoninkas who began to rent small-scale irrigation perimeters during their seasonal treks for palm wine tapping.

19. In fact, the Jahaly Pacharr project is one of the main core support areas for the ruling political party.

20. This contention shows an ignorance of key principles conditioning upland agricultural practices in the farming system, which, among other things, involved: intercropping cereals; rotating land use between agricultural, pastoral, and fallow cycles, and changing crop sequences on one plot. Groundnut cultivation has historically been accompanied by deforestation and soil erosion due to the planting of monocropped stands and the practice of burning off the residues after harvest. Thus, while groundnuts add nitrogen to the soil, their value cannot be assessed without a relationship to the overall land use system.

22. The program began in 1985, the second year of the Jahaly Pacharr project, and involves three components: i) devaluation of the dalasi; 2) the dismissal of 25 percent of the country's civil servants and a hiring freeze on government positions; and 3) marketing reforms, which have: i) dismantled the monopoly of parastatals and ii) tied domestic consumer food prices to world market values.

23. Comparative costs per hectare (in dalasis) are available for three types of rice development programs: improved tidal rice (D 2000); small-scale irrigated perimeters (D 7500); and Jahaly Pacharr (D 25,000) in Garney, 1986.

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APPENDIX 4. FUNDING STRUCTURE OF THE JOHALY FERTILIZER PROJECT 14

<u>Recipient</u>	The Republic of Ghana
<u>Executive Agency</u>	The Ministry of Agriculture and National Resources (MANR)
<u>Total Project Cost</u>	US \$ 16.53 million
<u>Amount of IDA Financing</u>	US \$5.02 million
<u>Terms of IDA Loan</u>	50 years including a grace period of 10 years with a service charge of 1 percent per annum

Lenders

	<u>Amount</u> (US \$ million)	<u>Terms</u>
African Development Fund (ADF)	4.77	Standard ADF Terms (1)
The Federal Republic of Germany	2.60	Grant
The Kingdom of the Netherlands	2.10	Grant
World Food Programme (WFP)	0.44	Grant

Contribution of the Recipient US \$ 1.0 million

Appraising/Cooperating Institution African Development Bank (AfDB)

* Project implementation period: 5 years, 1982-1987

(1) Fifty (50) years including a grace period of ten years with a service charge of 0.75 percent per annum on amounts disbursed and outstanding. Repayment of 1 percent per annum from the eleventh to twentieth year inclusive and 3 percent thereafter.

Figure 2. Explanatory

FUNCTIONS AND OBJECTIVES

1. Project Coordinating Committee
Comprised of high Gambian government officials
Tasks:
a) coordinates project budgetary issues
b) integrates project with national agricultural plans and relevant ministries
2. Project Management Unit
 - a) Extension and Training
 - training of extension staff in farming techniques, water management, etc., for dissemination to farmers
 - b) Irrigation Department in charge of:
 - land development in project
 - pumping schedule
 - development of infrastructure for water delivery and gate operation
 - repair and supervision of irrigation infrastructure
 - c) Accounting and Administration Department
 - preparation of accounts for each Jahaly-Bachary donor
 - advises IFAB/project management on changes for production package
 - analyzes and controls project fund disbursement
 - d) Mechanization Department
 - maintains and repairs project equipment
 - organizes supply of spare parts and fuel delivery
 - e) Credit and Marketing Unit/Gambia Cooperative Union
 - handles repayment of loan credit by farmers
 - supplies farming inputs: seeds, fertilizers, rice sacks
 - offers loans for production inputs such as water carts, rice threshers, sickles, and knives
 - provides storage and handling facilities for paddy rice
 - markets the paddy to government parastatal, Gambia Produce Marketing Board
3. Land Distribution Committee
The Land Distribution Committee (through the two swamp allocation committees) is the only institutional structure that links the project management to farmers

Composition: District chief, key village headmen, and representatives of prominent farm families locally, as well as the elected members of the two Land Allocation Committees.

Deeds:

-The organization of the distribution of plots in the project

-an intermediary between the project and farmers to explain procedures and management's objectives

-presents farmers' complaints to project management

-the Committee has the final responsibility to handle land usufruct disputes

-since Land Allocation Committees in villages are unable to remove a farmer from project land, the matter will be resolved by the Committee.

a) Land Allocation Committees:

Composition: Jahaly swamp (13 members: 7 women and 6 men); Pacharr swamp (15 members: 8 women and 7 men)

Duties:

-Committee members in each swamp were directly in charge of the original and future land distributions

-Problems in land use or farming operations are transmitted by the members to project management

-Committee members explain changes in cropping or project procedures to farmers

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APPENDIX III

WORLD FOOD PROGRAM RICE DELIVERIES TO JANHALY BACHARR PROJECT

From November 1983 to November 1984:

Milled Rice Deliveries	Purpose
832 tons	crop compensation
289 tons	Food for work (canal and bund construction)
500 tons	Food for work (canal and bund construction)

Source: UNDP, Banjul 1984

Questionnaire:

