Agricultural Change Among the Alto Mayo Aguaruna, Eastern Peru: the Effects on Culture and Environment.

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AGRICULTURAL CHANGE AMONG THE ALTO MAYO AGUARUNA, EASTERN PERU: THE EFFECTS ON CULTURE AND ENVIRONMENT

A Dissertation

Submitted to the Graduate Faculty of the Louisiana State University and Agricultural and Mechanical College in partial fulfillment of the requirements for the degree of Doctor of Philosophy

in

Geography

by Martha Adrienne Teresa Works
B. A., University of the Americas, 1974
M. A., Arizona State University, 1980
December 1984
A long-standing interest in the peoples and environments of Latin America lies behind this dissertation. After spending several years in Mexico, my initial exposure to South America in 1975 served to heighten my interest and awareness of cultures and areas undergoing incorporation into the modern world. I returned to Perú in 1980 to conduct field work for my Master’s thesis on agricultural development in the Central Huallaga Valley and at that time I visited the nearby Alto Mayo Valley. During a subsequent trip in 1981 to eastern Peru and the Alto Mayo Valley, Lincoln Villanueva Carbajal, then director of the Alto Mayo Project in Moyobamba, first brought to my attention the presence in the valley of Aguaruna Indians. Brief observation during visits to Aguaruna settlements on that trip sharpened my focus on the transformations that both culture and environment experience with the advent of new agricultural systems and economic development. The Aguaruna of the Alto Mayo Valley were to become the subject of those concerns in fieldwork conducted over thirteen months in 1982 and 1983, and that fieldwork is the basis for this dissertation.

Approximately 1500 Mayo Aguaruna occupy the hills surrounding the Alto Mayo Valley. They have remained relatively isolated and outside the national economy until the early 1970s when roads, colonists, and bilingual instructors began to make inroads on Aguaruna
land and life. Change has come rapidly. Aguaruna swidden practices are being replaced by commercial rice cultivation and the society is rapidly being incorporated into the national economy and culture. Economic change, or development, is still imperfectly understood, but even less well understood and studied are transformations that economic change brings about in the cultural patterns and physical environment.

Most of my fieldwork was spent in Bajo Naranjillo, the most acculturated of the nine Aguaruna communities holding land titles from the Peruvian government. It is also the community that by acceptance of commercial rice cultivation has most connections with the national economy. Thus, it has moved further from a traditional subsistence economy than have the others. To gain familiarity with the more traditional aspects of Aguaruna economy, I conducted fieldwork in the Shimpiyacu and Dorado communities and visited several others. Work among these more traditional communities provided a baseline of data and observation for assessing the direction and rate of change of more progressive communities, such as Bajo Naranjillo.

Foreign fieldwork and its insights are not possible without the help of many institutions and individuals. I thank the Fulbright program for a grant that enabled the thirteen months of fieldwork. An award from the Robert C. West Field Work Fund from the Department of Geography and Anthropology of Louisiana State University made possible an earlier trip to Peru in May and June of 1981. At that time I first made contact with the Aguaruna and began to formulate
my ideas on agricultural change as a research topic.

I owe the greatest thanks to the Aguaruna of the Alto Mayo Valley, especially to the people of Bajo Naranjillo, Shimpiyacu, and Dorado, for their patience and tolerance of the gringa's incessant questions. Particularly I thank the individuals whose hospitality and friendship made the fieldwork for this project both interesting and enjoyable. In Bajo Naranjillo Samuel Bazan Paz and his wife "Nueche" always welcomed me in their home where I spent many evenings listening to stories and learning from them. Pablo and Anita Bazan of Shimpiyacu contributed greatly to my understanding of tradition and change. Noe Cahuaza Neashampi, President of the Organizacion Aguaruna Alto Mayo, spent many hours talking about changes among the Aguaruna and about Aguaruna history in the valley. Tito Ikam Jiakan (Shimpiyacu), Celestina and Adolfo Juip Nampin (Bajo Naranjillo), and Adriano Danducho Chimpa (Dorado) all offered valuable time and assistance. These people significantly contributed to this dissertation. I thank them all.

Several friends and colleagues in Moyobamba, Perú, contributed to this project. Ada Ocampa and Emigdio Soto, sociologists with the Proyecto Especial Alto Mayo, and Jose Luis Portocarrera, anthropologist for the Moyobamba office of the Instituto Nacional de Planificacion, provided maps, documents, information, and discussion that amplified my understanding of the Aguaruna and of the Alto Mayo Valley.

The director and staff of the Fulbright Commission in Lima provided a welcome base. Director Marcia Koth de Paredes, Assistant
Director Mariana Pease, and the entire staff were helpful and instrumental in establishing a supportive environment for my fieldwork in Peru.

I was affiliated with the Centro Amazónico de Antropología y Aplicación Práctica in Lima during 1982-1983. I would particularly like to thank Father Jaime Regan and Alejandro Camino for making available the facilities of the center and for offering welcome advice about my research.

My sincere thanks goes to Michael Brown of the Department of Anthropology, Williams College. His work on the Mayo Aguaruna, and correspondence with Dr. Brown over the past few years, greatly contributed to my understanding of Aguaruna life and culture.

An expression of appreciation is due the Department of Geography and Anthropology at LSU and the members of my committee. Donald Vermeer, my major professor, provided invaluable advice and support during the planning, fieldwork, and writing of this thesis. His patience and persistence in reading several drafts of my dissertation are evidence of his goodwill and his dedication to graduate research. I offer, as a measure of my respect and gratitude, the hope that my future contributions to geographical research will reflect his teachings and scholarship. William Davidson first encouraged me to attend LSU and his enthusiasm for Latin America is a constant source of inspiration. The opportunity to study with Herman Daly was one of the rewarding facets of my graduate study. Much of the opening chapter derives from books and ideas that were introduced in his classes. Conversations with Nigel Allan broadened
my understanding of culture and environment in the Middle East and Asia; Miles Richardson's research on culture and place has influenced much of my thinking about change and adaptation among the Aguaruna.

I would like to thank Paul Hribernick and David Nugent, whose friendship and good humor relieved some of the tedium of extended field work abroad. And finally, I want to dedicate this dissertation to Paul Hribernick and to my mother, Inell Mire Works LeBlanc.
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LIST OF ABBREVIATIONS

cm centimeter
ha hectare
kg kilogram
m meter
mm millimeter
mt metric ton
S/ sol, Peruvian currency
### LIST OF ACRONYMS

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<tr>
<td>BAP</td>
<td>Banco Agrario del Perú</td>
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<td>CAH</td>
<td>Consejo Aguaruna-Huambisa</td>
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<tr>
<td>CIPA</td>
<td>Centro de Investigación y Promoción Agropecuario</td>
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<td>CODESAM</td>
<td>Comité Departamental de Desarrollo de San Martín</td>
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<td>ECASA</td>
<td>Empresa Comercializadora de Arroz y de Servicios Agropecuarios</td>
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<td>Instituto Geográfico Nacional</td>
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<td>MinAg</td>
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<td>OAAM</td>
<td>Organización Aguaruna Alto Mayo</td>
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<td>OCAAM</td>
<td>Organización Central Aguaruna del Alto Maranon</td>
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<td>ONERN</td>
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The Aguaruna Indians of the Alto Mayo Valley of tropical eastern Peru are experiencing economic change as Spanish speaking colonists from the temperate highlands immigrate and begin intensive rice cultivation. The Aguaruna, subsisting until recently on hunting, gathering, and horticulture, are now being exposed to dramatically different ideas about land, agriculture, and technology.

Economic change, as expressed by modification of agricultural patterns, reflects an area of close interaction between man and the environment. With the acceptance of rice cultivation among some Aguaruna in the Alto Mayo Valley a marked departure from traditional agricultural patterns has begun to emerge. Increased forest clearing, reorientation toward land as a resource, new roles for men and women in agriculture, a centralized settlement pattern, and change in community relations are manifestations of the transition to commercial agriculture. Agricultural change among the Mayo Aguaruna offers insight into how subsistence groups adjust to change in their economic world.

The Aguaruna have moved from a relatively secure and sufficient subsistence economy to a production system dependent on the vagaries of unstable national and international economies. The effort of extracting an increasing amount from the physical environment, beyond subsistence needs, produces a variety of changes in the
Aguaruna world. In everyday experience economic change involves modification of the Aguaruna relationship to the natural, built, and social environment. Adaptation to changes in agricultural activity demands new types of information, and traditional knowledge systems are replaced with the information necessary successfully to manage a new system of environmental exploitation. A more complex social organization and changes in material culture further indicate the reorientation from subsistence to commercial production. The complex of processes, associated with economic development and triggered by the move to cultivate commercial rice, is clearly reflected in modification of the culture and custom of the Aguaruna.
INTRODUCTION

The Aguaruna Indians of the Alto Mayo Valley of tropical eastern Perú are experiencing economic change stimulated by immigrants from the temperate highlands who have begun intensive rice cultivation. The Aguaruna, subsisting until recently on hunting, gathering, and horticulture, are now exposed to dramatically different ideas about land, agriculture, and technology.

This study focuses on agricultural change among the Aguaruna. It addresses questions about the meaning of economic development and about the cultural framework in which agricultural development and economic change take place. What are the relationships among environment, economics, and culture? How is economic change reflected in Aguaruna cultural institutions, in use of the environment, and in the landscape? Agricultural change is but a part of economic development, yet it reflects an area of close interaction between man and the environment. The study considers how the internal dynamics of a cultural system reflect economic development and agricultural change. It analyzes the events of development as manifest in the changing relationship of the Aguaruna to their natural, built, and social environment.
The Concept of Development

Development is generally understood to mean change that seeks an improvement in the quality of life on a national or regional scale. While economic development may be represented by an improvement in levels of education or health, it is usually indexed by economic data such as increased production or more equitable distribution of goods. In the case of agricultural development one or a combination of the factors of production must intensify in order to increase production; change in intensity of land use, in labor, or in capital inputs has an effect on the agricultural process. Thereby agriculture, the most fundamental economic activity of man since plants and animals were domesticated, becomes an essential link in the web of modernization, and it has implications for both economic and cultural development.

An understanding of economic development becomes significantly more complex if it entails an attempt to assess accelerated cultural modification. The rate of cultural modification significantly increases when development involves importation of technology vastly different from one's own. Thus, when subsistence agriculturalists and hunters and gatherers, such as the Mayo Aguaruna, are confronted with social, political, and economic institutions vastly different from their own, change is inevitable and abrupt.

Change in overall orientation toward the environment necessarily follows from a change in economic systems. The transition from swidden cultivation to irrigated, monocultural agriculture is accompanied by a transition in social and cultural structure as
well as changes in the physical and built environment: changes which represent the effort to increase production and result in increasing involvement with markets, ideas, and products outside of the immediate area.

The process of change is a manifestation of the growing interdependence of the world community. The last vestiges of discrete and self-sufficient cultural systems disappear as a linked world agricultural system evolves. The trend is toward interdependent cultures producing goods for consumption beyond the immediate area of production.

Adaptation and change are implicit in the process of economic development. Change is manifest in the transformation of the physical environment as well as in the transformation of cultural values, material culture, and symbolic structure of the everyday world. Observation and analysis of change in traditional patterns of life and livelihood as people undergo economic development may lead to an understanding of processes operative in adaptation under changing economic circumstances.

Economics, Ecology, and Development

The classical notion of the economic process implies change, or development. The concept of ecology, a word first used by the biologist Haeckel (1876) to explain the relationship among organisms living within a defined space, itself involves the idea of process or change. Neither economic systems nor ecological systems are static; both deal with flows of energy and
matter. Biophysical ecosystems, as modeled by ecologists, deal with the ebb and flow of organisms and pure matter as they are fueled by solar energy. Economics introduces the notion of human activity. Man shapes matter and directs energy conversion in a continuing effort to maximize comfort and maintain a certain level of sustenance.

An ecosystem can function independent of the economic system, but the opposite is not the case. As economies "develop" they become increasingly dependent upon the ecosystem to provide matter and energy for the increasing demands of good and services. When a population approaches the limits of its natural carrying capacity, the environment of an ecosystem experiences pressure and reduction of its resources. An increase in the flow of products and services cannot occur without increasing extractive demands on the environment. Thus, the spheres of ecology and economics overlap in the environment.

Wellbeing in an ecological system depends on the maintenance of a constant rate of flow of matter and energy. Variations in rates of flow result largely from external influences which affect the conditions of flowthrough. Economic systems also depend on a flow of inputs and outputs. Increasing economic activity, or economic development, requires increased inputs of energy and resources, and thereby implies an impact on the ecosystem.

A relatively stable relationship between the environment and an economic system occurs when lifestyles interact closely with the environment. Subsistence economic systems tend to exploit the environment at rates that assure a long term supply of the
resources on which they depend. Once out of the subsistence realm, when production is geared for consumption outside of the immediate society, demands on the ecosystem increase because of accelerated economic activity and the introduction of new technology. The process of economic development, or the increasingly intensive use of resources, thus encompasses the connections between culture, environment, and economics. With the advent of economic change both the cultural and environmental, or ecosystemic, components experience change. Man interacts with the environment in a variety of economic systems. Each system combines different cultural and economic patterns to derive benefit from the environment and all undergo continuous change with development.

**Cultural Ecology and Economic Development**

The concept of cultural ecology encompasses the relationship of man to the environment. In use of the physical environment man must constantly make adjustments to altered conditions derived from the human and natural realms. Cultural ecology thus encompasses dynamism born from natural as well as cultural systems; the environment and the realm of human ideas are all subject to subtle, but nevertheless ongoing, alteration.

All economic activity modifies the environment to a certain extent. When man as the hunter-gatherer selectively culls species from the natural environment those activities leave marks on the landscape. And as agricultural systems evolve, the degree of intervention with the physical world increases. The level of
interaction of man's agricultural systems with the environment ranges from the near replication of the structure of the tropical forest in mixed cropping swidden systems to the dramatic reshaping of the landscape under sophisticated irrigated terrace farming (Geertz 1971). As human economy makes the transition from hunting and gathering to agriculture and eventually to industrialization, the level of interaction with the ecosystem constantly increases. The allocation of scarce resources for competing ends shifts as culturally defined desires and culturally defined means of exploitation change.

Cultural ecological studies have most often concentrated on pre-agricultural or agricultural societies and the effects of agricultural intensification on the ecology and economics of a group. It is possible today to observe, in a relatively short time, the cultural and economic transformation of societies as they become incorporated into the world market economy. Such transformations provide a setting for documentation of the dynamics in cultural, ecologic, and economic systems.

Traditional agricultural systems represent long term ecological and economic adaptations. Commercial agriculture, on the other hand, accelerates production, either by increasing inputs of labor or capital, or by extending the area under cultivation. Such agricultural systems serve the ends of wealth accumulation and problems resulting from rapid population increase, but they are often maladaptive; they do not attain long term equilibrium between their economic function and their relationship to the
ecosystem (Nietschmann 1973; Grossman 1981). Economic stimuli, without corresponding ecologic considerations, often result in deleterious effects to land, culture, and economy. As Bartlett (1980: 5-6) states, "the transition from 'traditional' to more 'developed' economies is a transition to a different framework for decision making, one which may or may not be adapted to survival in bad years, but rather to profit maximization in average years".

John Bennett (1976) labels the process of economic development the "ecological transition", thereby underscoring the increasing incorporation of nature into human purpose and action. Cultural evolution and the advancement of economic systems increase the amount of resources derived from the biotic and mineral realms. Economic development, through a series of cultural adaptations, increases service and productivity to mankind, although certainly at a cost.

The reasons for intensification of agricultural activity and environmental exploitation are complex. Boserup (1965) considers agricultural intensification a response to population pressure. Following up on Boserup's thesis, Wilkinson (1973) writes that economic development and technological innovation are a response to resource scarcity. As a given resource is depleted people seek substitutes, the extraction of which usually entails more intensive exploitation of the environment. Technological, social, and political changes accompany a shift in the resource base. Technological innovation and population pressure are synergistic
and difficult to analyze as separate factors of economic change. The effect of either, however, is a more intensive interaction with the natural environment. Man increasingly fashions things of economic and symbolic value from the matter and energy of the physical world and incorporates them into his cultural realm.

In a contemporary industrial setting the proliferation of objects that result from cultural evolution and economic development serve to distance us from the natural environment. The complexity of our interaction with the biophysical world makes it difficult to consider a study of contemporary society in the framework of cultural ecology. Among less sophisticated technologic societies, however, the magnitude of baseline economic activity becomes comprehensible, and the potential environmental change more apparent, thus making it possible to glimpse the process of cultural adaptation. When economic development is imposed from without, the evolutionary progression of the indigenous economy is arrested and displayed alongside the exotic economy, thereby reflecting the contrast of cultures and economies.

Cultural, Ecologic, and Economic Change as Processes of Development

The concepts of economic development and cultural ecology provide an effective framework for understanding the situation of the Aguaruna in the Alto Mayo Valley. Instead of slowly evolving adaptations over a long time, the Aguaruna are moving relatively quickly from traditional systems to the technological age of the
world economy. Because the Aguaruna are experiencing abrupt economic change, their situation offers the opportunity to witness economic development as a process. Cultural ecology relates to economic development in that it deals with adaptation and change, emphasizing the relationship between man and the environment. This study combines ideas on cultural and economic development in a description of agricultural change, thereby making a statement about cultural and economic development among peoples living largely near the subsistence level.

Aguaruna agricultural change and intensification do not stem from internal factors such as population pressure as Boserup has suggested (1965). Rather, the Aguaruna transition from subsistence to commercial production arises from external economic factors attributable to population and food supply problems in other regions of Peru. Similar external stimuli for change have been noted by Geertz (1971) and Hanks (1972) in Southeast Asia. More recently Grossman (1981) and Gudeman (1978) have identified related causes of economic change in New Guinea and Panama.

Gudeman (1978) calls the transition from subsistence to commercial agriculture one from "production for use" to "production for exchange". Grossman (1981) terms it a transition from "subsistence affluence to subsistence malaise". Both studies suggest the detrimental consequences of cultural change and economic development.

Norgaard (1981) details why development programs in Amazonia have failed to meet with complete success. As technologically
complex agricultural schemes are introduced to an area, the more intensified level of resource exploitation must be followed by an increase in complexity of social organization. Development programs often falter because attendant, essential social structures do not automatically occur in populations whose traditional mode of livelihood is displaced by modern activities such as ranching, mining, and road building. Norgaard maintains that shifting cultivation, and the population density and organization associated with it, coevolved and offer perhaps the best manner of adaptation to the tropical forest biome.

Agricultural development can be thought of as a co-evolutionary process between a social system and an ecosystem. Man's agricultural activities modify the ecosystem while the ecosystem's responses are cause for individual action and social organization. When these sequential adaptations of one system to the other are complementary and beneficial to man, either fortuitously or by design, agricultural development is underway (Norgaard 1981: 238).

The successful longterm adaptation of indigenous groups notwithstanding, recent Amazonian development efforts have had a profound effect both on native groups and the environment. Development enterprises such as cattle ranching (Hecht 1982), oil pipeline roads (Bromley 1972; Hiraoko and Yamamoto 1982), mineral exploitation (Smith 1979; Goodland 1980), and modern commercial agriculture represented by the now defunct Jari enterprise of Daniel Ludwig (McIntyre 1980) have assumed prominence in Amazonia. Literature on the effect of economic change on indigenous groups is often polemic (Stocks 1981; Smith 1983) or consists of ecological analysis of change and adaptation (Ross 1976). Some recent
work in the central selva of Perú, however, does address the integration of social, economic, and cultural factors in mestizo communities and indigenous communities as they become increasingly part of the national and international economic scene (Shoemaker 1981; Chevalier 1982).

While this study focuses on agricultural change, it includes analyses of other accompanying indicators of economic change stemming from agricultural transformation such as settlement patterns, material culture, and social organization. Emphasis on the integrative character of cultural ecology and on the processes associated with economic development provides a framework for understanding agricultural change.

**Economic Development and Processes of Change: The Aguaruna**

The Aguaruna of the Alto Mayo River valley of eastern Perú are simultaneously confronted with the phenomenon of economic development and the need to adjust to conditions posed by outside influence (Figure 1). Traditional Aguaruna culture is adapted to fulfill indigenous social and economic needs within a tropical forest setting. The economic activity now occurring in the Alto Mayo Valley places new demands on Aguaruna society and offers incentives to change. The effort to link native institutions and organizations with those outside Aguaruna society alters the traditional nature of Aguaruna needs and activities. As Peruvians from the highlands move into the Alto Mayo Valley and begin widespread rice cultivation, changes in the Aguaruna world take many forms. Subtle alterations in sub-
Figure 1. Perú and the Alto Mayo Valley. Source: Perú-IGN (1982).
sistence gardens, the need for a new labor system to meet the demands of commercial cultivation, increased areas cleared for rice plots, and confrontation with the technology of large scale cultivation are examples of the repercussions of development in the cultural and physical world of the Aguaruna.

The intricacies of the matrix which define and bind a culture are tied to the economy of the system and to the environment in which daily activities take place. Yet populations which inhabit the same environment can exhibit marked differences in cultural adaptation. Even though some Aguaruna have adopted rice cultivation brought to the Alto Mayo Valley by colonists, striking differences in attitude toward land and agriculture exist between the agricultural migrants and the Aguaruna. These differences occur along an agricultural continuum ranging from traditional Aguaruna subsistence patterns to intensive irrigated rice paddies of the colonists. To what extent have external economic influences changed the way the Aguaruna live in their environment? How have the spatial order and material culture of the Aguaruna changed as a result of external stimuli? And how have economic and ecological change affected social relations within Aguaruna society and with the mestizo world beyond?

The Mayo Aguaruna experience offers insight into how subsistence groups respond to economic change. What does a changing economy mean for the environment? How in turn is a change in the physical environment reflected culturally, socially, and symbolically? What does it mean for day-to-day activities to leave a self-sufficient
system and become part of an interdependent system?

Just as the ecological relationships of complex systems are difficult to dismember, it is no less difficult to describe and explain complex economic systems. Relatively self-contained, subsistence economies, such as the Aguaruna, give some likelihood of gaining a wholistic view of an economy, but even among such groups our understanding is only partial. Many near-subsistence economies are undergoing the impact of modernization, and the Alto Mayo Aguaruna are therefore but a microcosm of the process underway among many groups. It is hoped that insights into the dynamics of change among the Mayo Aguaruna will have use in understanding similar processes and problems among other peoples experiencing accelerated cultural and economic evolution.
THE ALTO MAYO VALLEY: PHYSICAL DESCRIPTION AND SETTLEMENT HISTORY

The Mayo Valley between the sierra and the selva of Perú was long isolated from intensive commercialization. In the last decade, however, the tropical forest once covering the valley floor has been replaced by the manicured landscape of commercial rice cultivation. Immigrants have dramatically changed both the physical environment and cultural and settlement patterns of the valley. Bright green fields now blanket the flat bottomlands of the Mayo Valley, some the pure green of rice leaves on land gently layered and terraced for flowing water, others mottled by remaining trunks of trees. The uniform texture of rice fields contrast with the scattered palms and giant trees silhouetted against blue-green forested hills in the background.

Physical Characteristics

Location

The Mayo River cuts through a broad alluvial valley in the Department of San Martín, Perú (Figure 2). The watershed of the Mayo River forms the northwest boundary of the department. The area of the upper basin, approximately 770,000 hectares (Perú-PEAM
Figure 2. The Alto Mayo Valley. Source: Perú-PEAM (1982b).
1982a), is bounded on the north and east by the Sierra Cahuapanes and on the west by the Cordillera Oriental. The valley lies between 77° and 78° west longitude and 5° and 6° south latitude.

The Mayo River originates in the cloud forest pass at elevations above 3000 meters and it empties into the Huallaga River downstream from the city of Tarapoto at an elevation of about 300 meters. Between 900 and 1500 meters the river valley is generally known as the Alto Mayo or Upper Mayo. The hills flanking the valley reach heights of 2500 to 3000 meters. For the purposes of this study the term Alto Mayo will refer to the basin of the Mayo River to the north and west of Moyobamba. This area includes all of the Aguaruna communities and the most active areas of colonist settlement as well as colonial towns such as Moyobamba, Rioja, and Yuracyacu.

The Alto Mayo Valley lies in the zone known as *selva alta* (high jungle), just below the *ceja de la montaña* or "eyebrow of the mountain". The *selva alta* fringes the tropical forest, at elevations from 500 to 1500 meters, and separates the Andean Escarpment from the Amazonian lowlands. The valley generally has less precipitation and lower temperatures than the lowland farther east.

**Landforms**

The Alto Mayo Valley is an anomalous feature in upper Amazonia. It is a broad, flat lowland or graben between nearly parallel ranges of mountains. The Cordillera Oriental to the southwest, a series of ranges reaching 3000 meters, is the older of the two ranges.
Its surface rocks are crystalized limestone of marine origin and date to the Triassic. The Cordillera Cahuapanes to the northeast is a younger range of consolidated sediments, quartz sand and lutite of Cretaceous age (Perú-CNERN 1982: map 3). The tectonic basin which now holds the Mayo River has filled with Quaternary alluvium extending slightly southeast of the town of Moyobamba, where the two flanking ranges converge to form a narrow pass. Beyond this constriction the Mayo River drops 500 meters in 120 kilometers to join the Huallaga River near Tarapoto.

The physiography and origin of landforms in the Mayo Valley are connected more to the events of the Andean orogeny than to Amazonian features. During the Mesozoic the Amazon Basin was blocked on the eastern margin of the continent by ancient shields of crystalline bedrock. The Andean uplift which occurred during the late Tertiary, caused the formation of a large lake covering what is today considered lowland Amazonia. Lacustrine sediment accumulated to considerable depth before the folded and faulted shields gave way and released the lake waters into the Atlantic Ocean. Rivers draining the recently formed Andean range cut easily into the sediment and formed upland terraces or *tierra firme* of Tertiary lake bed soils and lowland floodplains or *varzea*, with their characteristic backswamps, oxbow lakes, natural levees, and the meander scars (Lathrap 1970; Meggars 1971; Sternberg 1975). The Mayo Valley is a part of the folded and faulted uplands of the main Andean range.

The Mayo River meanders as it courses the flat valley
between Naranjos and Moyobamba. It is navigable upstream from Moyobamba for about a hundred kilometers, beyond which falls and rapids prohibit river transportation. In spite of its sinuous course through the valley the Mayo River has poorly developed meander features. The exposed point bars and lenticular islands characteristic of the larger rivers in lowland Amazonia are not evident on the Mayo River. The river level fluctuates seasonally, with a 7-10 meter drop from high water level during the May through September dry season; however, sufficient rains in the upper watershed enable river transport throughout the year.

Soils

According to an ONERN study of natural resources (Perú-ONERN 1982), two major soil orders occur in the Alto Mayo Valley: Inceptisols and Entisols, both referring to soils of recent origin (Figure 3). Inceptisols usually occur in arctic and subarctic regions, rather than in the tropics, but they are present in areas of recently accumulated alluvium. They are characterized as usually moist, with a pedogenic horizon and with soil textures finer than loamy sand. A lack of distinct pedogenic horizons characterizes the Entisols; they are usually transported soils found in any climate and at any latitude (Strahler 1975).

In the Alto Mayo Valley soils of recent deposition (Entisol, fluvent) line the banks of major rivers. They are considered good agricultural soils despite periodic flooding. Somewhat older alluvium (Inceptisol, tropept) lies between the floodplain and
### SOIL TAXONOMY 1975

<table>
<thead>
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<th>SUBORDER</th>
<th>Map Symbol</th>
<th>Description</th>
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<td>Fluvent</td>
<td><img src="symbol1.png" alt="Fluvent Symbol" /></td>
<td>Floodplain: loam, silt: no soil horizon</td>
</tr>
<tr>
<td></td>
<td>Orthent</td>
<td><img src="symbol2.png" alt="Orthent Symbol" /></td>
<td>Lithic or paralithic contact at shallow depth</td>
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<tr>
<td>Inceptisol</td>
<td>Aqued</td>
<td><img src="symbol3.png" alt="Aqued Symbol" /></td>
<td>Seasonally saturated with water</td>
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<tr>
<td></td>
<td>Tropept</td>
<td><img src="symbol4.png" alt="Tropept Symbol" /></td>
<td>Recent depositional surface, well drained</td>
</tr>
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Figure 3. Soil Map of the Alto Mayo Valley. Source: Perú-ONERN (1982).
the flanking hills. The area is considered good for agriculture because of gentle slope and low risk of flooding. The bulk of new colonist settlement occurs on this soil category. Large expanses of poorly drained soil (Inceptisol, aquept) occur on both sides of the Mayo River. Soils with a shallow depth to consolidated rock (Entisol, orthent) cover the surrounding hills (Perú-ONERN 1982; Soil Survey Staff 1975; Strahler 1975).

Climate

The Alto Mayo Valley falls into an Amazonian climate pattern; its precipitation and temperature regimes are influenced by air masses moving westward over the Amazon basin. The Mayo Valley, practically enclosed by mountains, is high enough to receive precipitation from clouds ascending the eastern slope of the Andes. Convectional clouds and storms account for rains in the dryer months of July and August when the equatorial belt of moist tropical air has moved slightly north of the Equator.

Temperature data available for 1964-1981 from stations in Rioja and Moyobamba record a monthly average temperature of 22.6° C (Figure 4). There is a distinct wet and dry season in the Mayo Valley but average rainfall recorded in July, the dryest month, is at least 70 mm (Figure 4). Total average annual precipitation for the Alto Mayo Valley is 1461.2 mm (Perú-SINAMHI 1982).

Temperatures drop and rainfall increases on the slopes surrounding the valley. Average temperature at the 3000 meter hilltops is estimated at 12° C and precipitation increases to 3200 mm per year.
Figure 4. Average annual temperature and precipitation. Source: Perú-SINAMHI (1982).
Vegetation

The Mayo Valley is part of the complex belt of selva alta vegetation influenced by temperature, precipitation, soils and slope. In the Alto Mayo Valley alone Weberbauer (1936: 73) comments:

About Rioja, Moyobamba, and Tarapoto, where wide, partly swampy plains extend between low mountain ranges, and where the Río Mayo runs toward the Huallaga, there is a complicated alternation of matorral, tropical rain forest, subxerophytic evergreen bushwood, and evergreen grass steppe.

Current descriptions of vegetation in the Alto Mayo Valley, and in the New World tropics generally, rely on Holdridge's Life Zones (Holdridge 1947; Holdridge et al. 1971). Holdridge developed classifications for his life zone associations in Costa Rica, but they were adapted for use in Perú by Tosi (1960).

Five of Holdridge's Life Zones are present in the Alto Mayo Valley (Figure 5). Two of the zones, the montane tropical rain forest and lower montane rain forest, only occur on the ridge tops surrounding the basin. A belt of lower montane wet forest covers the upper reaches of the Cordillera Oriental in the southwest portion of the valley. Premontane wet forest surrounds the valley at 1400 to 1800 meters above sea level. A premontane moist forest formation covers the valley floor. Levee, floodplains, swamps, and the caliche zone (chamizal) between the Tumbaro and Naranjos rivers all create different associations to this forest cover. The chamizal and swamp forest are the most conspicuous variation (Figure 5). An impoverished low forest (average 12 m) of thin trees covers
Figure 5. Vegetation zones in the Alto Mayo Valley. Source: Perú-ONERN (1982).
the hardpan zone northwest of the Tumbaro River. Palms dominate the poorly drained areas of the valley around the mouths of the Romero, Negro, and Avisado rivers; these are areas known locally as *aquajales* because of the proliferation of the palm producing the *aquaje* fruit (*Mauritia flexuosa*).

Much of the Alto Mayo Valley bottom, especially the zone of premontane moist forest, has been cleared for agricultural purposes in the last ten years. A cultivated landscape or secondary regrowth now appears over much of the valley. Approximately 50,000 hectares of the 120,000 hectare valley floor are now cleared or in recent fallow (Perú-ONERN 1982). Fire resistant palms tower over green rice fields or over a scrubby regrowth. Over-irrigation of rice has resulted in soil saturation and salt accumulation, further modifying the color and tone of those plots. By contrast, the traditional Mayo Aguaruna agricultural practices have not yet greatly affected the forest cover.

**Settlement History**

**Indigenous Inhabitants**

It is not clear who occupied the Mayo Valley before the Spanish landed in Tumbes in 1535. Local legend suggests that Muyupampa Indians lived in the valley and that they were affiliated on sometimes friendly, sometimes warlike, terms with the Chachapuyas to the west (Velasquez 1974: 3). Evidence that large conglomerations of pre-Inca tribes occupied the eastern slopes of the Andes remains in the ruins of Cuelap and Pajatén, sites in the present day depart-
ments of San Martín and Amazonas that date to around 1000 A.D. (Doig 1983: 526). Garcilasco de la Vega (1966: 301) writes that the area of the Muyupampas, or Mayorunas as they are later called, was settled by a group of Chancas Indians who fled Inca domination in the century before 1400. Garcilasco (1966: 480) mentions that sometime later, by at least 1447, the Inca Tupac Yupanqui had conquered the northern provinces of Perú, including Chachapoyas, and moved into the Chanca settled Muyupampa territory, finally subjugating them to Inca rule. This group of Inca-dominated Chancas were well adapted to dwelling in the high tropical forest. The Spanish called them Motilones (shaved heads) and today they are still a distinct group of Quechua speakers centered around the lower Mayo valley town of Lamas. Scazzocchio (1978; 1979) offers a conflicting explanation for the presence of Quechua speakers in the Mayo Valley. She maintains that the Lamistas were not migrants from highland Peru, but rather an early reduccion (Spanish organized settlement) of tropical forest Indians who were taught to speak Quechua by the missionaries.

In spite of the interesting ethnohistorical data the story is not complete. Perhaps the fleeing Chancas were later called Muyupampas and allied themselves with the Chachapuyas, rather than that the Muyupampas were the original native inhabitants. Some writers assert that the Mayoruna (in Quechua "men of the river") left the Mayo Valley in the face of the 1447 Inca invasion (Velasquez 1974: 4). Others insist that the Mayoruna abandoned the valley when the Spanish arrived (Figueroa 1904: 88), or that
the Mayoruna lived on the left bank of the Mayo River until the late 1600s when they attacked the chapel of Moyobamba, burned it to the ground and then fled (Izquierdos Rios 1976: 33). Present day Mayoruna live in the Javari River drainage on the border of Perú and Brazil. They are reported as tall people with fair skins and beards, a result either of mixing with deserted crew members of Spanish and Portuguese Amazonian expeditions (Markham 1861: xlv) or of miscegenation with the Spanish prior to leaving the Mayo Valley (Izquierdos Rios 1976: 33). Given the abundance of rivers in Amazonia the name Mayoruna is not evidence of a Mayo Valley origin.

More to the point is that the Spanish seem to have encountered little resistance from Indians when they first entered the Mayo Valley, a fact supporting prior Inca subjugation and an acceptance of interaction with the highlands. While later travelers point out the absence of indigenous groups in the Mayo Valley and that the inhabitants of Moyobamba are primarily 'white' (Raimondi 1863; 1942a; 1942b), they still refer to country dwellers and servants as Indians. Indians were acquired as servants from the area around Jeberos and Cahuapanes to the northeast and from the Huallaga valley, and they were used as cargo bearers on the many trade routes that converged on Moyobamba from the 17th through 19th centuries (Stocks 1981; Scazzocchio 1978). Travelers relate that culture traits common to lowland forest Indians also existed in the upper and lower Mayo valley. Traits such as the blow gun, achiote (Bixa orellana) and huito (Genipa americana)
body paint, and the ubiquitous masato (a fermented manioc drink common in Amazonia) were reported in the 19th and early 20th centuries (Maw 1929; Herndon 1853; Smith and Lowe 1836; Zahm 1912; and Raimondi 1942a, 1942b). In spite of these references to native customs in the Mayo Valley no distinct culture groups inhabited the upper valley during the colonial era. It is likely that the Quechua speakers from Lamas (near Tarapoto) were more widely dispersed from their present lower valley location, probably as far northwest as Rioja and Moyobamba. Intermarriage, however, and the blending of cultural habits blurred early distinctions between mestizos and any true Indians in the Upper Mayo Valley.¹ Since only about 10% of people coming to the New World were women throughout the colonial period, and the vast majority of those females stayed in the capital city of Lima, one can imagine the rapid miscegenation that occurred in a Spanish stronghold such as Moyobamba (Dobyns and Doughty 1976: 73).

Spanish Intrusion

The Spanish entered the Mayo Valley early in conquest history. Alonso de Alvarado and 120 Spanish troops accompanied by Indian porters from the recently founded city of Chachapoyas made their first expedition into the area in 1539. The city of Moyobamba (probably from the Quechua word "Muyupampa" which means "round plain") was founded between 1540 and 1542 (Velasquez 1974). The

¹See Stocks (1981) for a discussion of the problems of defining ethnicity for the acculturated Cocamilla.
city became the staging area for expeditions into the Amazon, including the ill-fated voyage of Pedro de Ursua and Lope de Aguirre in 1560 (Lowry 1952; Simon 1861). Cornejo and Osma (1905) report a population of 25 Spaniards in 1583 in Moyobamba. Moyobamba was well enough known as a Spanish town in the 1500s to warrant a visit in 1583 by the popular (later sainted) Archbishop Toribio de Mogrovejo (Mendiburu 1934: 95).

Probably because of a lack of conspicuous Indian populations in the Mayo valley Moyobamba was not an important mission center in the 17th and 18th centuries, but instead maintained a position as an important center of political and commercial activity from colonial times to the beginning of the twentieth century. Moyobamba was the trading center for the extensive lowland Jesuit missions of Mainas until their expulsion in 1767, and later it was the focus for the less active Franciscan missionaries from Ocopa, near the present day town of Huancayo. Lowland Indians carried oil processed from turtle eggs and manatees, salted fish, wax, and cacao (*Cacao theobroma*) to Moyobamba to trade for cotton string and cloth, tobacco, salt, sugar, fish poisons, as well as imported trinkets that had been carried overland from Pacific coast ports.

**Independence and a Century of Commerce**

The Franciscan priests were never able to revive missionary activity to the level of the Jesuit missions of Mainas. The area of the lower Napo, Marañón, and Amazon river basins, known as Mainas and formerly belonging to Ecuador, gradually fell prey to Portuguese
invasions and disorganization in the later part of the 18th century; it came under Peruvian control as the "Obispado de Mainas" in 1802 (Velasquez 1974: 22). In 1812 Moyobamba became the seat of the religious district of Mainas when the Franciscan friar Rangel could no longer endure the lowland hardships of Jeberos. But by the early 1800s the focus of the zone was on independence and commerce rather than religion. Moyobamba was a royalist holdout. Rangel, the royalist troops, and the crown-appointed governors had to flee downstream via the Amazon River to Europe when the nationalists finally achieved independence in 1824.

In spite of difficult access to Moyobamba, significant commercial activity did reach the area during the 19th century (Figure 6). A common route from Lima took at least a month via Trujillo, Cajamarca, Celendín, and Chachapoyas to Moyobamba. East from Moyobamba no trails suitable for mules existed and all cargo had to be carried by Indian porters. The main routes east were to Balsapuerta by foot (50 kilometers and four days), then by boat to Yurimaguas or on another foot trail to Jéberos. Raimondi specifically comments on the atrocious conditions of this route that was traveled "almost daily" (Raimondi 1942a: 43). The other route was through Jepelacio, Tabalosas, and Tarapoto to Chasuta just above the last set of rapids on the Huallaga River (Figure 6). All these routes remained important avenues of communication until the last half of the 20th century when airplanes and roads began to serve the area.

In spite of the early settlement of the Mayo Valley and its
long history as an important place in Amazonia, settlement remained concentrated in a few towns and haciendas near Moyobamba and Rioja (founded in 1772). Population increased dramatically in the 1800s, from 4536 people in 1814 in the area surrounding Moyobamba to over 20,000 in the 1860s (Cavero 1928: 100,105). In the first decade of the twentieth 20th century emigration to the rubber camps of lowland Amazonia reduced the population to only 7000 inhabitants in the Province of Moyobamba (Cavero 1928: 106).

During the early part of the 1900s the Alto Mayo Valley
slipped into relative obscurity. Throughout the post conquest history all activity was concentrated along the paths and centers of trade; the upper reaches of the valley remained uninhabited. New routes through the upper basin were not explored until plans were proposed in the 1950s for a road through the area. The eventual opening of the road in 1977 began another era in the history of the Mayo Valley.
II

THE AGUARUNA: BACKGROUND AND TRADITIONAL LIFE

The approximately 1500 Aguaruna of the Alto Mayo River Valley are part of a larger group of Aguaruna, most of whom live along the sides of the Marañón River in the Department of Amazonas (Figure 7).¹ The Aguaruna are dispersed chiefly along major tributaries of the upper Marañón River such as the Chiriaco, Cenepa, Nieva, and Santiago rivers, although they extend as far as the Cahuapanes region of Loreto. The total population of Aguaruna, one of the largest native groups of the Peruvian lowlands, numbers approximately 20,000 (Uriarte 1977; Vega 1982).

The Aguaruna are one of four tribes comprising, along with the Huambisa and Achual of northern Peru and Jívaro proper or Shuar of Ecuador, the Jivaruan language family (Figure 7).² The Jivaroans live in the uplands of western Amazonia and subsist on hunting, gathering, and agriculture for their livelihood. While they have fought among themselves and rebelled against outsiders, they recognize

¹In this chapter "Aguaruna" is used as a general term referring to the Aguaruna linguistic group. When required, a distinction is made between the "Mayo Aguaruna" or "Marañón Aguaruna" subgroups. Later chapters which deal specifically with the Mayo Aguaruna use "Aguaruna" as a descriptive term for that subgroup. Reference to the main population of Aguaruna will include the Marañón modifier.

²"Jivaroans" refers to all four groups.
affinities with each other and their languages are mutually intelligible.

**Historical Background of the Jívaros**

The first mention of the Jívaros occurs in the ethnohistoric accounts of Inca expansion (Stirling 1938: 3). Tupac Yupanqui, an Inca leader, made expeditions into eastern Ecuador during his
conquest of Quito in the mid-15th century. His son, Huayna Capac, later unsuccessfully attempted to bring the Jívaros under control. However, he nominally included Jívaro territory in the Inca realm (Stirling 1938: 4). When the Spanish arrived in what is now Ecuador, they were convinced that the source of Inca gold lay east of the Andes, and in 1549 they sent Captain Benavente to explore the area occupied by the Jívaro proper. Juan de Salinas was the first Spaniard to explore the area now occupied by the Maranon Aguaruna. In 1559 he settled the town of Santa María de Nieva at the juncture of the Nieva and Marañón rivers (Stirling 1938: 10). Salinas found the Indians of the Marañón similar in dress, custom, livelihood, and language to the Jívaros of the Zamora and Upano tributaries of the Santiago River.

The Spanish explored what is now northern Peru, including Aguaruna territory, from a base in Ecuador. Several left bank tributaries of the Marañón River originate in the Ecuadorian Andes; they provide natural routes, if not easy access, from the populated highlands around Quito. Thus the expeditions for gold, which ended rather dramatically after a violent Jívaro revolt in 1599 (Bollaert 1863), were followed during the 17th century by Jesuit missionaries from Quito who traveled down the Chinchipe, Santiago, Morona, and Pastaza rivers (Stirling 1938: 16; Phelan 1967: 23). The town of San Francisco de Borja, below the junction of the Santiago and Marañón rivers, was settled in 1619; although raided and burned by Aguaruna and Huambisa several times during the following centuries, it remained a node of missionary activity and a settlement landmark
(Figure 6). In spite of the proximity of Borja to Aguaruna territory, most Jesuit influence was among the lowland Indians of the lower Marañón. The Jivaroans had established a fierce and aggressive reputation and were not overcome by European expeditions during the colonial era, despite the early and extensive Spanish contacts.

Increased commercial activity and an antiquarian interest in Jivaroan shrunken heads in the second half of the 19th century led to more contact with the region and an increasing amount of systematic information of the Jívaros (Bollaert 1863: 112). By the 19th century Aguaruna were making trading trips on the lower Marañón River as far as Barranca (Stirling 1938: 28). Up de Graff tells of an 1898 raid by Aguaruna and Huambisa on the Barranca trading post. He also describes Aguaruna settlements near the Santiago and Marañón rivers and gives perhaps the only first-hand description of an Aguaruna war raid against the neighboring Huambisa (Up de Graff 1923: 150, 272-283).³

Karsten published the first complete ethnography of the Jívaros based on his 1916-19 and 1928-29 expeditions to eastern Ecuador (1935). Stirling's ethnographic and historical monograph was based on a short field stay in the early 1930s (1938). Both of these early works are primarily on the Jívaro proper of Ecuador, but the similarities in material culture and social custom among all Jivaroan groups allows both studies to be used for description of Aguaruna life. Karsten (1935: 79) writes, when finally locating an Aguaruna settlement along a tributary

³Up de Graff (1923) refers to the Aguaruna as Antipas.
of the Agapa River:

They were really Jíbaros [sic]. The type is easily recognizable, and the dress and the whole external appearance was the same as that of the Jíbaro [sic] Indians I had recently visited far away in the Ecuadorian forests. Even the language was in the main the same, although I could at once find considerable dialectical differences. Sometimes they used words which we did not at once understand, but the conversation on the whole proceeded quite nicely.

The missionary Grubb (1930) describes the Marañón Aguaruna as essentially the same as the Jívaros to the north.