Forms of Labour Uses
Wet Season 1986

Farming Systems Unit
Jahaly Pacharr Project

Village: _____

1. Name of Compound Head: _____

2. Composition of Compound Members (specify only members permanently working and living in the compound now)

	MALE	FEMALE	CHILDREN
a) Family Members	_____	_____	_____
b) Strange Farmers	_____	_____	_____
c) Koranic Students	_____	_____	_____
d) Other Non-Family Members	_____	_____	_____

Specify which type: _____

3. Number of Pump-Irrigated Plots in Jahaly-Pacharr: _____

4. Principal Farmer: Plot #1: _____

Codes for Payment: Male _____ Female _____

- C=cash
- P=paddy
- U=unpaid

MANUAL LAND PREPARATION	MURSEY PREPARATION	TRANSPLANTING	WEEDING #1	WEEDING #2	WEEDING #3	HARVESTING	THRASHING	TRANSPORT TO CO-OP	SELLING RICE
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5. Labour Type	MANUAL LAND PREPARATION	MURSEY PREPARATION	TRANSPLANTING	WEEDING #1	WEEDING #2	WEEDING #3	HARVESTING	THRASHING	TRANSPORT TO CO-OP	SELLING RICE
a) Family Male										
b) Family Female										
c) Kafo Male										
d) Kafo Female										
e) Day Labour Male										
f) Day Labour Female										
g) Women's Rice Company										
h) Strange Farmer										
i) Taliba										
j) Vortex Thresher										
6. Amount of Payment	MANUAL LAND PREPARATION	MURSEY PREPARATION	TRANSPLANTING	WEEDING #1	WEEDING #2	WEEDING #3	HARVESTING	THRASHING	TRANSPORT TO CO-OP	SELLING RICE
a) Dalasis Family Labour										
b) Paddy family Labour										
c) Dalasis Kafo										
d) Paddy Kafo										
e) Dalasis Day Labour Male										
f) Paddy Day Labour Male										
g) Dalasis Day Labour Female										
h) Paddy Day Labour Female										
i) Dalasis Rice Company										
j) Paddy Rice Company										
k) Exchange for Room and Food										

f) specify c=cups or b=bags

APPENDIX V

Fiscal year: 1 July to 30 June, 1986

Area: 10,300 sq. km

Population: 695,000 (1983)

Growth rate (1974-1984) 3.5 %
urban 6.5 %

rural pop: 77 %

Adult Literacy: 19 %

Currency Equivalents (Dec. 1986): 1 dalasi = 0.14;
US \$1.00 = 7.4 dalasis

Domestic Exports (Feb) 1984

	(dalasis million)
Groundnuts (shelled)	39.4
Groundnut oil	44.6
Groundnut meal	3.9
Fish and fish products	3.6

	94.5
Re-exports	63.2

Imports (cif) 1984

Food and Beverages	153.7
Manufactured Goods	56.9
Machinery and Equipment	60.7
Mineral Fuels	43.7

	354.2

Macro-Economic Indicators

	1981	1982	1983	1984
GDP Dalasis million	491.4	594.4	614.6	625.1
Real GDP Growth	3.0	9.8	-10.0	-2.0

Average per capita income: US \$260.

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APPENDIX VI

INSTITUTIONS/PERSONS CONTACTED

Dakar

1. David Hunsberger - USAID
2. Jim Webb - US AID/CRMS
3. William Duggan - Ford Foundation

Banjul

1. Mees Van Kampen - Ministry of Water Resources and Environment
2. Lion Gilbert - Gambia Agriculture and Research Diversification (GARD) project
3. Christine Elias - GARD water resources specialist
4. Josh Posner - GARD agronomist
5. Tom Holgood - USAID assistant agricultural officer
6. Ralph Conley - USAID agricultural program director
7. Tom Herlihy - USAID
8. Mohammed Usman - World Bank consultant, PPMU
9. Baboucar Bai - PPMU Statistics Division
10. Suruwa Jaiten - Freedom From Hunger Campaign
11. Dr. Anthony Wilkins - Medical Research Council schistosomiasis study

Sapu Agricultural Station

1. Margo Kooyma - EURDCONSULT agronomist/farming systems specialist
2. Willie Van Kampen - Jahaly Pacharr agronomist
3. Seri Dabo - Jahaly Pacharr project manager
4. Sanneh Jatta - Jahaly Pacharr assistant project manager
5. Eliman Ndow - Jahaly Pacharr/Gambia Cooperative Union liaison officer
6. Omar Jannah - Madina Cooperative director
7. Daddy Dampha - Pacharr Cooperative director
8. Modi Sanneh - Weilingara farmer
9. Sulay Njie - Jahaly Pacharr agricultural assistant
10. Kebba Touray - PPMU enumerator
11. Fatou Barr - fieldwork enumerator
12. Momodou Balajo - fieldwork enumerator
13. Laura Erikson - Peace Corps volunteer, Kerewan Samba Bira
14. Glen Lanham - Peace Corps volunteer, Saraja
15. K. S. Demba - Agricultural superintendent on rice, Sapu Agricultural station

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