In the 19th and 20th centuries trade and warfare contributed to the spread of Jivaroan groups as far as the Pastaza River to the north and east, the Marañón River to the south, and the Zamora and Chinchipe rivers to the west. The Aguaruna are located primarily in the Department of Amazonas, but some 3000 Aguaruna live along the Agapa, Potro, and Cahuapanes tributaries of the lower Marañón River (Karsten 1935, Stirling 1938, Flornoy 1954, Corbera 1983). Their presence in the Department of Loreto results from Aguaruna and Huambisa trips to lowland missions and trading posts for raids and commerce to obtain steel tools (Stirling 1938, Up de Graff 1923). The Jivaroan custom of relocating settlements and their propensity for settling along small streams in hilly, upland areas made it feasible to explore or flee up the Agapa, Potro, and Cahuapanes rivers after trading or raiding forays along the lower Marañón River. Anecdotal evidence suggests Aguaruna-Huambisa warfare caused the downriver dispersion of Aguaruna. Trade, however, undoubtedly also played a part. No evidence exists that violence or interfamilial killings prompted the subsequent migration of Aguaruna into the
Alto Mayo Valley in the mid-1900s. Brown (1981: 14) indicates that the search for a trade route to Chachapoyas motivated migration.

**Contemporary Jivaroan Research**

Contact through trade and association with missionaries have prompted the seemingly inevitable absorption of native groups into the national culture and much of the recent research on Jivaroan groups deals with culture change. In the last several decades missionary contact and an encroaching colonization frontier in Ecuador have eroded the Jívaros' centuries-long resistance to external contact. Harner (1963; 1968; 1972) was one of the first anthropologists to demonstrate the important connections in Jívaro society between contact with mestizos, "white man's goods", trade, shamanism, and technology.

The Jívaro proper are now organized into a Shuar Federation (Salazar 1981) which developed from the influence of Salesian missionaries and from a desire to have a unified front in dealing with colonists. The Shuar Federation has affected social, cultural, and economic structure of the people, but equally it serves as an example of how communication and education can promote indigenous causes. Another Jivaroan group, the Achuar, are settling into nucleated centers (Taylor 1981); they are attracted by trade goods and missionary schools as well as by the legal and economic factors that prompt cattle raising among jungle tribes (MacDonald 1981; Descola 1981).

Conflict between Perú and Ecuador during the early twentieth
century led to redefinition of that international boundary, establishment of military outposts on either side, and designation of territorial limits for the Jivaroan groups. As a consequence, recent work on the Aguaruna comes from researchers working out of Perú and living, for various lengths of time, in the Marañón area. Both Jesuit missionaries and the Summer Institute of Linguistics (SIL) began work among the Upper Marañón Aguaruna in the 1940s. Their subsequent work on language (Larsen 1966; Fast and Larsen 1974), myths (Guallart 1958; Chumap Lucia and Garcia Rendueles 1979), and ethnobiology (Guallart 1962; 1968a; 1968b) contributes to an understanding of the Aguaruna who previously were overlooked and received attention only from an occasional traveler or scholar.

Further ethnobiological research considerably illuminated both the nature of Aguaruna subsistence and how the Aguaruna understand and classify the natural world (Berlin 1977; Berlin and Berlin 1977; Berlin and O'Neill 1981). Other recent work on the Marañón Aguaruna includes historical and ethnographic studies as well as documentation of native land titling problems (Sivierts 1972; Guallart 1964, 1981).

The Marañón Aguaruna now find their hilly and forested uplands in the path of an oil pipeline, military maneuvers to protect the Peruvian border, and colonists who are encouraged to settle the area so that it may be "occupied" in the face of Ecuadorian encroachment (Sivierts 1972; Guallart 1981). The Peruvian government initiated a special project in the area in
1983. The main area of project influence is south of the zone inhabited by Marañon Aguaruna, but the project includes all of the Department of Amazonas and its directors are developing plans to include the Aguaruna communities (Vega 1982).

The increased activity and pressure for land in the Marañon Valley are an impetus for some Aguaruna, especially those nearby frontier settlements and the oil pipeline road, to join the mestizo migration to the Alto Mayo Valley. Once in the Mayo Valley the mestizos look for seasonal jobs or scarce land to begin rice cultivation. The Marañon Aguaruna move into native communities settled over forty years ago by Aguaruna from the Cahuapanes-Potro region.

The Aguaruna in the Alto Mayo Valley

Aguaruna Indians started migration around 1940 from the Marañon Basin over the watershed into the Mayo River basin (Figure 7). In addition to their search for a trade route to Chachapoyas (Brown 1981: 14), they sought new hunting grounds and perhaps escape from disputes. Impressed with the abundant game and large, uninhabited tracks of land in the valley, several families soon settled in the Mayo basin. All of the oldest Mayo Aguaruna were born in "Potro" or "Kaupan", rivers and areas to the northeast of the Alto Mayo Valley. No evidence exists that the Aguaruna encountered other native groups in the Mayo Valley or during the five day walk from the Cahuapanes River basin. Stone axes and

4Proyecto Especial Jaen-San Ignacio-Bagua (PEJSIB).
mortars, however, and other signs of previous inhabitants are often found when clearing fields in the Mayo Valley.

The Aguaruna frequently returned to their home areas after first settling the valley in attempts to encourage relatives to immigrate and to maintain contact with their families. Every four or five years one of the older men will yet take his sons or nephews to his natal home; relatives from the Cahuapanes region also make occasional trips to the Mayo Valley. Contact otherwise is limited. Aguaruna in the Cahuapanes drainage number approximately 3000 and they are among the most isolated of Aguaruna groups (Corbera 1983).

As Aguaruna migrated to the Alto Mayo Valley, they settled the gently dissected uplands away from the floodplain. Mestizo inhabitants settled along the banks of the Mayo River probably inhibited Aguaruna settlement in the most accessible riverine areas at that time. Nevertheless, expanses of floodplain were uninhabited in the area around the present day towns of Nuevo Cajamarca, San Fernando, and La Union. The first Aguaruna settlements in the upper reaches of the Mayo basin were in the area now delimited as the communities of Shimpiyacu and Huascayacu.

also provides documentation and analysis of Aguaruna magic, myth, and song (1978; 1981; Brown and Van Bolt 1980), and it analyzes the peculiar circumstance of Aguaruna suicide (1982). Notwithstanding Brown's careful scholarship, especially his insight into the impact of the Carretera Marginal de la Selva on the Alto Mayo Aguaruna, rapid change in the area warrants continuing analysis of acculturation and adaptation.

Patterns of Traditional Aguaruna Life

An understanding of change among the Mayo Aguaruna best derives from a description of the baseline data. Many aspects of traditional life are similar among the Mayo and Marañon groups, and hence subsistence patterns recorded in the Marañon valley (Berlin and Berlin 1977) may reasonably be ascribed to facets of Mayo Aguaruna existence. Agricultural change touches questions of traditional Aguaruna life chiefly in three areas: subsistence, settlement, and social organization. These areas also are part of the matrix of development to be discussed in later chapters.

Subsistence

Cultivation. The bulk of Aguaruna foodstuff comes from mixed gardens of manioc and other staple tubers. Men clear sites for gardens but women are solely responsible for planting, cultivating, and harvesting subsistence crops. Women cultivate two types of gardens: a house garden immediately surrounding the house compound, containing staple food plants but also a wide variety of fruit,
medicinal, and assorted other useful plants; and an outfield subsistence
garden within a kilometer or so of the home with primarily sweet
manioc (Manihot esculenta).

Sweet manioc, a one to two meter shrub with large tuberous
roots, is the main subsistence crop. Aguaruna women identify at
least a hundred different varieties of manioc (Boster 1980) all of
which are sweet rather than bitter manioc.

Gardens surround virtually every Aguaruna house. They serve
as areas for experimentation with new plants and also as the
source for a wide range of plants for daily use. Berlin and
Berlin (1977) list 80 cultivated or semi-cultivated plants among
the Marañon Aguaruna, many of them found in house gardens.
Brown (1984: 129), in his work in the Mayo Valley, records 24 dif­
ferent species in a garden in Huascayacu. Gardens recorded during
my field work in 1982-83 show a comparable diversity around houses
in Shimpiyacu and Bajo Naranjillo (Figure 8). House gardens are
first planted with manioc, then other plants are added. A house
garden cultivated for more than a year has great variety of economic
plants including bead seeds and other ornamentals, coloring and
dye plants, cooking herbs, medicinals, fruit trees, and palms.

While manioc, other tubers, and plaintains (Musa balbisiana)
appear in house gardens, the bulk of these food crops are cultivated
in outfield gardens of about one quarter to one half a hectare.

\footnote{Bitter and sweet manioc are variants of the same species
(Manihot esculenta). Bitter manioc contains a prussic acid which
must be removed before ingestion. Sweet manioc is prepared as
a pot vegetable. See Rogers (1967), and Rogers and Fleming (1973)
for a discussion of the botanical characteristics of Manihot esculenta.}
Figure 8. Aguaruna house gardens.
Placement of outfield gardens within easy walking distance of the house facilitates carrying baskets full of manioc. The outfield garden (yucal) consists primarily of manioc, sweet potato (Ipomoea batatas), and yams (Dioscorea trifida). It can also contain taro (Colocasia esculenta), cocoyams (Xanthosoma sp.), peanuts (Arachis hypogaea), papaya (Carica papaya), sugarcane (Saccharum officinarum), cocoona (Solanum sp.) and protected palms (Figure 9).

Women sometimes work alone in outfield gardens, but more frequently they form work groups with one or more female friends and female relatives. Cultivation and harvesting of manioc and the other tubers are concurrent activities. Women weed their gardens by scraping the weeds at ground level with flat tipped machetes and by chopping larger weed stems. A few hours of weeding will be varied by harvesting and replanting manioc from the cleared area. Soil is loosened around the root base of the plant with short stabs of a machete or digging stick and thereafter the entire plant is pulled up to get the edible roots. The woody stem of the manioc plant is then cut into approximately 30 cm pieces which are considered as "seed" to be replanted. Often the entire stem is stuck back in the ground to regrow a root bunch. The plant debris from weeding and harvesting is piled up and burned with smoldering coals brought to the fields. Uncleared parts of the manioc garden often look overgrown and abandoned. Women plant sweet potatoes as a ground cover that eliminates some weed growth. Yams trellis on sticks and trunks left in the field, and on corn stalks.
Figure 9. Outfield gardens in Bajo Naranjillo.
Hunting. Many of the faunal species found in the Alto Mayo Valley provide important animal resources for the Mayo Aguaruna. Hunting and capture of birds, fishes, and mammals form part of daily subsistence. Collared peccary (*Tayassa tajacu*), white-lipped peccary (*Pecari tajacu*), red deer (*Mazama americana*), armadillo (*Dasypus sp.*), aguti (*Dasyprocta aguti*), coati (*Nasua sp.*), paca (*Cuniculus paca*), and an occasional tapir (*Tapirella sp.*) are favored large animals. Ocelots (*Telis pardolis*) are hunted for their skins although law now prohibits their sale. They are, however, still occasionally hunted by both colonists and Aguaruna. Monkeys (*Cebus sp.*, *Alouatta seniculus*, *Ateles sp.*) are abundant and hunted for meat in the Mayo forests. Birds most frequently hunted by the Aguaruna include tinamous (*Tinamus sp.*, *Crypturellus sp.*), curassows (*Crax mitu*), toucans (*Ramphastos sp.*, *Pteroglossus sp.*), doves (*Leptotila sp.*), pigeons (*Columba sp.*), guans (*Penelope jacquacu*, *Pipile cumanensis*), and chachalacas (*Ortalis guttata*).

Meat is an important component of daily meals. Men hunt individually, as well as in kin groups, on trips of a day or several days duration. They hunt large animals with a shotgun, although blow guns are still used, especially by young boys as they learn to hunt birds along the forest paths. Men clearing a field will take along a shotgun with the hope of shooting an animal. When Aguaruna hunters find the nests of burrowing animals such as armadillo or paca, they dig tunnels into the nests to rout the animals. Dogs are also used to track and kill animals as large as the white lipped peccary.
Fishing. The Aguaruna catch and consume fish as a regular foodstuff. They primarily use fish poisons: huaca (Clibadium sp.), usually grown in house gardens and outfields, is most common; barbasco (Lonchocarpus nicou), sometimes found in outfields, is used less frequently. Fishing with poisons is a group activity in which women, men, and children participate. Extended families or community groups work together preparing the fish poison and collecting fish.

Women gather the leaves, stems, and florescence of huaca which are then crushed with a wooden pestle either in holes in clayey ground or in holes formed in logs. The huaca paste, which must be used within a day, is then put in hourglass-shaped wicker baskets.

Most effective use of the fish poison occurs in small creeks and streams that can be dammed, or where water flow is restricted. For example, when heavy rains cause the Huascayacu River to rise, water backs up into small tributary channels that carry runoff during the rainy season. As the channels fill with muddy river water, one or two members of the group, male or female, immerse the baskets of huaca in the flowing water. The poison stuns the fish and they float to the surface where they are easily gathered by the rest of the group. A single catch yields enough fish for several meals, and fishing will continue for several days if the river remains at a high stage of flow. Under favorable conditions initial yields may be a kilogram of small (10 cm) fish for each of the several households, gradually diminishing there-
after to a few fish per gatherer.

Hook and line and hand catching are other fishing methods. Throw nets are sometimes used in wide, shallow rivers such as the Naranjillo, Tumbaro, and Cachiyacu.

The fishes found in the Mayo and tributaries are not so large as the giant fish of the Amazon River, but they do provide an important food source for the local population. Fishes caught most frequently include: carachama (Canthopomus genibarbis), mamayac (Pterygoplichthys gibbiceps), and bagrey (Pseudoplatysona fasciatum). The Aguaruna do not commonly fish in the Mayo River, although they sometimes catch a shad (Brycon sp.) and large carachama in it.

**Foraging.** Foraged food provides variety of taste and nutrients for the Aguaruna more than bulk. Food from the forest may be spontaneously gathered when passing through the forest or it may be the product of a specialized gathering trip. Berlin and Berlin (1977) list 119 foodstuffs gathered by the Marañon Aguaruna, indicating the great number of plants that the Aguaruna identify and collect.

Palm products are perhaps the most important foraged food (Table 1). The fruits of unguravi (Jessenia weberbaueri), pifayo (Quilielma gasipaes), aquaje (Mauritia flexuosa), varina (Phytelephas microcarpa), and huicungo (Astrocaryum huicungo) are gathered and eaten. Palm fruits such as aquaje and unguravi must be soaked in tepid water for several hours before they are edible. The Aguaruna make an alcoholic drink from pifayo palm fruits. Heart of palm
<table>
<thead>
<tr>
<th>Common Name</th>
<th>Aguaruna Name</th>
<th>Botanical Name</th>
<th>Useful Portion</th>
</tr>
</thead>
<tbody>
<tr>
<td>yarina</td>
<td>châpi</td>
<td>Phytelephas microcarpa</td>
<td>fruit, leaves</td>
</tr>
<tr>
<td>aguaje</td>
<td>áchu</td>
<td>Mauritia flexuosa</td>
<td>fruit, heart</td>
</tr>
<tr>
<td>huacrapona</td>
<td>tuntuâm</td>
<td>Iriartea ventricosa</td>
<td>heart, trunk</td>
</tr>
<tr>
<td>morona</td>
<td>kûpat</td>
<td>Iriartea deltoidea</td>
<td>heart, trunk</td>
</tr>
<tr>
<td>cashapona</td>
<td>kupal</td>
<td>Socratea exorrhiza</td>
<td>heart, trunk</td>
</tr>
<tr>
<td>cullo coroto</td>
<td>kuunt</td>
<td>Wettinia maynensis</td>
<td>heart, trunk</td>
</tr>
<tr>
<td>unguaravi</td>
<td>kugkûk</td>
<td>Jessenia weberbaueri</td>
<td>heart, fruit</td>
</tr>
<tr>
<td>sinamillo</td>
<td>shîmpi</td>
<td>Oenocarpus multicaulis</td>
<td>fruit, leaves, trunk</td>
</tr>
<tr>
<td>pona</td>
<td>kûun</td>
<td>Euterpe precursoria</td>
<td>trunk</td>
</tr>
<tr>
<td>yuyu chonta</td>
<td>yayû</td>
<td>Euterpe sp.</td>
<td>leaves, trunk, heart</td>
</tr>
<tr>
<td>chambira</td>
<td>bataê</td>
<td>Astrocarum chambira</td>
<td>leaves, fruit</td>
</tr>
<tr>
<td>huicungo</td>
<td>uwân</td>
<td>Astrocarum huicungo</td>
<td>heart, fruit</td>
</tr>
<tr>
<td>niejilla</td>
<td>kamanchâ</td>
<td>Aiphanes gracilis</td>
<td>fruit</td>
</tr>
<tr>
<td>chontilla</td>
<td>âun</td>
<td>Bactris brongnartii</td>
<td>fruit</td>
</tr>
<tr>
<td>pifayo</td>
<td>uyâi</td>
<td>Guilielma gasipaes</td>
<td>fruit</td>
</tr>
<tr>
<td>shapaja</td>
<td>kûakish</td>
<td>Sheelea sp.</td>
<td>heart, leaves</td>
</tr>
</tbody>
</table>

Table 1. Palms used by the Aguaruna. Sources for species identification: Berlin and Berlin (1977); MacBride (1960).
or chonta is a favored food and one of the few vegetables in the Aguaruna diet. Chonta can come from a number of palms with tender edible bundles of growing leaf tips. Species exploited by the Mayo Aguaruna include pona (Euterpe precatoria), huacrapona (Iriartea ventricosa), aguaje, unquaravi, and pifayo. The Aguaruna do not cultivate palms but they do protect them in fields; palms are not cut when clearing fields for subsistence gardens. Palms such as varina and shapaja (Sheelea sp.) are especially protected in this manner for use as thatch. Ironically, because of current clear cutting of forest for rice cultivation, some families can eat heart of palm for several days in succession, a dietary splurge for the Aguaruna.

The Aguaruna eat with great relish the beetle suri (Coleopterus sp.) at its larval stage. They cut down palms to promote special breeding places for the beetle. Similarly, fallen palms in the forest are sources of the beetle. The beetle grub matures in a few weeks and special trips are made to collect particularly the grubs and also the beetle. Both men and women eat suri either raw or roasted on skewers; it is, however, a favorite food for women who often crave it.

The Aguaruna also gather wasps nests for the larva that are roasted, and they collect swarming ants, including a large brown velvet ant, considered to be a delicacy. Frogs and snails from creeks and the damp forest also provide food for the Aguaruna diet. Children often bring home frogs which they catch in nearby creeks. People gather snails while bathing or washing in streams
or when walking along forest paths.

Domestic Animals and Pets. Most Aguaruna keep chickens around the compound for occasional consumption and to sell when cash is needed. Other domestic fowl such as Muscovy ducks, turkeys, and doves are kept as dooryard animals but rarely eaten. Poultry feed on bits of corn and rice, and from scraps swept out of cookhouses; they range freely around yards and nearby areas. Chicken coops often are built in the compound to provide protection against wild animals and bats at night. The Aguaruna place setting hens in baskets inside their houses, but chickens often lay their eggs outside the compound. While nearly all Aguaruna keep a few chickens, one family in Bajo Naranjillo raises chickens for sale in the villages of Naranjillo and Nuevo Cajamarca. A man in Dorado raises turkeys for sale in local markets. Some families clip the wings of the curassow (Crax mitu) to restrict them to the compound.

The Aguaruna do not eat beef or pork and raise neither cattle nor pigs. SINAMOS (Sistema Nacional de Apoyo a la Movilización Social) tried to establish a pig farm in Bajo Naranjillo during the 1970s (Brown 1984: 106) but that venture was unsuccessful. One of the reasons for its failure was that the Aguaruna had no interest in raising pigs.

Most Aguaruna keep one or more dogs used as protection and for hunting. A few Aguaruna keep cats. Other household pets include monkeys, white-lipped marmosets, macaws, various green parrots, and coati mundis.

Meals and Food Preparation. Manioc is by far the most commonly
eaten root crop. Sweet potatoes and yams are favored alternatives, valued chiefly because of the variety they give to the diet. Other common foodstuffs include taro and cocoyams, although these are infrequently eaten compared to manioc, sweet potatoes and yams. Plantain is the other staple foodstuff eaten regularly by the Aguaruna.

The Aguaruna most often boil the tubers and plantains in pots over a fire where three or four logs converge to form a hearth. They also cook them by roasting against the coals of a fire. Another cooking method, called pajarasca, involves wrapping small fish, frogs, grubs, eggs, animal innards, or hearts of palm in bijau (Heliconia sp.) leaves to form a bundle tied with fiber strips. The bundle is set in the fire where the outer leaves dry and burn but the interior cooks by steaming. Food cooked in this manner can be stored for several days.

The Aguaruna smoke meat over a fire. They singe off the hair yet leave the skin, thereby retaining much of the moisture of the meat during smoking. The gutted animal is then placed on a rack above a fire for seven or more hours, depending on the size of the animal. The meat is eaten as smoked meat or boiled to make an unsalted broth served with manioc. Smoked meat lasts for several days and is used often as a trip food or as a gift to relatives in other communities. Birds are plucked and smoked or roasted over the fire on a skewer. The Aguaruna most commonly cook fish by pajarasca without seasoning. Fish are also skewered and roasted over a fire, or boiled and eaten as a soup.

The Aguaruna have three main meals, although women and children
snack during the day and rarely sit down to share a meal as a family. Women serve meals at a table or to the family and guests clustered on small benches around the fire. For breakfast a hot drink of lemon grass tea, cooked ripe bananas, or a thin oatmeal gruel is served with manioc or sweet potatoes. Sometimes a bowl of soup or a piece of meat accompanies the meal. Boiled manioc and boiled or roasted plantain provide the mainstay for midday and evening meals, along with smoked meat or fish on occasion. Grubs, frogs, snails, gathered fruits and leaves, peanuts, and roasted corn offer further variety. Aguaruna women serve masato, a fermented beverage made from manioc, at all meals and social occasions.

Settlement and Material Culture

Settlement. The Aguaruna have traditionally occupied the hilly, dissected foothills of the Andean range. They live in extended family compounds containing up to three houses. The typical family unit within a compound includes a husband and one or two wives (often sisters), children, and other kin (in-laws, siblings, and cousins). The extended families often live in one large house (8 x 15 meters), although additional structures in a clearing may be occupied by married children and their families or by siblings. Nucleated house clusters of related members are approximately one kilometer distant from each other.

The dispersed settlement pattern appears to have resulted from the warfare that was common among Jivaroan groups and from the need to adapt to scattered resources in the tropical forest.
Accusations of witchcraft, or jealousy from family and marital disputes, often led to war raids within a tribe. Thus, considerable distance between settlements lessened the chance for raiding and warfare. Warfare between tribal groups had its foundation in the capture of souls and acquisition of power through the act of killing (Harner 1962). Widely separated settlements and an uninhabited area between tribal groups (Up de Graff 1923; Descola 1981) also assures adequate forest resources for hunting and gathering subsistence needs (Ross 1980).

Warfare no longer exists among the Aguaruna or among other Jivaroan groups, and the boundary between Jivaroan settlements and territories fades as trade and contact between groups, and with the outside world, increase. The dispersed settlement pattern remains, however, because the Aguaruna have in large part maintained a traditional basis for subsistence.

Material Culture. The compound provides the hub of Aguaruna life. The spacious houses are built with palmwood sides that let sunlight and air into the smokey interiors. Dirt floors, dampened and pounded to keep down dust, rustic benches and beds, and the perpetual fire, structure the interior. The outside yard is kept cleared and swept. A few chickens scratch in the yard, beyond which is the house garden.

Traditional Aguaruna houses have an oval shape and are constructed entirely of material acquired in the forest (Figure 10). Split and flattened palm (either Iriartea ventricosa or Euterpe precatoria) form the walls. Vertical structural poles are linked by crossmembers
that hold the vertical siding.

Roofs are made of overlapping panels of *varina* (*Phytelephas microcarpa*) and *shapaja* (*Scheelea sp.*) palm leaves, and the panels are lashed to the pitched roof frame. The rounded roof-ends require building a scaffolding inside the curved walls and tying the fitted roof pieces to the roof frame. The interior symmetry created by carefully made roofs of the oval houses is exquisite.

Aguaruna houses do not have windows. Patterns cut into the vertical wall boards and spacing of the palm wood siding do, however, allow entrance of light and air and exit of smoke from cook fires. The Aguaruna periodically change the location of fires, the thatch roof thereby becoming more or less evenly blackened. Entrances are blocked by several vertical poles set into a frame near the roof line. The poles reach the floor and can be set aside for

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**Figure 10. Traditional Aguaruna house layout.**
entrance or exit and replaced to keep out chickens, dogs, and other animals.

Cooking, eating, and sleeping take place under the same roof, commonly without formal dividers to separate the activities. When dividers are created they most often separate a sleeping area. Houses are open and spacious enough to accommodate the bustle and activity of people and animals that cluster around for the evening meal.

Locally manufactured household objects include baskets, ceramics, wooden benches, troughs and pestles, and fire fans. Men make baskets; they weave several shapes and sizes for carrying manioc, fishing, and storage (Brown 1984: 159). Women make ceramic pots ranging in size from those for storing masato to small bowls for drinking and eating (Brown 1984: 155). Carved tree trunks serve as seats and stools, raised split-palm platforms form beds, and benches and sometimes roughly hewn tables are furnishings.

Society

As the Aguaruna settlement pattern is based on family units, so the social and political structure reflect familial organization. This topic, covered thoroughly by Brown (1984), receives review here only as a baseline from which to assess change.

The basis of kinship among the Aguaruna derives from bilateral lineage that recognizes blood relatives on both the male and female side. In addition to recognition of immediate family and in-law relationships which form the basic family unit, the Aguaruna also
consider most people within a region to be related. Endogamy has enabled the Mayo Aguaruna to maintain kin relationships, either near or distant, among themselves. When the Mayo Aguaruna received title to their land in 1975, the community boundaries encompassed various segments of the dispersed family network. Members of a community today often have their closest relatives within that community and more distant relatives belonging to other communities.

Before the advent of official communities the patriarch of an extended family influenced any major decisions that needed to be made and arbitrated in disputes. Along a river or within a settlement zone, one man was frequently respected or known for his bravery and spiritual knowledge. Little other political structure existed. The physical and social structure imposed by titling established the need for a titular head of each community. Offices of apu (chief), sub-apu (roughly, vice president), secretary, and treasurer were assigned. The designation of people to fill the positions, however, closely adhered to the traditional Aguaruna values of respect and control through kinship ties (Brown 1984: 98).

Substantial social and political reorganization does not occur until rice cultivation becomes dominant, and until need for the skill and influence of educated, bilingual leaders supersedes traditional social values.
Ill
FACTORS INFLUENCING CHANGE

The upper reaches of the Mayo Valley were sparsely settled when the Aguaruna first arrived some 40 years ago, and the area was settled without interference. After settlement the Aguaruna had contact through trade or as laborers with mestizos living along the river banks, but until the mid-1950s people outside of the region were unaware that Aguaruna were living in the valley.

Road surveys in the area began in the 1950s for the proposed Carretera Marginal de la Selva (Belaunde 1965; Snyder 1967). North American survey crews first encountered Aguaruna near the Naranjillo River. They asked the Summer Institute of Linguistics (SIL) to identify the tribe. SIL, thinking perhaps they were Aguaruna, sent an Aguaruna teacher from the Marañon region to investigate. He verified that the people were Aguaruna speakers but it was not until some 15 years later that SIL sent trained Aguaruna teachers into the Mayo Valley to establish schools.

Bilingual Education

In 1970 two Aguaruna teachers visited the Mayo Valley to talk with local Aguaruna about establishing educational facilities. They found the Mayo Aguaruna were loosely organized and, especially
in the area of the Naranjillo River, in a system of debt peonage to local mestizo landholders. Two mestizo families with large farms near the mouth of the Naranjillo River had Aguaruna working for them. One of the families had several Aguaruna children living in the family house in Rioja where they were educated and put to work doing domestic chores. The mestizo landowners were perturbed at the incursion of educated, bilingual Aguaruna trying to upset the labor system they had established. A series of legal problems ensued, culminating in the jailing of one of the teachers in Iquitos and the legal intervention of the Summer Institute of Linguistics (Brown 1984: 29). Nevertheless, the teachers began elementary level classes among the Mayo Aguaruna in 1972, thereby initiating significant change in Aguaruna life. The bilingual Marañon Aguaruna teachers helped disentangle the Mayo Aguaruna from a situation of labor indebtedness but they also ushered in the legal and political complications of land titling and the new world of education and commercial agriculture.

By 1975 eight schools were set up in what were to become the centers of the titled communities. The introduction of schools had impact at several levels on indigenous life. The schools brought bilingual, educated teachers into the communities, men who would serve as intermediaries between the Aguaruna and mestizos. Second, schools brought a focus to community life; they were a place children would spend part of their day, a meeting place, and an objective space within the community. Finally, education and schools established skills needed to participate in the national
culture. They introduced the idea of structured time and responsibility, the math and language skills necessary for communication in Peru, and the exposure to the history and culture of the nation. Instruction in the schools today is bilingual and the children learn to read and write in Aguaruna and in Spanish.

The Aguaruna Form Native Communities: Land Titling, 1975

A second major event that changed the Aguaruna communities was land titling and the accompanying influence from Lima. By the early 1970s the Mayo Aguaruna began to feel the pressure of immigration as new settlers cleared areas the Aguaruna thought to be theirs. The threat of encroachment was mitigated by the intervention of SINAMOS (Sistema Nacional de Apoyo a la Movilización Social), a social action agency of the military government. Strong support for Indian rights existed within SINAMOS and the organization had the backing of Velasco, then President of the military regime which overthrew elected President Fernando Belaunde Terry in 1968. Because of the prevailing influence of the military government, SINAMOS was able to push through title to nearly 60,000 ha of land for the Aguaruna in the Mayo Valley (Table 2). The Marañon Aguaruna who lived in the communities and a few of the Mayo Aguaruna who had been educated in Rioja by mestizo landowners were instrumental in working towards land titulation for the Mayo communities.

Titling involved collaboration between the Aguaruna and SINAMOS personnel to determine boundaries that were approved by the Ministry of Agriculture. The titled areas, known as comunidades nativas
Table 2. Titled area in Mayo Aguaruna native communities.

<table>
<thead>
<tr>
<th>Community</th>
<th>Area (ha)</th>
<th>Date of Titling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bajo Naranjillo</td>
<td>6,642.0</td>
<td>December, 1975</td>
</tr>
<tr>
<td>Alto Naranjillo</td>
<td>2,356.5</td>
<td>&quot;</td>
</tr>
<tr>
<td>Shampuyacu</td>
<td>4,825.6</td>
<td>&quot;</td>
</tr>
<tr>
<td>Alto Mayo</td>
<td>10,123.1</td>
<td>&quot;</td>
</tr>
<tr>
<td>Dorado</td>
<td>3,371.6</td>
<td>&quot;</td>
</tr>
<tr>
<td>Huascayacu</td>
<td>7,290.0</td>
<td>&quot;</td>
</tr>
<tr>
<td>Shimpuyacu</td>
<td>8,756.2</td>
<td>&quot;</td>
</tr>
<tr>
<td>Morroyacu</td>
<td>13,400.8</td>
<td>&quot;</td>
</tr>
<tr>
<td>San Rafael (^1)</td>
<td>1,175.0</td>
<td>March, 1983</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>57,941.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

\(^1\) San Rafael was settled in 1976 by several families from the Maranon region. Because San Rafael was titled long after the outgoing of a government sympathetic to Indian rights, it did not benefit from favorable government policy for native land acquisition. It is the smallest of the communities.
the communities along the Carretera have had to confront acculturation sooner than the other communities more distant from avenues of contact with the mestizo culture.

Land titling marked a significant change for the Aguaruna who previously lived in scattered family settlements and recognized kinship and linguistic ties. Now they were members of specified group, they were nativos (natives). In the Mayo Valley they were divided into eight discrete communities and they had to begin functioning socially and politically as members of a community.

Titling also marked a change in land use and ownership. Before titling the Aguaruna lived in the forest with essentially unlimited access to its resources. After titling the forest became property and it had boundaries. Scazzocchio (1980: vi) comments on the phenomenon of the changing concept of land as it is occurring throughout Amazonia:

The recent process of frontier expansion is characterized by a shift from implicitly recognized occupation of forest areas to appropriation on the basis of ownership conferred by a legal deed specifying boundaries. This shift marks the transition from an extractive front to a pioneer front, from the exploitation of resources within the forest to the transformation of the forest into land.

Land titling reoriented the Aguaruna spatially and also initiated economic change. The forest came to be perceived as a limited area and land itself became an object of value.

Migration and Colonization: The Rice Boom

An influx of colonists from the Departments of Cajamarca and Amazonas to the Alto Mayo Valley began gradually in the early
1970s and increased dramatically immediately before the completion in 1977 of the Carretera Marginal de la Selva. As recently as 1940 only 16,804 people lived in the Alto Mayo Valley. Population increased to more than 30,000 by 1972 and to nearly 75,000 in 1981. In the province of Rioja, which includes several Aguaruna communities, population increased nearly fourfold in ten years, from 10,444 to close to 40,000 (Perú-CODESAM 1981) (Table 3). Mestizo families came into the region at the rate of ten per week during the late 1970s (Perú-PEAM 1982a) and the Aguaruna became an insignificant minority in the valley. Population in 1981 for the Aguaruna communities totaled 1303 inhabitants (Table 4).

Mestizo colonists emigrated from the Departments of Cajamarca and Amazonas because of drought during the early 1970s, rumors of the soon to be completed Carretera Marginal, and because of the availability of land having relatively good soils and climate. They brought a sophisticated knowledge of rice cultivation and a tradition of irrigation agriculture that were easily transferable

<table>
<thead>
<tr>
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<th>1940</th>
<th>1961</th>
<th>1972</th>
<th>1981</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moyobamba</td>
<td>12,064</td>
<td>15,850</td>
<td>20,759</td>
<td>36,281</td>
</tr>
<tr>
<td>Rioja</td>
<td>4,740</td>
<td>6,639</td>
<td>10,444</td>
<td>37,935</td>
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<tr>
<td><strong>Total:</strong></td>
<td>16,804</td>
<td>22,489</td>
<td>31,203</td>
<td>74,216</td>
</tr>
<tr>
<td><strong>Alto Mayo Valley</strong></td>
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<td></td>
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</table>

<table>
<thead>
<tr>
<th>Village</th>
<th>1974</th>
<th>1981</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bajo Naranjillo</td>
<td>143</td>
<td>304</td>
</tr>
<tr>
<td>Alto Naranjillo</td>
<td>50</td>
<td>71</td>
</tr>
<tr>
<td>Shampuyacu</td>
<td>101</td>
<td>131</td>
</tr>
<tr>
<td>Alto Mayo</td>
<td>97</td>
<td>142</td>
</tr>
<tr>
<td>Dorado</td>
<td>81</td>
<td>105</td>
</tr>
<tr>
<td>Huascayacu</td>
<td>106</td>
<td>128</td>
</tr>
<tr>
<td>Shimpiyacu</td>
<td>120</td>
<td>144</td>
</tr>
<tr>
<td>Morroyacu</td>
<td>155</td>
<td>162</td>
</tr>
<tr>
<td>San Rafael</td>
<td>-</td>
<td>116</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>853</td>
<td>1,303</td>
</tr>
</tbody>
</table>

Table 4. Mayo Aguaruna population, 1974-1981.  
Source: Perú-MinAg (1974); QAAM (1981b).

to the flat, fertile bottomlands of the Alto Mayo Valley. By the time the road was finally completed in 1977 several thousand immigrants had settled in the area to the north of Rioja, thereby changing both its urban and rural character. Several new towns sprang up along the highway and during nine years population density increased from four to 36 persons per square kilometer in the more densely settled districts (Perú-CODESAM 1981).

With the advent of the agricultural colonists, rice fields became conspicuous on the landscape; once ubiquitous forest now exists only as scattered remnants. Nearly 20,000 of the 50,000 hectares of good agricultural land in the valley were planted with rice by 1983. Eight thousand hectares are irrigated and produce twice that of unirrigated rice (4-5000 kg/ha versus 2000 kg/ha).
The sudden, widespread changes in the Alto Mayo Valley, brought dramatic changes to the rhythm of life for all inhabitants. For the Aguaruna the changes marked a significant economic reorientation, the manifestations of which are evident on the landscape and in social structure of the communities.

**Location and Access of the Aguaruna Communities**

The communities of Bajo Naranjillo, Shampuyacu, and Alto Naranjillo are along the road and the Naranjillo River near the mestizo settlement of Naranjillo (Figure 11). Some interaction occurs among these three communities and the town of Naranjillo; the Aguaruna purchase goods in Naranjillo, mestizos consult the Aguaruna nurse at the medical post in the native community of Bajo Naranjillo and they sometimes work as agricultural day laborers for the Aguaruna. For both the Aguaruna and the mestizo settlers of Naranjillo, however, commercial and official orientation is toward Nuevo Cajamarca and Rioja, distant by truck thirty minutes and an hour, respectively.

The community of Alto Mayo lies about two hours' walk from the Carretera Marginal and about 3 kilometers from the town of Naranjos. Minor purchases are made in the town of Naranjos, but the Aguaruna community is oriented toward the mestizo towns of Nuevo Cajamarca and Rioja.

Dorado and Huascayacu, located on the left bank of the Mayo River, are the most inaccessible Aguaruna communities. Dorado occupies a clayey area along a cliffed portion of the river. Its inhabitants have access to the mestizo market in Nuevo Cajamarca.
Figure 11. Location and access of the Mayo Aguaruna communities. Source: Peru-PEAM (1982b).
via a five hour boat ride to San Fernando and a one hour truck ride to Nuevo Cajamarca. The natives of Dorado also cross the Mayo River and walk five hours through the community of Bajo Naranjillo to the Carretera Marginal, then take a 30 minute truck ride to Nuevo Cajamarca. It is a three hour walk from the native community of Huascayacu to the riverside town of Atumplaya, then one hour by boat to a port near the mestizo town of San Fernando.

While Shimpiyacu, Morroyacu and San Rafael are the most distant communities, they have the advantage of easy access to the Huascayacu River, a navigable tributary of the Mayo River. A boat with a peki-peki motor takes four to five hours to reach Tahuisco, the port of Moyobamba. The return trip upstream takes eight to ten hours depending on the level and flow of the river.

Difficult access to markets for the Aguaruna comes from transportation obstacles. No road vehicles exist in any of the communities; motorized boats are found in Dorado, Huascayacu, Shimpiyacu, San Rafael, and Morroyacu. Communities without river access must walk paths or use public transportation both for personal affairs and transportation of crops to commercial centers. Public transportation in the Alto Mayo at present consists of several decrepit pickup trucks and vans which pass along the Carretera at irregular intervals. Only Bajo Naranjillo has a short path into the community which can be used by motor vehicles.

Most of the Aguaruna in the Alto Mayo have minimal contact

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2 A peki-peki is a 9 or 16 horsepower, air-cooled motor with a three meter shaft between the motor and the propeller.
with the urban centers of the area. Young men and sometimes children
go to nearby communities along the Carretera Marginal to buy medicine
or foodstuffs (bread, sardines, salt) during the week. On weekends
couples or families often travel to the mestizo town of Nuevo Cajamarca
to make purchases. For the left bank communities contact with
commercial centers consists almost exclusively of weekend trips
downriver on Saturday to attend the market at Puerto Tahuisco.
Contrastingly, the bilingual Aguaruna teachers in the communities
often have official activities in the towns of Rioja or Moyobamba.
Because of its location and political importance, the Aguaruna
community of Bajo Naranjillo has a wider range of contact than
the other native communities.

**Peruvian Settlement Planning and Indian Policy**

**Affecting the Aguaruna**

Lowland Indian populations have been influenced by traders,
missionaries, and settlers since the Spanish first arrived in South
America. In the last two decades, however, Peruvian national policy
for eastern Peru has had particularly profound impact on the inhabitants
of the area. Current national development efforts involve several
hundred thousand hectares and include areas occupied by indigenous
populations. Furthermore, the reach of technology and communications
assures that the impact of development planning will be deep and
far reaching. Natives formerly were able to retreat into the forest
in the face of encroaching settlement, but now that option is frequently
unavailable. The relatively advanced technology of the national
culture contrasts startlingly with the yet simple lifeways of the majority of native inhabitants and assures a dramatic confrontation between the two.

In the mid-1900s governments of the Andean countries began to show more interest in the vast eastern Amazonian lowlands. Several reasons prompted the new found interest. Coastal and highland cities were becoming overcrowded with rural migrants. Land fragmentation in the highlands made peasant life increasingly difficult. The Bolivian and Cuban revolutions (1952 and 1960, respectively) made government officials aware of the importance of agrarian reform in response to a growing population and increasing demand for land. Instead of redistributing land already held on coastal and highland farms, governments envisioned resettlement of people in what was perceived as a vast, fertile, and empty zone. Planned colonization schemes and spontaneous settlement along newly built roads were common throughout Latin America, although attempts at permanent settlement and sustained agricultural output largely failed.\(^3\)

Some of the first areas in Perú to be affected by the new settlement policies were those inhabited by Campa, Amuesha, and Shipibo Indians. Roads were built into the selva central (central jungle) from Huanuco to Pucallpa and early attempts at promoting

\(^3\)Many books, articles, and dissertations are written on this subject. For a general overview see Allen (1975); Butland (1965); Casagrande et al. (1964); Crist and Nissley (1973); Edelman (1967); Eidt (1962); Martinez (1976); and Stewart (1965). There are several dissertations on colonization in lowland Bolivia which offer good background and description of the colonization phenomenon: Henkel (1971); Hiraoka (1974); Stearman (1976); and Zeballos-Hurtado (1975). Nelson (1973) presents an excellent summary and critique of tropical settlement throughout the Americas.
immigration into the Amazonian lowlands wholly ignored the Indians already living there; no consideration was given the potential effect that economic development would have on indigenous groups (Figure 1).

The military government, which overthrew the government of Fernando Belaunde Terry in 1968, exhibited more direct concern for Indian rights. It appointed Peruvian anthropologists to develop and administer a program for titling native communities. A law passed in 1974 (Perú-Law No. 20653) allowed Indian tribes legally to possess community lands. More important, the law provided for personnel to carry out surveying and titling. Eight of the Alto Mayo Aguaruna communities, as well as 372 other native communities (comunidades nativas) in the selva, were titled as a result (Perú-MinAg 1982). Subsequent laws (Perú-Law No. 22175 in 1978 and Perú-Law No. 2 in 1980) reduced the concern for titling Indian lands and emphasized large-scale, capital-intensive projects aimed at the economic woes of Perú: timber, cattle ranching, and oil exploration and development were given priority. The emphasis of the new laws made it increasingly difficult for indigenous groups to gain title to land.

The Belaunde government, reelected in 1980, began almost immediately to reemphasize a policy of settlement and development of Amazonia. These efforts are concentrated in a series of special projects in eastern Perú (Figure 12). The projects are administered through the Prime Minister's office, rather than through the national planning institute or the individual ministries, so that they may
Figure 12. Special Projects (Proyectos Especiales) in Perú.
Source: Smith (1983).
receive international funding. Justification for the projects ranges from geopolitical, to the eradication of coca (Erythroxylon coca) by crop substitution, to the effort to increase agricultural production. Land is titled to native groups in several of the project areas (Jaen-San Ignacio-Bagua, Pichis-Palcazu, and Alto Mayo) and the projects must include Indian lands as part of the development program. Such developments profoundly affect indigenous life and perspectives.
IV

THE EFFECTS OF CHANGE: COMMERCIAL AGRICULTURE

AMONG THE MAYO AGUARUNA

The Transition from Subsistence to Commercial Agriculture

The influx of colonists into the Alto Mayo Valley has markedly influenced both mestizos and Aguaruna inhabitants of the zone. The most immediate effect for the Aguaruna has been the initiation of rice cultivation; a commercial crop cultivated by men now exists side-by-side with traditional subsistence gardens cultivated by women. Commercial rice cultivation is partially motivated by desire to participate in the local economic boom. More important, rice cultivation demonstrates to colonists and local officials that the Aguaruna know how to "use" their land.

As pressure for land increased throughout the 1970s, colonists wondered why they could not have access to large tracts of forested land along the Carretera Marginal. In the traditional Aguaruna subsistence system most of the land is fallow or used for hunting and gathering. The forested area, effectively part of subsistence resources, appeared as unused land to the outsider interested in commercial agriculture. The Aguaruna soon felt compelled to use their holdings so that colonists would know the land was occupied. Thus, as a response to the pervasive market economy of the region,
and because of pressure from new settlers, the Aguaruna have begun rice production.

Whereas the colonists have experience cultivating irrigated rice in their homeland, the Aguaruna do not. Rice cultivation and involvement in a commercial market are unfamiliar activities for the Aguaruna. The products and processes of commercial agriculture differ from those of subsistence agriculture and introduce new concepts of land use, labor, and technology. The Aguaruna are still newcomers to the market economy.

The first evidence of commercial crop cultivation by the Mayo Aguaruna appears in a 1974 census taken by SINAMOS (Sistema Nacional de Apoyo a la Movilización Social) for titling of land (Perú-MinAg 1974). The census notes that several of the communities sold corn, but it does not list rice as a commercial crop (Table 5). While the absolute accuracy of the census is questionable, it gives some indication of total area cultivated and the amount of land per household at the time (one to two hectares). The subsistence garden crops maintained by women were undoubtedly more diverse than is indicated by the census. The Aguaruna probably sold for extra income only small surpluses of corn and products from their gardens to mestizos in the surrounding area.

Rice production now overshadows corn production in Aguaruna and in colonist areas of the Alto Mayo Valley; 49,526 mt of rice and 7,636 mt of corn were harvested in 1982 (Perú-MinAg 1983). Corn generally is used for animal feed rather than as a commercial product. A lack of marketing facilities for corn and a low price
<table>
<thead>
<tr>
<th>Village</th>
<th>Total ha cultivated</th>
<th># ha/household</th>
<th>manioc</th>
<th>plantains</th>
<th>sweet potatoes</th>
<th>peanuts</th>
<th>papaya</th>
<th>yams</th>
<th>beans</th>
<th>corn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bajo Naranjillo</td>
<td>25</td>
<td>1.9</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alto Naranjillo</td>
<td>10</td>
<td>1.5</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shampuyacu</td>
<td>18</td>
<td>1.2</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alto Mayo</td>
<td>20</td>
<td>1.7</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Dorado</td>
<td>10</td>
<td>1.0</td>
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<td></td>
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<td>x</td>
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<td></td>
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<td>corn</td>
</tr>
<tr>
<td>Morroyacu</td>
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<td>x</td>
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<td></td>
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<td></td>
<td>peanuts</td>
<td>corn</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>147</strong></td>
<td><strong>(X) 1.5</strong></td>
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<td></td>
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<td></td>
<td></td>
<td>peanuts</td>
<td>corn</td>
</tr>
</tbody>
</table>

Table 5. SINAMOS agricultural census for the Mayo Aguaruna communities, 1974.  
Source: Perú-MinAg (1974).
compared to rice limits corn production; rice brought 330 soles per kilogram and corn 215 soles per kilogram in 1983.¹

Not until rice cultivation did the Aguaruna deliberately plant a crop only for commercial purposes, a step which represents increasing Aguaruna contact with the local mestizo culture and with the national economy. When the Aguaruna were selling only small surpluses of their subsistence production, they could maintain marginal interaction with the local culture and economy. Those who now choose to cultivate rice must contract for transportation, sell rice to the national rice buying institute (ECASA), weigh rice at the mill, and accomplish the many essential efforts that accompany commercial production and export. They also must take time from traditional Aguaruna activities to plant, cultivate, and harvest the rice.

Colonization increased the impetus for commercialization in the Mayo Valley.² The Ministry of Agriculture promoted rice cultivation as it became apparent the area would be an important source of foodstuffs for the populous coastal strip of Perú. Some of the Aguaruna, particularly those leaders most involved with the local mestizo hierarchy, realized the communities must become visible participants in the new regional economy or endure persistent accusations that they should not have title to so much land. This

¹A sol (S/) is the unit of currency in Perú. Inflation and devaluation cause substantial fluctuation relative to the dollar, but in March 1983 S/1500 were worth approximately $1 (U.S.).

²Much of this section is based on Brown (1984).
thinking was communicated throughout the Mayo communities of the
and it began to influence Aguaruna economic activity. Rice became
the chief means for acquiring cash:

...[I]n 1976 approximately 45% of the large animals
hunted were sold to mestizo buyers, and the sale of
meat was the most important source of money (in Huasc-
cayacu). In 1978 the amount of meat sold was almost
nothing. The sale of rice was the source of income
in this community (Brown 1984: 105, translation mine).

The novelty of growing rice prompted cooperative production,
a method viewed by some Aguaruna as the most expedient way to initiate
commercial cultivation. Bajo Naranjillo began its rice cooperative
in 1978. Male community members were divided into four work groups,
primarily on the basis of kinship. Each group was responsible
for land clearance, planting, and harvesting of rice. The groups
harvested one to four hectares of rice per year. Organizers of
the cooperative sold the rice to mills in the nearby town of Nuevo
Cajamarca. Profit was divided among the members of each group
after expenses of marketing the rice had been met (Brown 1984:
103). Cooperative cultivation of rice, also tried in Alto Naranjillo
in 1979, continued through 1980. By 1980, however, the group effort
dissolved into individual cultivation.

Area under rice cultivation is difficult to discern for the
initial years. Brown (1984) notes rice cultivation as early as
1976 but he gives no figures for that year. The community of Shimpiyacu
produced rice on 10 hectares of land in 1977. Aguaruna in Bajo
Naranjillo cultivated 15 hectares of rice and 16 hectares of corn
in 1977, and the community of Shampuyacu had 5 hectares of rice
under cultivation (Brown 1984: 107, 137). Other communities likely
also cultivated rice at that time. By 1979 the Organización Aguaruna del Alto Mayo began keeping records of commercial crop hectarage (Table 6).

The community of Bajo Naranjillo has from the outset been more involved in commercial agriculture than the other Mayo communities. Several reasons may be attributed to its significantly greater rice production. Bajo Naranjillo has a few Aguaruna who were educated in the late 1960s and early 1970s in Rioja by a local mestizo landholder. They speak fluent Spanish and know many local Riojanos. Now as young adults in positions of influence in the community (nurse, leader of the Organizacion, and teacher) they comprise, along with the bilingual Aguaruna teachers from the Marañón, the pivot of contact with the mestizo world. Thus, most official dealings and outside contacts come through these bi-cultural leaders and hence the whole community is exposed indirectly to new ideas.

Bajo Naranjillo's location near areas of concentrated colonist settlement provides access to information about the cultivation and marketing procedures of the neighboring mestizos (Figure 11). Roads also facilitate contact. In addition to the main highway a usable feeder road cuts through the northwest part of Bajo Naranjillo. Mestizos with fields bordering the community use the road, thereby exposing the Aguaruna to all stages of commercial rice cultivation.

Perhaps the most important external influence on the community of Bajo Naranjillo is the immigration of Aguaruna from the Marañón region to the west. The incomers first came to the Mayo Valley
<table>
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</thead>
<tbody>
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<td>Bajo Naranjillo</td>
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<td>11</td>
<td>14</td>
<td>21</td>
<td>18</td>
<td>1</td>
<td>68</td>
<td>3</td>
<td>103</td>
</tr>
<tr>
<td>Alto Naranjillo</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>0</td>
<td>6</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Shampuyacu</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<td>39</td>
<td>37</td>
<td>29</td>
<td>98</td>
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1No figures available for corn hectarage in 1983.
2Does not include land cleared by tractor.

as teachers. They were followed by others who were commonly related to the teachers. The migration was in part encouraged by the Mayo natives because they wanted to increase their numbers with those whose ethnicity was similar. The majority of immigrants is concentrated in Bajo Naranjillo; about 35% of the families (24 out of 70) are of Marañon origin and they all actively cultivate rice. Immigration increased in 1981-82, thereby accounting in part for the dramatic jump in hectarage (Table 6). The overt encouragement of both bilingual Mayo natives and Marañon teachers to cultivate rice, together with their example and enthusiasm for the crop, have been factors promoting increased commercial cultivation in Bajo Naranjillo.

Other communities in the Alto Mayo Valley have not been so involved in rice cultivation. Morroyacu and San Rafael planted rice only in the last year or two. All the communities had limited hectarage, and not until 1982 and 1983 in Shampuyacu and 1983 in Dorado and Shimpiyacu did commercial rice cultivation begin to increase (Table 6). The relative isolation of the other titled areas, more attachment to the traditional Aguaruna activities, and less external influence retarded rice production in the other Mayo Aguaruna communities.

All of the communities except San Rafael were cultivating rice or corn by 1982, and in some communities crop production increased substantially between 1979 and 1981. Bajo Naranjillo led all other communities both in number of cultivators and average field size per cultivator (Table 7). Some cultivators in Bajo Naranjillo

| Number of cultivators | 33 | 6 | 15 | 2 | 14 | 7 | 14 | 17 | 0 | 108 |
| Number cultivating rice | 30 | 6 | 11 | 2 | 4 | 2 | 3 | 3 | 0 | 61 |
| Number cultivating corn | 3 | 0 | 4 | 0 | 10 | 5 | 11 | 14 | 0 | 47 |
| Mean size plot of rice (ha) | 2.3 | 1 | 1.1 | 1 | 1.1 | 1 | 1 | .66 | 0 | 1.6 |
| Mean size plot of corn (ha) | 1 | 0 | 1 | 0 | .75 | .8 | 1 | 1 | 0 | .9 |
| Total area rice (ha) | 68 | 6 | 10 | 2 | 5 | 2 | 3 | 2 | 0 | 98 |
| Total area corn (ha) | 3 | 0 | 4 | 0 | 9 | 4 | 11 | 14 | 0 | 45 |
| Total area commercial crops (ha) | 71 | 6 | 14 | 2 | 14 | 6 | 14 | 16 | 0 | 143 |
| Commercial area per cultivator | 2.15 | 1 | .93 | 1 | .86 | .86 | 1 | .94 | 0 | 1.31 |
had by 1983 plots of five, eight, and ten hectares worked chiefly with extended family help and hired labor. Rice hectarage in Bajo Naranjillo now conspicuously exceeds that devoted to subsistence crops. Subsistence production still provides the foodstuffs for families in Bajo Naranjillo, but the turn to rice production affects other aspects of land use as well as the economic character of the community.

Rice has no place in traditional Aguaruna subsistence. Therefore, rice hectarage represents the extent of commercialization in each community and indexes the degree of acculturation. As rice hectarage increases, there are accompanying cultural repercussions throughout the community. Men, now responsible for the rice crops, are considered to be agriculturalists despite the fact that agriculture has traditionally been women's work. Friction has developed in the Aguaruna communities as especially older, more traditional males, refuse to have anything to do with rice cultivation. These and other markers of change indicate the pattern of cultural transformation Aguaruna life has undergone with increased commercialization. How the Aguaruna learn and implement commercial rice production, how they acquire labor and technology, and the alteration of traditional subsistence activities all lend insight into the changes in Aguaruna life.

**Characteristics of Commercial Agriculture**

The Aguaruna now cultivate a fraction of their titled land, yet the influence of a market economy and the national culture
will soon pervade even the most isolated communities. Bajo Naranjillo exemplifies the impact of rice cultivation on native inhabitants. Cultural and economic change as recorded primarily in that community signals the transitional stage of Aguaruna society and landscape.

Land Use in the Mayo Communities

The Aguaruna presently have enough land for anyone to cultivate rice if they so desire. Enough forested land also remains for those wishing to maintain traditional subsistence activities. As Aguaruna decide to cultivate more rice, more land will need to be cleared, and existence outside a commercial economy will become increasingly difficult. The choice to clear land for rice will lead to ever greater dependence upon the cash economy for basic needs. Evidence of this progressive dependency comes from Bajo Naranjillo where the larger animals, such as collared peccary (Tayassa tajacu) and tapir (Tapirella sp.), are now rarely hunted; the protein for family needs often comes from domestic fowl or purchased cans of fish.

If any group of the Peruvian Amazon could conceivably maintain their traditional subsistence pattern because of legal claim to an adequate amount of land, it would be the Alto Mayo Aguaruna. Yet several considerations complicate and limit the choices available to those Aguaruna who wish to retain traditional ways. Once a legal boundary is put on land, the concept of land changes and land is no longer a free and unbounded good. Inasmuch as the Aguaruna are located in a dynamic colonization zone, they
will inevitably experience land pressure from mestizo settlement and expansion. Although many of the Alto Mayo Aguaruna continue to participate in social and subsistence activities that are the fabric of Aguaruna culture, the more acculturated individuals are participating in the commercial economy and the mestizo world that surrounds them. Even with adequate land resources to buffer the acculturation process, native groups still undergo stress in adapting to economic change.

Not all of the communities are equally endowed with land appropriate for agriculture, a factor that contributes to differing involvement in commercial cultivation. Bajo Naranjillo, Alto Naranjillo, and Shampuyacu encompass large areas of cultivable land (Figure 13). Most land in the other communities is either too steep or too swampy for agriculture. Rice can be grown under the less favorable conditions; land use quality does not dictate whether a community cultivates rice. It does, however, indicate potential success of Aguaruna agriculture. Communities without extensive arable land still have ample forest land. Whether the Aguaruna maintain the forest reserve or remove it for temporary, low yielding rice fields depends not only on land quality but also on the extent of influence to cultivate rice that reaches the remote communities.

Plots chosen for rice cultivation depend more on access to roads than on land quality. Rice grown any distance from a passable road must be manually brought to an access point. Communities inaccessible by road tend to have rice fields along a river or navigable creek. In Bajo Naranjillo rice fields line the two passable
ONERN Land Use Classifications

- **Good agricultural land**: can be clear cut, no limitations on drainage, slope, or soil.
- **Land considered appropriate only for pasture**: poor drainage, acidic soils.
- **Good agricultural land with limitations of poor drainage and seasonal flooding**
- **Land considered appropriately forested with selective cutting**
- **Land considered appropriate only for permanent crops because of steep slope or poor drainage**
- **Land considered inappropriate for any agriculture**: steep slopes or shallow.

Figure 13. ONERN land use categories in the Mayo communities. Source: Perú-ONERN (1982).
Method and Techniques of Rice Cultivation

The Aguaruna practice only dry rice cultivation. They open fields for rice by traditional slash and burn methods; this method was adopted by colonists when they first established rice fields in the valley. Opening a plot for rice cultivation requires initial clearing of underbrush and trees with the aid of an ax and now sometimes a chain saw. Considerable labor is required to clear land, thereby fostering family cooperation but hindering development of large rice plots. The cut vegetation is then left to dry for two to four weeks prior to burning. After large, movable trunks are removed for domestic use, the unburned rubbish is piled together and burned again.

The Mayo Aguaruna have nine chain saws, obtained from the Summer Institute of Linguistics, to use for clearing land and for timber. None of the Mayo Aguaruna are sufficiently familiar with the use of a chain saw, however, and only a few of the immigrants from the Marañon have experience with them. Consequently, the Aguaruna have hired a mestizo to operate the chain saw. The operator lives in Bajo Naranjillo and cuts timber for several of the communities. A few people in Bajo Naranjillo hire him to clear their land.

Planting is done with a digging stick made with a hard palm wood (Iriartea ventricosa or Butepe precatoria). A few Aguaruna households now use a metal rod (pico or pique) as a replacement for the digging stick (Figure 14). The palm stick is thrust into
Figure 14. Agricultural tools.
the ground and ten or fifteen rice seeds are dropped into the holes spaced about 50 centimeters.

The "Inti" and "Perla" varieties of rice, widely available locally, are commonly planted because they tolerate irregular water supply and grow well under natural soil fertility. The rice matures in five months. With the exception of Bajo Naranjillo, rice is grown among the still scattered trunks and stumps left by slash and burn clearing. Plots are small, irregular, and perhaps weeded once or twice during the growing season with a flat tipped machete (Figure 14).

Open, golden clusters of rice are harvested with a sickle and stacked in bunches. The bunches of rice stalks are laid over trunks in the field to dry in the sun. After perhaps a half hectare has been cleared and the grain has dried, threshing areas are created. A tarpaulin is spread over a portion of the field already harvested and a few logs are places atop the tarpaulin. The rice heads are then threshed against the logs and the grain gathered and put into sacks purchased from the mill. Field threshing is only moderately effective. Much of the grain is left on the stalks and wasted. Nonetheless, fields planted on alluvial soils commonly yield 2000 to 2500 kilograms per hectare. Unweeded fields, poorly cleared plots, or those on poor soils yield 1000 to 1500 kilograms per hectare.

Once the rice is harvested the plot is given over to corn or to mixed subsistence garden crops. By contrast, the mestizo colonists in the Mayo Valley grow rice two successive years on
the same plot, during which time they continue improving the field
by removing stumps and establishing irrigation canals and dikes
around fields. By the third year the plot is ready for flood irrigation
that maintains yields despite declining soil nutrients and excessive
weed growth. The Aguaruna have not yet acquired the practice of
flood irrigation of rice, nor do they use teams of oxen to pull
out stumps in preparation of the field. Some Aguaruna are considering
adopting the colonists' methods since irrigated rice yields up
to 6 tons per hectare under proper management. The lack of necessary
engineering and agricultural experience, however, as well as still
abundant land resources, hinders Aguaruna adoption of these methods.

An additional obstacle to Aguaruna productivity is their failure
to adhere to the seasonality of rice cultivation in the valley.
Ideally, rice growing occurs during two seasons (campana grande
and campana chica), which depend on precipitation and temperature
(Figure 15). The two seasons overlap and preclude the use of the
same plot for double cropping. The campana grande is associated
with highest yields for dry land cultivation and coincides with
the season of greater rainfall. Clearing and burning for the campana
chica plots commences during the harvest of the campana grande
plot and the growing season for campana chica rice occurs during
the cool season with lesser rains. Environmental constraints requiring
accommodation include the need to clear and burn during the May
through October dry season, low dry-season temperatures that harm
the maturing rice, and scheduling the harvest to avoid excess rain
and moisture damage to rice grains. Yet for the Aguaruna cultivation
is still a trial and error procedure. While larger fields are planted to coincide with optimal growing conditions, many smaller plots are at various stages of maturity throughout the year resulting in low yields from fields planted out of season.

The Labor System

The shift to commercial rice production is accompanied by increased labor demands for rice cultivation. Rice cultivation is new in the valley and to the Aguaruna, and the knowledge of production and marketing derives only from the example of the
colonists. For small plots involving one or two hectares an Aguaruna
could learn the mechanics of rice cultivation from surrounding
mestizos. An extended family of four or five males could provide
the necessary labor to prepare the field, plant, and harvest the
rice. For larger fields, however, family labor is insufficient
to accomplish all the agricultural tasks, especially field clearing
and harvesting.

Aguaruna males have no traditional system of shared labor
that would accommodate the high labor demands of commercial production. They frequently comment that they only work in family groups, yet at least five cultivators have hired either mestizo labor or young Aguaruna men for clearing or harvesting. The issue here does not concern whether the Aguaruna hire labor, however, but how they fit the hiring of labor into their system for cultivating rice.

The first survey of Aguaruna agriculture (Perú-MinAg 1974) noted that land is cultivated individually, that is, a family or extended family has responsibility for the hectarage to be cultivated. The initial Aguaruna effort at commercial agriculture was partly to show the rest of the region that they could cultivate rice. Hence the leaders in the community of Bajo Naranjillo decided a communal approach would be most effective for quickly cultivating a large area. That community organized an effort to learn about rice cultivation which coincided with the notion of cooperative involvement in commercial agriculture. Yet as production increased in Bajo Naranjillo, the group effort expired and cultivators assumed the marketing responsibility of their own product; family labor
evolved to be the chief means for production on individually managed plots of land.

An effort to preserve the image of communally organized rice production remains. Aguaruna holding official positions in the community adamantly state that rice is cultivated by work groups and they minimize the role of the individual. At the same time, an agriculturalist, proud of his efforts and less concerned with public image, gladly talks about his five hectares of recently planted rice. This conflict has become more apparent as the community of Bajo Naranjillo increasingly involves itself in rice cultivation.

Aguaruna families do not have enough internal labor to work the five, eight, and ten hectare plots that are now being cultivated in Bajo Naranjillo. The large increase in area under cultivation occurred between 1982 and 1983. Prior to that hectarage increase came from a large number of cultivators working small plots of one to three hectares. After 1982 a few members of the community expanded their hectarage considerably; in one case 14 hectares were under cultivation and involved several adult males of one family working together. The significant increases in area under cultivation indicate that several families were experimenting with rice cultivation and they had to cope with the realities of labor shortage and drop the idealistic notions of how the Aguaruna should cultivate rice.

While the majority of rice cultivation still occurs on one to two hectare plots worked by family labor, some Aguaruna in Bajo Naranjilo have begun to hire other men in the community or local
mestizos to work their fields. Salaried teachers are able to hire workers and they all are Aguaruna immigrants from the Marañon Valley.

The teachers are also adept in the dealings with the mestizo world and at least one of them received a loan from the Agrarian bank (BAP) to cultivate 30 hectares; he then invited a group of relatives from the Marañon to come to the Mayo Valley and to help them clear for the campaña grande planting. Fourteen relatives stayed for a month and, together with hired mestizos and the chainsaw operator, they cleared 22 hectares but planted ten. Family, paid community members, and hired mestizos harvested the crop. Four adult brothers of another family and relatives cleared and planted fourteen hectares in late 1982. Mestizos were again hired to clear, plant, and harvest the crop. To harvest and thresh one hectare of rice requires 40 man days and to harvest 14 hectares would occupy ten people for nearly three months. It is difficult to assemble ten willing family laborers and no less difficult to sustain that labor for the time needed to harvest a large area.

In their enthusiasm some Aguaruna have planted rice fields too large to harvest. They have planted their crop to coincide with the rains of the campaña grande, as have the majority of colonists in the area. A severe labor shortage occurs during harvest time, a shortage partially filled by seasonal mestizo migrants from the coast. The Aguaruna are not tied into migratory seasonal labor as are the colonists and hence they have to rely on day labor of mestizos from the nearby village of Naranjillo. As a result many fields are unharvested well after the rice has matured and
the rice thus suffers damage from lodging.

Some conflict has arisen among the Aguaruna over how to meet the labor demands of intensive agriculture. The conflict stems from differences between an ideal image of cooperative production and the realities of commercial rice cultivation. For small plots of one or two hectares, labor is furnished by an extended family which benefits from the sale of rice. For larger commercial plots, it is understood that labor will be paid, even if it comes from the community. Only Bajo Naranjillo has thus far cultivated large fields of rice and hired outside labor. Other communities manage labor needs for rice production by use of family members.

Storage, Marketing, and Transportation

Harvested and bagged rice contains considerable unripe grain, damp chaff, and debris from the threshing process. The Aguaruna do not normally winnow and sun-dry their rice as do many colonists. In the interval between harvesting and transport to the mills, the Aguaruna store the 50 to 70 kilogram sacks of rice in their homes or in temporary shelters in the fields. In no case are the sacks protected from dampness and pest damage. Consequently, the harvested and bagged rice receives a discounted price at the mill. Mill operators discount up to 15% from the 330 soles per kilogram price (March, 1983).

The Aguaruna must contract mestizo truck drivers to transport their rice; the fees are fixed by a local union. As with labor demand, the demand for trucker's services increases greatly during
harvest. The cost of transporting rice doubled in a single year (1982), from 500 to 1000 soles per sack, chiefly as a result of inflation.

Although seven mills are located throughout the Mayo Valley, difficulties with transportation lead many Aguaruna to sell their rice to intermediaries (for 250–270 soles per kilogram) to avoid the cost and effort of transport. Thus, residents of Shimpiyacu, Morroyacu, and San Rafael sell rice at Puerto Tahuisco in Moyobamba. Likewise, rice cultivators in Dorado and Huascayacu sell their product at the port of San Fernando rather than hire a truck for transport to the mill in Nuevo Cajamarca.  

Aguaruna who arrange their own transportation and sell directly to the mill, mainly cultivators from Bajo Naranjillo, have other problems. During peak harvest, bottlenecks occur at the mill. Agriculturalists wait with their rice, sometimes for several days, until the rice is weighed. They receive a voucher for its value, redeemable at ECASA (Empresa Comercializadora de Arroz y de Servicios Agropecuarios), the national rice buying bureau. ECASA frequently runs out of money and the agriculturalists wait two months and more to receive payment for their rice. For those with loans or workers to pay such delays pose severe economic problems.

By mid-1983 another factor complicated rice marketing in the Mayo Valley. ECASA had failed to make the necessary arrangements for transport of rice from the valley and the nearby province of

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3See Chapter 2, Figure 11, for a map of location and access of the Mayo Aguaruna communities.
Bagua to the coast. As a result, all seven mills in the Alto Mayo Valley were stacked to the roof beams with rice, no sacks were available for the still ripening grain, and an estimated 10,000 metric tons of rice were damaged in the department of San Martin (El Comercio 1983).

Other Commercial Activities

Very few commercial activities other than rice cultivation occur in the Aguaruna communities. Those present are small scale with little impact on the landscape or economy. One man in Bajo Naranjillo raises cattle. Some hardwood timber, palmwood, and thatch is taken from the forest and sold locally. Otherwise only corn, coffee, and plaintains offer possible, but unstable, prospects for commercialization.

Aguaruna leaders aspire to get out of an exclusive orientation towards rice cultivation but any Aguaruna involvement in commercial agriculture is directed by the vagaries of the national market. In some instances innovative mestizo agriculturalists have broken the rice pattern that dominates the valley, but usually because they have the influence and connections necessary to control their own market. The Aguaruna are considering commercial fruit production, already successful in the selva central to the south, and commercialization of peanuts (Arachis hypogea), a crop already cultivated in women's gardens. This is tentative, however, and depends on the Aguaruna mastering the commercialization process.
Bajo Naranjillo Plans for Mechanized Rice: The 'Empresa Comunal'

Until recently rice cultivation did not dramatically affect technological aspects of Aguaruna life. The influence of increased communication in the zone brought the Aguaruna into contact with cars, radios, and television, but the technology of everyday life did not change. Even the introduction of commercial rice cultivation did not greatly alter agricultural tools and technology. A major change in technological orientation occurred in 1982, however, as the community of Bajo Naranjillo negotiated a loan for 128 million soles (about 183,000 US dollars in September, 1982) from the Banco Agrario de Perú (BAP) to buy a tractor and begin mechanized, irrigated rice cultivation.

The loan and tractor project (the empresa comunai or community enterprise) was conceived as a community project involving only Bajo Naranjillo. Officials of the central political organization for all the Mayo Aguaruna (OAAM) were involved in negotiating for the loan but the empresa was to be an experiment in Bajo Naranjillo and only extended to other communities if successful. The plan included clearing 50 hectares the first year and 50 hectares a year for the following five years. The completed project was to comprise 300 hectares of irrigated rice within six years. It was a communal enterprise in that all profits from growing rice would be reinvested in community projects or spent for the community good; profits would not be divided among individuals. Any work put into the project by community members was entirely voluntary, but it was assumed that most people would work. Initially the
managerial and technological details would be assumed by mestizos. They would train Aguaruna to take over their positions of tractor driver, hydraulic engineer, and business administrator.

Aguaruna leaders convinced the community that the empresa was beneficial. It would make profits to build new school rooms, health facilities, and roads in the community, to buy a truck or trucks for communal use, and to send their children to school in Lima on scholarships so that they could become part of the professional world of Peru. If the community approved the project an envisioned harvest worth 30,000,000 soles at the end of the next campana grande would transform the community and make it an example to native communities in all of Perú. Unrecognized in this scheme was the still enormous amount of manual labor needed in addition to the tractor and the demand for efficient management and technological understanding.

The loan was approved in September 1982 and the tractor (made by CASE) was to arrive in early October to begin clearing in time to plant in the campana grande. Studies completed prior to loan approval determined feasibility for irrigation and land use (Perú-BAP 1982). The land identified for clearance was about one kilometer from the main settlement of Bajo Naranjillo. While waiting for the tractor to arrive the Aguaruna hired an engineer to oversee the building of a canal. The canal was designed to obtain water from the Naranjillo River and drain the excess into a creek running through the community.

The first evidence of trouble with the tractor project appeared
at the time to install the irrigation canal. No one in the community was willing to work and mestizo day laborers were hired at a cost of over one million soles. Ten mestizos worked for a month digging the 2.7 km canal. The comuneros (community members) refused to participate in the manual drudgery of digging a canal. Not only was it an alien concept of how time should be spent, but the Mayo natives thought they had done enough by approving use of community lands for the project. They did not feel responsible for establishing the necessary infrastructure.

The additional labor problems inherent in planting and harvesting 50 hectares a year, tasks that are done by hand despite mechanized clearing, were not recognized in the enthusiastic planning stages of the project. If all able bodied heads of households in the community of Bajo Naranjillo worked consistently for two weeks planting and for two months harvesting, the first 50 hectares could be cultivated with communal labor. Labor requirements for the 50 hectares to be added each successive year would have to come from outside the community.

The tractor arrived in January, 1983, after ten hectares had been cleared by two small tractors on loan from the CASE tractor representative. At that time official administrative responsibilities were given to a local mestizo designated by the bank. His official liaison with the community was the Aguaruna apu or titular head of Bajo Naranjillo, not the Aguaruna teachers or de facto leaders more accustomed to dealing with the mestizo world. The bank's control over the project reflects in the appointment of a mestizo
administrator. The Aguaruna's desire to have a truly communal project is apparent in the naming of a Mayo Valley native to represent the community.

The tractor, operated by a mestizo, continued clearing the forest. A larger version of the two front-blade tractors previously in operation, the machine knocked over trees, scraped debris, and piled it along borders of the cleared areas. The tractor cleared another 10 hectares before the motor broke down in February, 1983. No one in the Alto Mayo Valley or in Tarapoto could provide service for CASE tractors. The motor had to be removed and sent to Lima for repair.

Disenchantment with the project pervaded the community. The Aguaruna were dissatisfied with the manager hired by the bank; they fired him and began to seek an outside expert they thought more trustworthy. They discovered that the canal was too small to irrigate 300 hectares and that it would have to be enlarged and relocated. The labor input of community members was still an unsettled issue. The bank initiated the repayment schedule. The 20 hectares of cleared land reverted to secondary growth; no one attempted to plant dry rice. The Aguaruna did not talk about the tractor or what would happen.

In July, 1983, the motor was returned from Lima, supposedly repaired, yet a month later the community was still waiting for a mechanic from Tarapoto to install it. Community attitude once again became positive with the return of the motor. The community held meetings in Bajo Naranjillo to decide how to approach the
empresa in the future. They hired a new manager, decided to cut large trees with a chain saw to minimize tractor work load, resolved to plant any cleared areas in dry rice until the canals were functioning, and established that anyone who worked for the empresa could use the tractor to clear their own land.

Bajo Naranjillo's positive approach to the next phase of involvement with the tractor is fortunate: they are committed to a large debt to the BAP regardless. They attempted to cancel the loan in December, 1982, on the basis of the long delay in the tractor delivery, however, there was no legal foundation for rejecting the loan. The Aguaruna must pay back the 128 million sole loan, plus an additional 74 million sole extension they received in May, 1983. The second loan was necessary because all of the original loan had been spent for the tractor (104,000,000 SO/), wages, and salaries.

The Aguaruna of Bajo Naranjillo have a 202,000,000 sole loan with 35% interest to repay over ten years, a tractor, and the intent to cultivate a large area of irrigated rice. The attempt to bridge a technological barrier by acquiring the symbols of mechanized cultivation backfired when confronted with a variety of financial and technological obstacles.

The empresa comunai of Bajo Naranjillo is one of the more extreme manifestations of the transition from subsistence to commercial agriculture for any indigenous group in Amazonia. The impact on the landscape strikingly reflects the Aguaruna's perceived need to cultivate rice. Some of the Aguaruna feel the only way to compete
with the colonists, and thus secure claim to their land, is to begin irrigated rice cultivation. This marks a significant departure from traditional cultivation practices and a technological transition of great proportion. While the Aguaruna possess vast knowledge of their natural environment, their knowledge does not extend to the maintenance of a structured, artificial agro-ecosystem, nor to the operation and maintenance of the machinery necessary to establish irrigated rice fields. Immediate problems the community experiences with the empresa are overshadowed in the long run by another factor. The Aguaruna of Bajo Naranjillo are committed to a project entailing a significant gap in knowledge and technology between that of traditional Aguaruna life and that represented by a landscape of irrigated rice fields.

What could happen to Aguaruna land if they default on the loan? An agrarian law passed in 1980 (Perú-Law No. 2) established the right of banks to take property in exchange for nonpayment of loans. The law which created the native communities is still in effect, however, and prevents seizure of native lands. More likely, in the case of a complete collapse of Aguaruna involvement in the empresa, the Banco Agrario del Peru would take over the use of the land for an indefinite time, a circumstance also likely to have a profound effect on Aguaruna life in Bajo Naranjillo.
The most obvious change in Aguaruna life during the last several years is the involvement in commercial agriculture. The degree of participation in rice cultivation varies from community to community, but the repercussions of agricultural change reach all the Aguaruna. Agricultural activity outside of rice production, reflects the alteration of traditional economic and cultural patterns. Modification of land use, attitudes toward land, male and female work roles, crop composition in subsistence gardens, and alteration in the forest environment of Aguaruna settlements result from change in agricultural focus.

Subsistence and Wellbeing

In some respects traditional subsistence among the Aguaruna has not changed because of rice cultivation. In the Mayo communities, and even in Bajo Naranjillo, women still provide the bulk of foodstuffs; their contribution to the Aguaruna diet remains the same. Until women are drawn into the commercial process, subsistence activities of women are unlikely to change drastically. The continuance of traditional subsistence activities
indicates that knowledge and duty residing with the female prove resistant to outside influence.

Transfer of male activity from hunting to commercial agriculture has the greatest effect on subsistence. Hunting is becoming, as it is among mestizos, an activity that accompanies agricultural work. Specialized hunting trips, an intimate part of maleness and the acquisition of status in Aguaruna society, are less frequent. It is now more common to see a man working in a rice field with his rifle near by. Thus an integral part of Aguaruna subsistence and its meaning in society are affected by commercial rice cultivation.

Increased involvement in rice cultivation provides money for market purchases. Money is spent primarily on material comforts rather than on non-traditional foodstuffs; however, some Aguaruna families now purchase sugar, cooking oil, onions, noodles, canned tuna or sardines, oatmeal, and salt from the mestizo market. The Aguaruna raise sugar cane as a snack food, not for refining; they buy purchased, refined sugar to sweeten children's food and hot drinks. The introduction of aluminum pots and skillets has changed traditional cooking techniques and foodstuffs. Eggs, tuna with onions, and now even manioc are fried with vegetable oil. Noodles are cooked in soups. Oatmeal, called "Quaker", has become a common food among some Aguaruna families. It is cooked as a thin gruel, sweetened slightly with sugar, and served as a drink for breakfast and evening meals. Rice consumption is not yet widespread in Aguaruna households, but the families that include rice in the diet generally buy it from the market rather than reserve it from their harvest.
The Aguaruna cook their food without salt although salt is now served as a condiment. Salt domes in the Alto Mayo Valley provide a source for the Aguaruna to reduce salt from saline streams, or they buy 20 kilogram bundles from mestizo salt processing camps. Bagged salt is also available in the local markets where many Aguaruna now buy it as one of their market purchases.

In some communities a teacher or a bilingual keeps basic items to sell, including kerosene, matches, soda pop, batteries, gum, and crackers. Both profits and turnover are low in these small stores.

Any major purchases require a trip to one of the local markets. The Saturday market at Puerto Tahuisco and the Sunday market in Nuevo Cajamarca are main destinations for Aguaruna who want goods from the cash market (Figure 11). The Aguaruna buy kerosene for homemade lanterns, shoes, bar soap for washing clothes, pots, blankets, shotgun shells, and clothes or yard goods. Such items affect wellbeing, not food acquisition and consumption, yet they represent the incipient involvement in a market economy.

Women and Men in Contemporary Aguaruna Agriculture

Commercial agriculture has affected traditional sex-based work roles among the Aguaruna. While women are still responsible for maintaining and harvesting subsistence crops, they will on

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1 There are several salt springs in the Alto Mayo Valley and an exposed salt dome cut by the Huallaga River below Tarapoto. In the Mayo Valley there are two domes with salt springs near the native community of Dorado, a spring southwest of Rioja, and one in the Gera River Valley south of Moyobamba (Perú-ONERN 1982).
occasion plant and harvest rice fields of less than a hectare. In commercial cultivation of large fields, women rarely participate; men, exclusively, cultivate the large areas of commercial rice.

Commercialization entails direct contact with local mestizos, a factor contributing to male involvement in activities outside the Aguaruna communities and particularly in rice marketing. The public and business sectors of the Alto Mayo Valley, as in all Perú, are male dominated and more receptive to Aguaruna men than they are to women. Notwithstanding the physical labor required to move rice sacks to an access point, the arrangements for a truck to pick up the rice and the negotiations at the rice mill are chores more easily accomplished by men.

Alteration of traditional work roles affects women's status in Aguaruna society and it has implications for their interaction outside the communities. As Stocks (1984) observed, the value of women's goods, within their society and in the national culture, is a factor in adaptation. Aguaruna women in the Mayo Valley are still attached to their traditional tasks of food cultivation and preparation. These activities are critical to the wellbeing of the group but offer no source of income and no contact with the changes occurring in their social and physical environment. Women do not participate in activities of the commercial economy, nor do they produce items of value in a cash market. While they maintain control and respect within Aguaruna society, the unequal exposure to the outside world between males and females, based largely on the division of labor in rice cultivation, hinders women's adjustment
An indication of role changes resulting from modification of agricultural practices was apparent in the first census taken in the Aguaruna communities (Perú-MinAg 1974). Despite women's superior knowledge of horticultural techniques, the census followed a mestizo model in designating occupations; men were listed as *agricultores* (agriculturalists) and women as *su casa* (loosely: housewife). The pattern continued in later censuses regardless of whether or not males cultivated rice fields.

### Changes in Attitudes Toward Land

The Aguaruna occupy large titled areas in a zone where demand is high for good land. They do not have to struggle to acquire a place to live, still a major problem for many native groups in Amazonia, but they do have to maintain their right to the land. There is no immediate threat, but there are frequent harassments from colonists and local officials who value the land resources of the communities. Since the traditional Aguaruna pattern of land use does not include large, cleared fields, mestizos conclude that the Aguaruna do not know how to cultivate.

As a result of the colonist influence, the Aguaruna are now confronted with different ideas about how land can and should be used. Many Aguaruna have imitated the land clearing and cultivation customs of the colonists, which is the first step toward considering land, rather than forest, as the primary resource.

Prior to community titling and the advent of commercial
rice few problems occurred concerning how much land was cultivated or where land would be cleared. The Aguaruna would recognize that a certain woman planted and tended an area for her manioc garden, but there was no legal or monetary commitment. The forest remained an important source of food and materials. Once a garden was abandoned, the forest regenerated, and the area was again available for use by anyone in the community. Area under cultivation at one time was never so much that the Aguaruna felt their subsistence base was threatened.

Aguaruna rice cultivators now clearing large areas in Bajo Naranjillo are a source of friction in that community. Especially the native Mayo Aguaruna feel too much forest is being cleared for commercial agriculture. More important, they feel that in some instances the cleared land is acquiring characteristics of private property. This concern prompted a decision nominally to divide community property into 50 hectare plots for each head of household. The decision was part of a land use plan whereby half the 6,442 hectares of Bajo Naranjillo would be designated for cultivation, half left in forest. The 3,000 hectares for cultivation would include the land for the empresa as well as the 50 hectare plots for each head of household. The result of community unrest over increased clearing is a transformation of the Aguaruna principle of community land to include individual property.

In other communities rice production remains small scale with little tension over access to land. Events in Bajo Naranjillo, however, represent the experience of reorientation toward land
and forest resources that is likely to occur throughout the Aguaruna communities as area under cultivation increases.

The Changing Concept of Agriculture

While there has been no noticeable decrease in the attention or area devoted to manioc gardens, now added to the agricultural landscape are fields of rice tended by men. There are also incipient changes in the kinds of plants cultivated in the women's outfield gardens. The immediate house gardens do not yet show signs of changing.

One variation on the outfield yucal (manioc garden) includes mixed cropping of manioc and corn. Corn lends itself to cultivation in mixed gardens more readily than does rice. The two crops are planted simultaneously and the corn is harvested before the manioc tubers fully develop.

Some women have planted rice in their manioc gardens. The rice often does not mature; it is choked by weeds before harvesting. What rice does mature is scant and used as chicken feed rather than for home consumption. Planting rice in manioc gardens coincides with the traditional use of gardens as an area of experimentation with new plants; it exemplifies adaptation and change in an indigenous agricultural system.

Signs of overlap between men's and women's activities in agriculture, blending traditional and commercial cultivation, occur in large plots of one or more hectares now evident in some of the communities. These fields, worked with family labor, include both
grain crops and traditional subsistence crops. Corn and rice are planted in plots within the garden so that the grains mature and are easily harvested. The surrounding manioc and plantains remain to form a subsistence garden. Men and women working together in mixed agriculture, mixed in the sense both of plant composition and economic orientation, presents an aspect of change in the Aguaruna notion of agriculture. More important, this kind of mixed agriculture provides a basis for integrating commercial cultivation into a traditional Aguaruna pattern.

Field succession offers another indicator of transition in agriculture. Women now occasionally plant manioc, other tubers, and corn in fields from which commercial rice has been harvested. The practice enables them to take advantage of already cleared areas. This type of field succession only recently appeared in Bajo Naranjillo and it is not yet clear if yields from manioc gardens on previously planted land are equal to yields on new clearings. Similarly, a man in Bajo Naranjillo planted pasture grass (*Brachilaria sp.*) in his wife's yucal; he intended to transplant the manioc to a recently cleared rice field, and then convert the garden to pasture. However, weeding and tending of manioc are activities performed by women. As a consequence, the grass was soon as high as the manioc yet the manioc was not transplanted nor were cows available to put in the pasture. Such conflicts between traditional values and roles and the incoming notions associated with commercial production of crops are likely to increase with time.

New types of gardens have also appeared in which cultivation
occurs for reasons other than home consumption. Gardens are now cultivated by students under the direction of Aguaruna teachers. Male and female students clear plots and plant gardens of corn, manioc, plantains, and rice. The harvest provides food for students while they are in school or it brings cash to buy school supplies. The teachers consider it important to preserve the notion of traditional agriculture and to introduce commercial cultivation; they feel they are "teaching" agriculture in addition to promoting a financial endeavor for the students.

One community project in 1982 encouraged women to work together to cultivate exotic vegetable crops such as cabbage, beets, carrots, and radishes for local consumption and sale. The experimental garden project, encouraged by a Lima-based native support group, did not succeed. The Aguaruna could not adjust to eating vegetables, despite the fact that some were tubers. There was no market demand for vegetables even in the mestizo areas of the region. A final reason for its failure was social. Although small groups of women frequently garden together, the idea of all the women in the community working together, outside the manioc gardens where cooperative effort has traditionally occurred, was socially unacceptable and domestically disruptive.

Rice cultivation is an important and obvious marker of change, but there are many aspects of traditional Aguaruna life that remain unaltered. How change becomes reflected in the traditional facets of Aguaruna culture expresses the beginning of integration into a new system. The basic pattern of Aguaruna agriculture shows
signs of changing and with it other aspects of Aguaruna life and culture will change. The experimentation with new ideas, new crops, and new patterns of cultivation—some rejected, some accepted—illustrates the development of agricultural alternatives. It is important to look beyond the obvious manifestations of change. The alteration in daily work patterns and activities has perhaps more significance in overall adaptation than the degree of involvement in commercial activity per se. Altered work habits also offer insight into how native cultures confront a different system of production.
VI
EFFECTS ON THE LANDSCAPE: CHANGES IN SPATIAL
ORDER AND MATERIAL CULTURE

Economic development and a changing attitude toward environment become manifest in material culture objects and spatial order of Aguaruna communities. The landscape of commercial agriculture differs visually from that of subsistence cultivation. Economic change is reflected in such material things as clothes, cookware, building supplies, gadgets, and radios. It is no less evident in the order of things: where houses and buildings are located and how they are arranged.

Settlement

Bilingual schools established in 1972 provided foci for settlement. Titled communities did not exist at that time and Aguaruna house compounds were dispersed in the forest. Establishment of eight schools in Aguaruna territory did not cause an immediate reorientation of settlement; more than 10 years later houses are still scattered and children walk up to three kilometers to go to school. Villages having all members of the community in one place do not yet exist. Nevertheless, there is an increasing tendency toward clustering of houses and the formation of distinct settlements,
either in a central or peripheral location of the titled community land. While some people relocate to be nearer to schools and communication, others avoid the bustle of community centers and remain in their forest surroundings.

Increasing contacts with the local mestizo population and with the larger national culture also contribute to change in Aguaruna settlement. Aguaruna settlements are evolving with the school and soccer field at the center and houses surrounding those core elements (Figure 16). The open space or soccer field, introduced

Figure 16. Centralized settlement in Dorado.
when schools were built, resembles the open central space in Spanish-Peruvian settlements. The fields accommodate the Latin American custom of spontaneous soccer games, the physical exercise sessions for school children, and the special occasions of the community. Their presence, however, primarily serves as a symbol of conformity and represents acceptance of the Peruvian village pattern.

Some communities such as Shimpiyacu have relocated to riverside sites to facilitate communication and transportation with the economic world beyond. Houses formerly in the interior of the community area are now clustered around an open space a short distance from the river (Figure 17). Paths connect homes located farther inland or upriver.

In Bajo Naranjillo four settlements occur around the periphery of the territory: Naranjillo, Cano Hondo, Unguyaku, and Soritor (Figure 18). Cano Hondo in its layout and function most resembles the emerging Aguaruna model. It contains the office of QAAM (Organización Aguaruna Alto Mayo), a health post, a school office, five school rooms, housing for live-in students and nine houses (Figure 19). The decision to relocate that settlement near the main road resulted from increased contact between Aguaruna and mestizos.

The other settlement clusters in Bajo Naranjillo have no service functions and they largely retain the pattern of dispersed house compounds. The impact of outside influence, however, affects them all. Naranjillo lies in the direction of expansion of agricultural lands being cleared mechanically and manually; agricultural land will soon surround the enclaves of forest and houses. Unguyaku
Figure 17. Settlement relocation in Shimpiyacu.
Figure 18. Population centers in Bajo Naranjillo.

Figure 19. Community layout in Cano Hondo, Bajo Naranjillo.
borders the Carretera Marginal. Increased clearing along the road leaves houses there exposed to the traffic and dust of the highway. The Soritor settlement, comprised of seventeen immigrant families from the Maranon region, overlooks the rice fields and mestizo homes of San Juan to the south.

Fixed places and their structures are evidences of change among the Aguaruna. Traditional Aguaruna buildings and settlements give an impression of impermanence. Yet a trend toward permanence in villages accompanies the social and economic transformations now influencing Aguaruna life and livelihood. A brick health post in Bajo Naranjillo, lumber siding and tin roofs on some houses, a tin roofed school in Shimpiyacu, cleared open spaces in the communities, and change in land use surrounding settlements, are alterations in Aguaruna conception of space and place. An identifiable place serving the demands for interaction with the mestizo society and containing the symbols of health and education highly valued by a non-Aguaruna world is most conspicuously represented in Bajo Naranjillo.

Material Culture

Houses

House design and materials also reveal change in Aguaruna life. Many new houses are rectangular rather than oval. The rectangular shape reflects adaptation to new conditions; thatch is now relatively scarce as is the time needed to gather thatch and to construct rounded ends. Some people now construct houses
with a rounded thatch roof line on one end, and a flat, open end on the other.

House interiors exhibit outside influence and spatial reorientation. The large oval buildings of Aguaruna tradition, completely open inside, had beds placed around the sides and an area set aside, usually at one end, for cooking and sitting. This design still exists in the Mayo communities but now commonly homes have palm-wood dividers demarcating sleeping and eating areas (Figure 20). Interior house design reflects changes in awareness of the need to separate people and activities within the house, perhaps because of increasing contact with visitors other than family and from whom one seeks privacy.

Houses, for the most part, still consist of palm wood and thatch lashed together with vines and bark strips. Five exceptions to this have been built since 1981. Four houses in Bajo Naranjillo

Figure 20. New style house in Bajo Naranjillo.
are made of red cedar (*Cedrela odorata*) plank walls with a raised floor and a corrugated tin roof. A new house in Shimpiyacu combines old and new styles. It has a raised floor of split palm wood, walls of split palm-wood and wild cane (*Gynerium sagitatum*), and a tin roof.

All of the non-traditional houses belong to teachers who immigrated from the Marañon Valley. While the Marañon immigrants bring with them a broader vision of the outside world than that of the traditional Mayo native, they have other reasons for constructing lumber and tin houses. Teachers receive a salary from the Ministry of Education and also likely cultivate rice, thus giving them additional income to purchase tin roofing material and hire the labor for splitting wooden boards. Most of the teachers, and particularly those constructing new houses, have been in the Mayo Valley five to ten years. Only in the last two years have the more acculturated teachers constructed houses that architecturally and symbolically separate them from their native Aguaruna tradition.

**Artifacts**

Aguaruna in the Mayo Valley have engaged in trade for several decades. Work exchange for local mestizos and the sale of animal skins and smoked meat provided some money for cloth, clothing, metal cookware, and machetes. These items are basic in Aguaruna homes. The number and kind of mestizo artifacts in households are changing, however, and with increasing income such items as lanterns, radios, and outboard motors are purchased. Such acquisitions
generally indicate a degree of integration into the monetary system of the country as well as a level of acculturation into the mestizo world.

Change in household items affects the pattern of everyday life. Enamel plates have replaced ceramic bowls as eating vessels and aluminum pots supplant earthen bowls for cooking. Large red and buff ceramic vessels for fermenting masato and small clay serving bowls are yet present in Mayo Aguaruna homes; in a few houses women make and store masato in aluminum pots. Some Aguaruna teachers have purchased chairs, tables, and beds made by a local mestizo carpenter.

Some Aguaruna now buy more costly items such as radios and lanterns. Radios are often the first major purchase. Although most Aguaruna cannot understand Spanish, they enjoy the music and they understand broadcasts from Ecuador in Shuar, another Jivaroan language. The contact satisfies curiosity about the outside world. It serves as a welcome diversion and a means for the introduction of new ideas into the community. Lanterns and radios restructure time and alter daily routine.

Some purchases represent considerable investment and a marked change from traditional Aguaruna life. Two teachers have 40 horsepower outboard motors (they previously had 16 horsepower peki-peki motors), thus reducing travel time by half from the communities along the Huascayacu River to the port of Moyobamba. One family has purchased a refrigerator and a television that are run by a portable generator; children living nearby make nightly visits to watch the programs.
from Lima.

Increased availability of money, altered use of leisure time, and rapid transformation of material culture underscore the effects of change among the Aguaruna. Perhaps the dramatic shift in material culture is most vividly depicted by the frequently heard mestizo comment that the Aguaruna are now *civilizado* (civilized), a comment directed largely to the fact that the Aguaruna now wear Western clothes.

**Routes and Movements**

With increased economic activity the Aguaruna leave their communities more often and travel greater distances to towns and markets. Men go to a nearby town to sell rice or buy medicine, and families window-shop in the brightly lit stores of Moyobamba. Children, women, and young men walk along the Carretera Marginal to hail a truck for the dusty ride to the next Aguaruna settlement.

Almost daily trips outside the community have become a matter of course for those primarily involved in business concerning the tractor and loan. Occasional trips are made to Lima, Pucallpa, or Chiclayo. Some of the teachers return to the Marañon region to visit their families during the school break from mid-December to March. A few families from Shimpiyacu, San Rafael, and Morroyacu regularly travel to Moyobamba on Saturdays, and return on Sunday or Monday. They buy supplies, sell things from the community, and visit. For the majority of Aguaruna, however, occasional trips to market and journeys to visit friends and family in other settlements
are common.

The communities of Bajo Naranjillo, Alto Naranjillo, and Shampuyacu have the greatest interaction. They are within walking distance of each other and school children walk daily to the upper grade school facilities in Bajo Naranjillo. Aguaruna now often take the Carretera Marginal to the Cano Hondo settlement; previously they used forest paths.

The routes and movements among the communities result in contact with the mestizo culture and landscape and an awareness of things outside the Aguaruna realm. Young men look in on dances in Nuevo Cajamarca and Moyobamba, then imitate the rhythms and movements of the local dance styles at their own fiestas. Aguaruna from the Huascayacu River communities comment on the different house types, dooryard plants, and field patterns observed on their weekly trip to town through mestizo settlements. Mestizo families travelling the roads with their possessions also give the Aguaruna glimpses of other ways and material goods. The Aguaruna experience change in the Alto Mayo Valley not merely in cultivating rice, but also as they travel and observe new phenomena.

Change in the Aguaruna Environment

Cultivation of a commercial crop is the major influence changing the Aguaruna environment. It affects location, area, plant composition, and succession of fields. Cultivated land no longer consists solely of house and outfield gardens, which imitate the tropical forests in structure and species diversity. Large fields monocropped with
rice are now common in Bajo Naranjillo. Secondary vegetation of weeds and shrubs is conspicuous on former rice fields. Abandoned gardens, on the other hand, have fruit trees and bushes that make them difficult to distinguish from tended gardens.

Approximately 20,000 hectares have been cleared for rice production in the Alto Mayo Valley in the last 10 years (Peru–PEAM 1982), and those areas sharply contrast with the forested expanses in the native communities along the Carretera Marginal. Patches of cleared land are appearing along the road, however, as fields are cut and burned by the Aguaruna.

Clearing around houses and settlements is perhaps the most conspicuous change in the physical landscape. Houses, formerly surrounded by house gardens, forest, and scattered outfield gardens now have fields of rice, land being cleared for rice production, or secondary vegetative growth beyond the house gardens. Forest reduction is likely to increase in the future: less than 2% of the land of Bajo Naranjillo is cleared (123 hectares), 83% (108 hectares) of which was cleared between 1981 and 1983 (OAAM 1982).¹ Air photographs in 1978 of Bajo Naranjillo show only scattered clearings in the forest surrounding a cleared area for the new school buildings (Perú–SAN 1978). By 1983 there was a five-fold increase in area cleared for commercial purposes; an extensive cleared area of fields and secondary vegetation surrounded Aguaruna

¹Figure includes 103 hectares of manually cleared commercial land and 20 hectares cleared by tractor as of 1983. Hectarage of garden plots is not included.
houses (Perú-MinAg 1974; OAAM 1981) (Figure 21).²

![Figure 21. Land clearing in Bajo Naranjillo, 1978-1983.](image)

Water supply for the Aguaruna communities has come from streams or rivers in the vicinity of settlements. In the May to October dry season many streams cease flowing and families must seek other sources of water for cooking, bathing, and washing. The problem of dry season water supply increases with additional demand for water, contamination of water supply, and competition for irrigation water, problems now troubling Bajo Naranjillo with the greatest population of all the Aguaruna communities.

Clearing of vegetation by colonists and the use of streams

and the Naranjillo River for irrigation contribute to the degradation of water supply in Bajo Naranjillo. Colonists drain excess irrigation water from fields into streams that flow through the community areas. More critical for water quality in Bajo Naranjillo will be the *empresa comunal* plan to drain irrigation water into the Cano Hondo stream just upstream from several users.

A byproduct of economic development that affects the landscape is the accumulated trash around some house compounds. Old batteries, tin cans, paper and plastic are commonly discarded around the house, and often trash is thrown into streams, thereby aggravating problems of water pollution.

Clustering of settlement contributes to water and waste problems as well as to intensification of localized deforestation. The communities have discussed centralizing houses to facilitate school access for the children. A move of this kind would be difficult without an abundant and regular source of water to supply the community; it would also mean the eventual complete removal of Aguaruna homes from a forest environment.

Changes in material culture, house design, and settlement have touched the lives of even the most traditional segments of Aguaruna society. As communities acquire the urban functions of schools, meeting places, and health posts, they become arenas of social interaction for activities which differ from those of traditional Aguaruna life. Settlements now concentrate contact with people outside of Aguaruna society, and thus they are focal points of change.
Changing social relations among the Aguaruna result from modification in the agricultural system, but equally they affect agricultural patterns. Social components of agricultural change are evident in the current political organization of the Mayo communities, the influence of Aguaruna immigrants from the Maranon area, interaction with colonists, the impact of teachers and education, family relations, and the influence of regional, national and international organizations.

Political and Social Organization

When Peruvian native communities were titled in the 1970s the need arose for an organizational structure among Amazonian groups to assure their rights to those areas. The anthropologists working for SINAMOS at that time were instrumental in organizing Amazonian Indians into official native communities (comunidades nativas) and suggesting that an apu, or chief, be named for each community. The idea worked well for the Aguaruna. A man with high status, wise, and a good hunter, was chosen as leader. SINAMOS encouraged the communities to have monthly meetings to discuss any problems within the communities. Topics could include domestic
disputes and inter-familial conflicts or problems the community
had acquiring and maintaining their land title. The Aguaruna have
the tradition of long, group discussions for resolving conflicts
which they could now carry out as official meetings. SINAMOS
suggested a similar pattern during the titling of other native
Amazonian groups.

Tribal organizations began to emerge throughout Amazonia within
a few years after titling. Two Aguaruna organizations developed
in the Marañon region. The Consejo Aguaruna-Huambisa (CAH) was
initiated by Peruvian anthropologists working for SINAMOS. It
is the largest of the two organizations and includes 75 of 83 titled
Marañon Aguaruna communities. The remaining communities, influenced
by Jesuit priests in the southernmost distribution of Marañon Aguaruna,
formed the Organización Central Aguaruna del Alto Marañon (OCAAM).

The communities of the Alto Mayo Valley first aligned them­selves directly with OCAAM. Affiliation with this group resulted
from the influence of Aguaruna teachers arriving from Imacita and
Temashnum, two Marañon Aguaruna communities within the realm of
Jesuit influence. The teachers received their primary and
secondary education from mission schools, and knew the leaders
of the Marañon organization. The influence of the teachers during
titling led to alignment with the most familiar organization.

In 1978 the Mayo Aguaruna formed an autonomous organization,
the Organización Aguaruna Alto Mayo (QAAM). They are, however,
still closely affiliated with the Marañon group (OCAAM) for yearly
meetings and for official dealings on a national level. The
OAAM is headed by a president, secretary, treasurer and production delegate. It represents all nine Mayo communities with the main office in Bajo Naranjillo and a branch office in Shimpiyacu. OAAM was formed to deal with the growing number of outside contacts and with the official business of the communities. It has served an important function in this regard and OAAM leaders meet with officials as varied as representatives of the World Bank, heads of local mestizo organizations, and even in one instance, with the current President of Peru.

Establishment of a political organization affected the social hierarchy of the Aguaruna communities. Individuals more adept at interacting with the mestizo world now dominate Aguaruna society. The men most active in the organization have had some education and experience outside of their Aguaruna communities. Teachers and Aguaruna from the Marañón area hold the positions of responsibility. The native Mayo Aguaruna who received schooling in Rioja are also active in the OAAM organization. The *apu* still embodies traditional Aguaruna values and the role of *apu* as arbitrator and leader in community issues remains undisputed. Nevertheless, as external economic, political or legal concerns increase, the communities turn for advice to those who are educated and have experience with mestizos, thus creating a new social hierarchy and new criteria for establishing status.

Emergence of social and political differentiation among the Aguaruna has implications for agriculture. Economic differences now appear among families. Differentiation develops
because of inclination to cultivate rice, access to information, and the availability of money. Teachers are financially able to hire labor to clear, plant, and harvest large areas of rice, and they have access to bank loans, assistance, and information because of their Spanish language facility.

Monolingual Aguaruna have more limited possibilities of interaction with the outside world. They can learn about rice cultivation from the bilingual teachers, but they have less reason to see themselves as part of the mestizo culture and are less likely to be enthusiastic about rice cultivation than the more acculturated Aguaruna. This will change as the next generation of Mayo Aguaruna learn rudimentary Spanish and elements of the national culture in school.

The Organización Aguaruna del Alto Mayo has been active in organizing agricultural production in the nine Mayo communities. The first effort was to encourage rice cultivation through organized work groups. In subsequent years OAAM kept records of rice production and levied a tax (10% of sale) on commercial crops to help pay operating expenses of the organization. The communities approved an OAAM plan in 1983 to ask each head of household to cultivate at least two hectares of land and to designate 20% of the profits to the Organización. The plan was proposed for several reasons. Criticism stemming from mismanagement of the empresa was impetus for a simpler approach to increasing agricultural productivity in the communities. The plan was an effort to target commercial activity, not only in Bajo Naranjillo, but in
all of the communities. Proceeds were to help defray the bills from the bank, which continued to come regardless of the status of the empresa communal, and to help with operating costs of the empresa. By mid-1983, however, only a few Aguaruna had complied with the QAAM request.

**Aguaruna Migrants from the Marañon Valley**

Immigration of Aguaruna from the Marañon region influences both social character and agricultural productivity in the Mayo communities. Eleven years after initial contact in 1972, fourteen teachers and their families were settled throughout the area. One or more teachers reside in each of the Mayo communities; two live in Shimipiyacu and five in Bajo Naranjillo. The remainder of the Marañon immigrants reside in Bajo Naranjillo and account for approximately one third of the families. The settlement of Soritor in Bajo Naranjillo consists of seventeen families, all from the Marañon region. Ten other Marañon families live in the vicinity of Cano Hondo and all are relatives of the teachers.

Several factors contribute to the increasing stream of immigrants since the mid-1970s. Soils of the Marañon Valley are poor compared to those of the Mayo Valley and the area is considerably more rugged. Hectarage is limited, especially among the southern Marañon Aguaruna where colonists and roads have encroached on all but the most inaccessible land. Few commercial crop alternatives exist for the hilly uplands of the Marañon basin. Some cacao is grown but it does not have a stable market with a nationally fixed price as
does rice. Finally, the immigrants are encouraged by the Alto Mayo group to help settle and cultivate the large land holdings. The Aguaruna of the Marañon valley are largely literate and bilingual, whereas those of the Mayo Valley are not; the former are more at ease in participating in a new economy, often are kin to the teachers, and immediately become active in rice cultivation.

Although encouraged to immigrate, the Marañon Aguaruna are distrusted and held in suspicion by Mayo natives. Witchcraft is still prevalent among the Aguaruna and newcomers are frequently accused of causing sickness and death. To avoid problems resulting from conflict with the newcomers, leaders of Bajo Naranjillo now try to direct new immigrants to communities with few people or ample land.

**Contact with Colonists and Mestizos**

Aguaruna in all of the communities have occasional and often friendly contact with the colonists and mestizo settlers who live in the immediate area. Some mestizos have lived so long on Aguaruna property they are considered members of the community. However, conflicts have occurred. Incoming colonists often want access to the land in titled communities and incidents of land invasion and complaints to the Agrarian Reform office are not uncommon. The mestizo villagers of Naranjillo went so far as to send two petitions to President Belaunde. One, sent in August, 1980, asked for the revocation of Perú-Law No. 20653 that gives natives the rights to titled communities. They again sent a petition in March, 1981,
asking for redistribution of native community lands among colonists. Both actions were unsuccessful but they point to the strong feelings of resentment regarding the amount of land titled in native communities. Colonists have also claimed that community lands in Alto Mayo and Huascayacu have been sold to them and they have insisted of the Aguaruna organization that they receive title to the land. Thus far these efforts have not proved successful.

Population statistics in the zone indicate a potential for increasing tension. Population density for all the Mayo Aguaruna communities is 2.25 persons per square kilometer; Bajo Naranjillo has the highest population density with 4.6 persons per square kilometer (QAAM 1981a). By contrast, overall population density for mestizo areas is 10 persons per square kilometer and it approaches 36 persons per square kilometer in the densely settled zones (Perú-CODESAM 1981).

The Aguaruna often describe their communities as wholly composed of natives, but it is not uncommon for mestizos to live on or have access to community land. A mestizo lives in the Cano Hondo settlement of Bajo Naranjillo. Mestizos have married Aguaruna women and live in Dorado and Bajo Naranjillo. The increasing presence of mestizos on community land works against cultural autonomy of the Aguaruna. The mestizo influence serves as an attraction for Aguaruna anxious to integrate with the mestizo world, as well as an alienating force for the Aguaruna trying to preserve a more traditional lifestyle.

There is a greater incidence of mixed marriages and cultural mixing among the Marañon immigrants than among the Mayo natives.
Five Marañón Aguaruna in Bajo Naranjillo have mestizo mates and they are considerably more acculturated than their Aguaruna neighbors. Four out of five of the mestizo spouses do not speak Aguaruna and children use Spanish in the home. In one family of mixed marriage two of the children have mestizo spouses. Both generations of mixed marriages live near the southern border of Bajo Naranjillo, but they define their place of residence as San Juan, the adjacent mestizo community. The family struggles with their identity as Aguaruna and has a tenuous basis for claiming right to live on native lands. One of the sons calls himself "cousin" to a Bajo Naranjillo teacher and has received permission from the community to cultivate the land around his family residence. The remainder of the family bases its use of community land on his permit to cultivate.

**Schools and Education**

The Summer Institute of Linguistics (SIL), a protestant religious group working through the Peruvian Ministry of Education, organizes education facilities for natives throughout eastern Perú. It trains teachers in Pucallpa and the bilingual teachers are then sent to their communities to establish schools. While religious indoctrination exists in SIL's program, the teachers, at least among the Aguaruna, rarely retain overt allegiance to its philosophy.

The SIL translates Indian languages into English and Spanish and publishes the New Testament in native languages. It also publishes the myths and legends of various groups, linguistics
studies, and, when a tribe is large enough, it prints elementary
and secondary level textbooks in the indigenous language. The
Aguaruna receive these local language textbooks through the
Ministry of Education. Classes in the Mayo Aguaruna communities
are given in Aguaruna and Spanish is taught as a second language.

Schools blend aspects of the two cultures other than language.
Students learn math, natural sciences, and the history and geography
of Perú. They also learn Peruvian games such as soccer, Peruvian
and Aguaruna songs, and Aguaruna crafts such as basketry and ceramics.
They have an agriculture class intended to maintain their horticultural
tradition and to introduce the procedures of commercial agriculture.
Teaching of crafts, songs, and agriculture provides a means for
preservation of some elements of indigenous cultural identity in
the education process. Yet children are taken out of the homes
and retaught what they would, and still do, learn effectively at
home. The school experience tends to externalize some traditional
elements in Aguaruna life and presents Peruvian custom and commercial
agriculture as a part of everyday activity.

Each community has at least one school structure for all the
elementary grades. Bajo Naranjillo has two elementary classrooms
and two secondary classrooms; secondary classes were initiated
in 1982. Classrooms are similar in size, style, and materials
to Aguaruna houses. They are partly furnished by ready made furniture
from the Ministry of Education, partly by handmade desks and benches.

Approximately equal numbers of boys and girls attend primary
school, but boys significantly outnumber girls in secondary schools
(Table 8). Rather distinct gender separation normally occurs in traditional Aguaruna society. Hence bringing boys and girls together provides a setting for which there is little prior experience; instances of elopements, pregnancies, and suicides now occur among the older school children.

Besides formal learning, school attendance structures the time and activities of families. It lessens the opportunity for children to learn traditional activities and reduces their contribution to childcare, garden work, and food gathering. The school schedule structures the yearly cycle. Classes begin in April and end in December in accordance with the Peruvian school calendar. The communities mark the end of the school cycle with a combination of Peruvian and traditional Aguaruna ceremonies. A similar festival takes place in mid-year (July) for Fiestas Patrias, the Peruvian independence celebration.

The Mayo natives have always harbored some suspicion of the teachers in their midst, disliking some and demanding replacements. They have been accused of witchcraft and of seducing wives and daughters. Community members of Bajo Naranjillo threatened to expell all of the teachers in 1982. They felt them to be responsible for the involvement in the empresa comunal, excessive land clearing, and forcing the students to do physical labor. The situation was resolved, but it indicates the tension that exists between the Mayo natives and the educated "foreigners".

The educational system is a component of integration into the national culture and receives criticism from the Aguaruna as
<table>
<thead>
<tr>
<th>Community</th>
<th>Primary Grades</th>
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<th>Grade 2</th>
<th>Grade 3</th>
<th>Grade 4</th>
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</table>

an agent of change. The teachers are not oblivious to their role as change agents and many are concerned about outside influence in the communities. Some argue abstractly that the Aguaruna and other native groups should maintain their culture intact without the influence of a Western model of education; others see contact between mestizos and natives necessitating instruction in certain language and social skills.

Changing Family Relations

The impact of social change is perhaps most evident in the alteration of male and female roles in the family.

Life in the Alto Mayo now requires skills different from those prized by the ancestors, and this invariably results in a devaluation of traditional activities that were once a source of pride and self-esteem. Men, however, have been able to acquire new skills more readily than women. They become bilingual teachers, health workers, or organizers of agricultural cooperatives. By and large, women are denied access to these new roles. Now a woman's crops are less highly valued than male cash crops. Her herbal medicines are sought less frequently than pharmaceuticals dispersed by men. Her clay pots have been replaced by metal or plastic trade items, the purchase of which is controlled by men (Brown 1982: 9).

Women have higher rates of illiteracy and monolingualism than do men thus inhibiting the participation of women in activities outside of Aguaruna culture; 3% of female and 9% of male adults have completed five years of primary school (QAAM 1981b). This may change if the current generation of females attends school in numbers equal to males (Table 8).

The Aguaruna show signs of increasing social and emotional stress, and the current social and economic changes provide real
potential for increasing domestic conflict (Brown 1982). Suicide, the most extreme response to social and emotional stress, appears more common among women than men and often seems associated with situations of unrequited love, adultery, and what would appear to be simple household squabbles.

Conditions that aggravate domestic conflict are magnified under present circumstances. A woman's agricultural project floundered after it took too much time away from routine activities and disrupted prescribed social functions. Women were spatially and socially displaced from their traditional roles and the project was summarily disapproved by community males.

For women to gain training or language facility they often must go outside the native communities. A few women among the Mayo natives have learned as children in Rioja to read, write, and speak Spanish. One of the women took a nurse's training course in Moyobamba and is now in charge of the Bajo Naranjillo health post. It is difficult, however, for women willingly to leave their community for weeks at a time for training or for husbands to consent to their traveling alone to a mestizo community.

**Institutional Influence**

Religious and economic groups are active in the Alto Mayo Valley. In the aggregate these institutions serve as agents of culture change; they bring the culture and customs of the outside world.
Religious Institutions

Religious groups have a proselytizing facet to them; they are also purveyors of knowledge and technology. The Aguaruna have resisted missionizing efforts despite continuing contact with the Summer Institute of Linguistics (SIL) and other church organizations which seek to establish themselves in the communities. The presence of bilingual teachers, trained by SIL, has not resulted in significant conversion of Aguaruna. The teachers leave their training programs more acculturated than those without formal training, but they do not act as proselytizers in the communities. SIL maintains contact with native communities via the bilingual teachers. It provides chain saws, typewriters, and boat motors to the native communities, offers agricultural advice, and encourages agricultural production by providing seeds and stock animals at low prices. Although SIL does not directly fund projects, it substantially influences technology and development in the communities.

The community of Bajo Naranjillo has begun to seek other avenues of assistance in an attempt to diversify contacts with outside groups and to ease the economic bind resulting from the empresa communal. Vecinos Mundiales, another protestant organization, has offered suggestions for commercial production of peanuts, coffee, or cacao for the national market. In 1983 QAAM was considering applying for a subsidy from Catholic Relief Services to establish a communal storage project.
Economic Institutions

The increase in economic activity throughout the Alto Mayo Valley has encouraged the incoming of a number of development agencies seeking to extend social services and increase economic productivity in the communities. The Proyecto Especial Alto Mayo (PEAM), a World Bank development project designed to consolidate settlement and streamline production in the colonist zones, is the most prominent organization in the valley.

The PEAM was first conceived in 1980 as part of a series of special projects to be implemented in the wet tropics of Perú (Figure 14). The agricultural potential of the Alto Mayo Valley, coupled with the flow of mestizo immigrants and already widespread rice cultivation, made settlement consolidation a high priority. Peru negotiated with the World Bank for an 80 million dollar loan to build roads, provide credit and agricultural assistance, and improve health and welfare services in the valley. The project during its first phase (1983-1987) covers 120,000 hectares on the right bank of the Mayo River and a similar amount of land on the left bank for the second phase (1988-1992) (Figure 22).

Initially the project did not include the native communities of the Alto Mayo. The policy of the World Bank (Goodland 1982) plus the effects of adverse publicity given the Proyecto Especial Pichis-Palcazu for not incorporating indigenous groups in project plans (Smith 1983), led the Bank to stipulate to the Peruvian government that the Aguaruna communities be included in the project. Other reasons for including the Mayo native communities in PEAM plans
Figure 22. Area of influence for first phase, Proyecto Especial Alto Mayo. Source: Perú-PEAM (1982b).

were the studies outlining the extent of arable land in Aguaruna communities and the willingness of some Aguaruna to cultivate rice. The Aguaruna will now receive agricultural and technological assistance, individual credit opportunities, potable water, and health and education facilities as part of the project.

Communities along the Carretera Marginal began receiving benefits from the PEAM in 1983. CIPA (Centro de Investigacion y Promocion Agropecuario) hired in June, 1983, two bilingual Aguaruna extension agents from the Marañon region to begin field work in
the communities. The agents offer advice, provide rice seed from CIPA, and are to start experimental plots throughout the native areas. CIPA programs emphasize hybrid seeds and high capital inputs of fertilizer and herbicides. The mechanics of irrigation, use of an oxen team, and other techniques to increase agricultural productivity have not yet been included despite the Aguaruna need for information on these techniques.

PEAM began construction in 1983 of several brick classrooms for Bajo Naranjillo. Improved school facilities, health posts and potable water are planned for most of the communities. Permanent structures for school and health and the establishment of wells will function as centripetal forces in the centralization of settlement.

Other Outside Contact

Outside contact with the Aguaruna has greatly increased. An "adventure" tour agency from Lima visited Bajo Naranjillo in 1982 intending to establish hunting and fishing programs for tourists. Organized tourist visits to native groups around Iquitos, Perú, and Leticia, Colombia, have had a negative impact. Tourist entrepreneurs have relocated Yagua Indians near tourist centers to allow easy access for visitors and the natives are heavily dependent on tourist income for their livelihood (Seiler-Baldinger 1980). The Aguaruna have not yet established a policy for responding to

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1CIPA has part of the contract for providing services under the Proyecto Especial Alto Mayo.
tourist programs.

Yet the Aguaruna communities of the Alto Mayo have somewhat become tourist attractions, not for organized pleasure tours, but for officials. Bajo Naranjillo's accessible location makes it an easy stopping place for visiting dignitaries. The Aguaruna of Bajo Naranjillo were filmed for national television twice during 1982-1983. President Belaunde's visit in September, 1982, was filmed as part of a promotional tour to underscore his unflagging support of development in eastern Peru. The President interviewed the community apu via a bilingual teacher; the President asked the apu questions about his twenty children and two wives, and at the end of the interview embraced him and called him a "brother" and a "compatriot". Another film of Bajo Naranjillo was made in 1983 as part of a documentary on the department of San Martín.

One of the main results of the Proyecto Especial Alto Mayo has been to generate a stream of PEAM personnel visitors, World Bank representatives and representatives of affiliated organizations. Short term visits by foreign experts have added to the boom frontier atmosphere created by widespread rice cultivation in the zone.

Other non-commercial contact has also taken place. A conference for Fiestas Patrias in 1982, organized by a group of Bahai, brought a delegation of North American Indians to meet with the Alto Mayo Aguaruna. Amidst masato and Navajo Eagle dances was the exchange of stories about life and customs of the two groups.

The Aguaruna leaders have mixed attitudes toward outside contact. They are flattered that the Proyecto Especial Alto Mayo
includes their communities and they are proud that they are filmed for national television. On the other hand, they voice a distrust of Peruvians for being incompetent and uncaring. They want to work with foreigners and be assured of foreign money and efficiency. They are apathetic toward the present government but they were quick to arrange for President Belaunde's visit and unabashedly on national television presented him with a list of demands and requirements for the Mayo communities.

After the distrust and problems generated during the tractor negotiations, OAAM has been more cautious of whom they allow in the communities. Any representative of the local bureaucracies must have identification and a permit to be on community land. Bajo Naranjillo seized a Ministry of Agriculture truck when the driver could not document the reason for being in the community. OAAM was reluctant to let the CIPA project get started, even with Aguaruna technicians; even now it is only tolerated and it has no active participation by community members.
CONCLUDING REMARKS

The Process of Development

This study has documented the transition of the Alto Mayo Aguaruna from a subsistence to a commercial economy. It has shown economic change among the Aguaruna and how that change reflects in their culture and their physical environment. The Aguaruna have moved from a relatively secure and sufficient subsistence economy to a production system dependent on the vagaries of unstable national and international economies. Their exposure to an outside economy has introduced unfamiliar concepts and new patterns of activity.

In everyday experience economic change involves modification of agricultural, social, and spatial systems. The effort of extracting an increasing amount from the physical environment, beyond subsistence needs, produces a variety of changes in the culture, in the ecology, and in the economy of the Aguaruna. Adaptation to changes in the immediate physical environment demands new types of information, and traditional knowledge systems are replaced with the information necessary successfully to manage a new system of environmental exploitation. A more complex social organization and changes in material culture further indicate the reorientation from subsistence to commercial production. The complex of processes, associated
with economic development and triggered by the move to cultivate commercial rice, is clearly reflected in modification of the culture and custom of the Aguaruna.

In the context of this study economic development means not merely monetary gain but the processes of change. The notion of economic development overlaps with cultural ecology inasmuch as both are concerned with process. The Mayo Aguaruna provide an opportunity to integrate these two concepts. The Aguaruna are moving from an economy typically documented by cultural ecological studies to a more complex system of interaction with the environment. Agricultural change represents a restructuring of Aguaruna life and provides the catalyst around which Aguaruna culture undergoes modification. The Aguaruna cannot participate in the local economy and become rice cultivators without losing fundamental aspects of their traditional economy and traditional cultural patterns. With the advent of rice production, and thereby economic development, the traditional links among resource base, land use, and cultural integrity dissolve. While the Aguaruna have ample area legally under their control to pursue traditional subsistence, outside influences have intervened.

The Proyecto Especial Alto Mayo represents the vehicle of national and international influence in the Alto Mayo Valley. The project comes ten years after mestizo immigration into the valley, yet it typifies development occurring throughout eastern Perú and it has potentially significant affect on the Aguaruna communities. Planned development cannot foster the slow process
of cultural adaptation that leads to stable adjustments, but it can aid in providing external signs of progress in the form of such things as health and welfare services. Indigenous people are often inadvertent participants in development and they are pulled into a national culture and a national economy regardless of efforts made or not made on their behalf. Deliberate policy for development in eastern Perú, in the form of Proyectos Especiales, has been criticized on environmental bases and for its attitude toward indigenous peoples. The projects, however, provide a framework for considering the rights, welfare, and cultural prerogative of native groups, issues not likely dealt with without the intervention of institutionalized policy.

The development process, always complex, for the Aguaruna requires bridging the intellectual, economic, and cultural gap between the world of international banking and the mestizo colonist or indigenous Aguaruna of the Alto Mayo Valley. The middle level bureaucrat of the Peruvian provinces becomes the link in this transition. Bureaucratic communication with the Aguaruna is even more difficult than with the colonists; differences in language, education, social relations, and custom set the Aguaruna farther apart from mainstream Peruvian culture and cause them to be more marginalized than their mestizo neighbors in the valley.

Many other problems accompany the integration of the Aguaruna into the development process. These include the effect on socially prescribed roles of men and women, the upsetting of traditional communal concepts of land and resources, the creation of classes
within a former egalitarian society, and environmental disturbances such as deforestation, water pollution, and exposure to disease. Still further problems arise from the Aguaruna effort to adopt commercial agriculture.

Agriculture and Society

Economic change in the Alto Mayo Valley brought the introduction of new technology, some of it requiring adaptations that the Aguaruna have been unable to absorb. The tractor scheme in Bajo Naranjillo required more labor than anticipated and it grossly miscalculated the financial, mechanical, and administrative difficulties inherent in such an enterprise. Such a dramatic change in traditional practices was not feasible. If progress is to occur it will be through gradual absorption of new practices and gradual accumulation of the knowledge and expertise to deal with them. Some mechanization has been absorbed, such as the use of chain saws and motors for boats, but in agriculture innovation has progressed more slowly.

Aguaruna commercial agriculture remains largely trial and error. Knowledge of when to plant, labor requirements for a certain hectarage, and the intricacies of marketing are not yet fully part of Aguaruna technique. Because of problems stemming from Aguaruna involvement with the bank loan, the Aguaruna now resist outside help of any kind, including agricultural extension advice. Their rush to embrace a capital-intensive operation such as the tractor project indicates lack of awareness of the complexities and implica-
lations of economic change.

The effort to enter a cash economy has resulted in greater labor demands to maintain rice fields than was required for traditional shifting cultivation. By entering a rice economy the Aguaruna have opted for money and material goods rather than production of foodstuffs; high-yield, irrigated rice falls short (5-6000 kg/ha) of the yield of manioc (10,000 kg/ha) (Berlin and Berlin 1977; Denevan 1971). Thus, labor investment is not for foodstuffs production, but apparently for money that permits entry into the modern economy; money becomes valued more than leisure and community. As the demands for labor change and the desire for cash increases, traditional activities are replaced with an alternative, economic activity.

Social factors mostly determine which Aguaruna become rice cultivators. The educated, acculturated Aguaruna who have emigrated from the Marañon Valley seek to imitate the agricultural patterns of the mestizo colonists in the surrounding area. They bring the motivation and dynamism that accompany a new activity. They become part of the local rice economy and contribute to the creation of intracommunity class differentiation despite abundant and equal availability to land resources for all Aguaruna. They have access to loans and their salaries enable them to hire workers; they cultivate two or more hectares of land. As the immigrant teachers assume new, dominant roles in traditional Aguaruna society, the emerging social stratification within the society becomes amplified.

Integration into the national market system prevails and, as a result, commercial activity and outside influence function
to confuse traditional patterns and attitude toward community. Increased commercialization leads to disputes over income, thereby breaking down cooperative effort at land clearing and harvesting. By community consensus, labor expended for purely commercial endeavors is not on a cooperative basis. The shift to monoculture of commercial rice, instead of mixed cropping for subsistence, results in the change from community production and consumption of goods to a focus on the individual as evident in Bajo Naranjillo's division of land into individual plots.

**Agriculture and Settlement**

The effect of agricultural change on settlement patterns appears in a variety of ways on the Aguaruna landscape. A clustering of houses in some Mayo communities has resulted in the removal of Aguaruna homes from a forested environment. Commercial crop production introduces both social and environmental conditions which foster village settlement. In some communities the location of houses has not changed, but the surrounding environment has dramatically changed; isolated houses are now surrounded by large plots of commercial rice, a visual expression of declining involvement in traditional economic activities.

Settlement and landscape change reflect process, they indicate a changing relationship to the environment, either conscious or unconscious, and so, they symbolize the development process. Symbols of acculturation such as open spaces in a formal community layout, western clothes, the Spanish language, and service functions
within a community, are signals to the outside world that the
Aguaruna are civilized, or developed. They are also the keys to
internal change within the Aguaruna communities.

The Experience of Change

Since development is both economic and cultural, can the Aguaruna
participate in a national economy while still retaining their cultural
integrity? Can they assume the characteristics of the national
culture, or at least those characteristics necessary to deal with
the new economy, without forfeiting their cultural identity? Health,
diet, and education are as important to the maintenance of their
cultural identity and economic viability as are 50 hectares of
irrigated rice. It is unlikely the Aguaruna will remain forest
dwellers, but it is equally unlikely they immediately will become
proficient rice growers. They must have both the opportunity to
acquire the essential techniques and the means to maintain their
wellbeing and to make their own decisions under changing conditions.
The Mayo Aguaruna must adjust to new conditions of their physical
and social world much as if they were living in a new world. They
might chose to retain traditional ways, but soon that choice will
be removed; little or no forest will be left to maintain traditional
subsistence patterns.

The Aguaruna need the necessary knowledge to live in the new
economic system. Mestizos frequently regard them as incompetent
because they do not know how to survive in a mestizo world. While
the Aguaruna have vast knowledge of their traditional world, its
environment, and their complex social system, too often that knowledge does not help. To learn to cultivate rice requires adjustment and to a certain extent absorption into the foreign cultural, economic system. Land, pride, language, and the spirit of being Aguaruna still hold them together; the Aguaruna will not easily relinquish those cultural elements. Yet in some ways they do mimic mestizo life. The younger Aguaruna talk of maybe marrying a mestizo, of putting a tin roof on their house, of sending their children to Rioja, Moyobamba, or Lima to school, and they look forward with curiosity to an occasional trip to Chiclayo.

The Alto Mayo Aguaruna are an example of the incorporation of a marginal group into the national society. Before the advent of rice cultivation the Aguaruna were not aware of being poor and disadvantaged and, in fact, they were not. Once the Aguaruna initiated rice cultivation they competed in a system in which they were classified as inferior both by mestizo and local officials. The health and welfare conditions for mestizo colonists in the valley are no better than those of the Aguaruna, yet the Aguaruna are considered inferior and economically disadvantaged. This designation in turn serves to thwart Aguaruna social and economic progress. While the Aguaruna may be land rich, they lack the social, economic, and political skills to participate fully in a mestizo society and to gain access to the larger economic system of the country.

Aguaruna economic development has entailed a cultural transition from a forested world into an electronic age. Insufficient time has been available for adaptation to new technology, new crops,
and new methods of cultivation. The Mayo Aguaruna have gone from a condition of intimate, linked existence between subsistence economy and the environment to a condition where their economy makes extractive demands upon the environment. In the new rice economy, labor and time have become distinct, valued entities separated from the traditional cultural matrix.

The changes resulting from rice cultivation have not necessarily resulted in improvements in Aguaruna life. Nevertheless, those changes have been in large part economic and therefore regarded as development and as signs of progress. For the Aguaruna development signifies that they no longer live in a forest, but in a world of rice fields, pastures, fallow land, and roads. It has also meant a scrambling to learn essential techniques of rice cultivation and to acquire the political and social expertise to deal with a mestizo world.

Cultural and economic change is complex. Aguaruna leadership, while enthusiastic about rice cultivation, proudly adheres to being Aguaruna and its more progressive efforts often are moderated by traditional components of the society. The adjustments necessary for successful economic change come slowly and the Aguaruna have had insufficient time to acquire the knowledge and experience to reach appropriate decisions. Mistakes such as the tractor project have been made. The complexity of cultural development and economic development frustrates planners and scholars who seek to order an unordered world. That complexity frustrates also the efforts of the Aguaruna to acquire the symbols of development such as
radios, watches, and tractors.

The development process, much as Brookfield (1975: xi) explained it, does not lead to clear cut economic gain for all. The Aguaruna are struggling to be "developed" in an underdeveloped country. In so doing they have become marginalized in the society they seek to emulate, and they have become alienated from their own tradition despite external signs of success with rice cultivation.
LIST OF FOREIGN TERMS

Achiote. *Bixa orellana*, seed pods yield a deep red paste used as face paint and colorant.

Agricultor. Agriculturalist.

Aguajal. Swampy area dominated by the *Mauritia flexuosa* palm.

Aquaie. Fruit of the *Mauritia flexuosa* palm. A popular snack food in eastern Peru.

Apu. A Quechua word meaning chief; now commonly used for lowland tribes (sub-apu, roughly, vice-president or vice-chief).


Barbasco. *Lonchocarpus nicou*, a leafy shrub used as a fish poison.

Bijau. Banana-like leaves of *Heliconia* sp. are used to wrap food for cooking.

Campana chica. Agricultural season from August through January, season of lower precipitation and lower yields.

Campana grande. Agricultural season from November through June, season of higher precipitation and higher yields.

Carachama. An armored catfish, *Canthopomus genibarbis*, commonly eaten by the Aguaruna.

Carretera Marginal de la Selva. A partially completed highway project intended to parallel the eastern flank of the Andes from Colombia to Bolivia.

Ceja de la montaña. Literally, "eyebrow of the mountain", rugged area between the Andean highlands and Amazonian lowlands.

Chamizal. A caliche-like layer between the Tumbaro and Naranjos rivers in the Alto Mayo Valley.

Chonta. Heart of palm.

Civilizado. Civilized.

Comunero. Member of a native community.
Comunidades Nativas. Area designated as "native communities" after titling of land in eastern Peru. Analogous to Indian reservations in the United States.

Empresa comunal. A communal enterprise started in Bajo Naranjillo to buy a tractor and irrigate 50 hectares of rice a year on native community land.

Fiestas Patrias. The Peruvian independence celebration, July 28 and 29.

Huaca. Clibadium sp., a leafy shrub used as a fish poison.

Huacrpona. A hardwood palm, Iriartea ventricosa.

Huicungo. A palm with edible fruit and heart, Astrocaryum huicungo.

Huito. Genipa americana, tree fruit used as dye and colorant.

Indios. Indians (native Americans).

Mamavac. Aguaruna for "small fish", probably, Pterygoplicthys gibbiceps.

Masato. A drink made of fermented manioc (Manihot esculenta), an important source of protein and calories for the Aguaruna.

Pajarascra. Method of cooking food by wrapping it in leaves of Heliconia sp. and placing it in a fire.

Peki-peki. A long-shafted outboard motor common in Amazonian waters, propeller at end of long shaft can be easily lifted over shoals and floating logs.

Pico. Metal rod used as a digging stick in the Alto Mayo Valley.

Pifayo. A palm with edible fruit, Guilielma gasipaes.

Piquete. Metal rod used as a digging stick in the Alto Mayo Valley.

Pona. A hardwood palm, Euterpe precatoria.

Quechua. Language diffused during the reign of the Incas, various dialects are now spoken throughout highland Peru.

Reduccón. Mission villages of colonial era, organized by Spanish priests to encourage agglomerated Indian settlement.

Selva. Jungle or tropical forest zone of Peru.
Selva alta. The high jungle of eastern Peru, roughly from 500 to 3000 meters.

Selva central. The tropical forest area directly east of Lima.

Shapaja. A thatching palm, Sheelea sp.

Sierra. Highland.

Sol, sole. Peruvian currency, value fluctuates significantly because of inflation and devaluation. Between July 1982 and August 1983 the value declined from 650 S/ = $1.00 to 2000 S/ = $1.00. Prices and commodity values in the Alto Mayo Valley varied accordingly.

Su casa. Denotes the occupation 'housewife'.

Suri. Larval stage of the Coleopterus sp. beetle, favorite food of the Aguaruna.

Tierra firme. Tertiary lakebed surface of lowland Amazonia above the riverine floodplain.

Tornillo. Cedrelinga catenaeformis, a tropical hardwood tree.

Unguravi. A palm with edible fruit and heart, Jessenia weberbaueri.

Varzea. Seasonally flooded riverine area of lowland Amazonia.

Yarina. A thatching palm, Phytelephas microcarpa.

Yuca. Manioc, a large shrub with edible tubers, staple food of the Aguaruna, Manihot esculenta.

Yucál. A manioc garden.
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Martha Adrienne Works was born in Saltillo, Mexico, on August 27, 1952. Her family moved to Florida in 1955 and she attended elementary and secondary schools in Sarasota, Florida. She continued her education at Universidad de las Americas in Puebla, Mexico where she received a B.A. in Anthropology in 1974. She participated in several archeological and ethnographic projects in Central Mexico during her undergraduate work. Before returning to graduate school, Ms. Works spent three years working in Florida for a migrant farm worker program, where she taught English as a second language and served as a job training coordinator and counselor. She completed a Master of Arts degree in Geography at Arizona State University in 1980. Her thesis involved four months of field work and research in lowland Peru. In August, 1980, Ms. Works entered the Ph.D. program in Geography at Louisiana State University. This dissertation is presented toward completion of that degree. Ms. Works has traveled throughout Mexico and South America. Her present research interests include historical and cultural geography of Latin America and development planning in Amazonia.
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