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BATAK INTERHOUSEHOLD FOOD SHARING: A SYSTEMATIC ANALYSIS OF FOOD MANAGEMENT OF MARGINAL AGRICULTURALISTS IN THE PHILIPPINES

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BATAK INTERHOUSEHOLD FOOD SHARING: A SYSTEMIC ANALYSIS

OF FOOD MANAGEMENT OF MARGINAL AGRICULTURALISTS

IN THE PHILIPPINES

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By

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Alan Howard
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The problem of cyclical food stress among marginal agriculturalists first came to my attention in 1968 when I was given the opportunity by Silliman University to run its Negrito Action-Research Project on Central Negros Island, Philippines a month after my graduation from college. It was this first exposure that was partly responsible for the evolution of my present research problem. A year later, I joined the faculty of the Socio-Anthropology Department of the University of San Carlos, Cebu City, Philippines and worked for my master's degree in Anthropology. My exposure to populaton studies at this time while working with Father Wilehlm Flieger provided me with a wider perspective in the understanding of the link between population and food problems. In 1975 I rejoined Silliman University. This time, as a faculty member of the Socio-Anthropology Department, I received a grant from the Southeast Asian Population Research Awards Program (SEAPRAP) based in Singapore to do research on Population, Production and Land Utilization Practices of Shifting Cultivators on Negros Island, Philippines. That research work helped me to gain more insight into the intricacies of cyclical food stress and how people try to cope with it. To all the people and agencies that came into the scene during those episodes that helped shape the ideas in my mind, go my sincerest thanks.

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ABSTRACT

The Batak, a marginal agriculturalist group of Palawan Island, Philippines, are faced with progressive food stress due to deforestation (caused by logging and frontier settling activities) and increasing interethnic competition for resource use. This food stress is aggravated by the seasonal unavailability of certain resources. They have responded technologically to the progressive food stress and socially, through interhousehold food sharing, to the seasonal fluctuation of food supply. In particular, food sharing assumes greater importance as the Batak become more sedentarized and as their forest is depleted abandoning the past hunter-gatherers' coping mechanisms of band fission-fusion and circular migration.

To document this situation, data were collected on a bi-monthly basis for one year for seven households, each representing a different stage of the life-cycle of the family. Cultural ecology and systems approaches were combined with microanalysis in a diachronic perspective to analyze interhousehold food sharing.

The main conclusions of the study are as follows: (1) Interhousehold food sharing is an integral component of the Batak system of food management and enables the population to cope with cyclical food stress. (2) Depending on their stage in the life-cycle of the family, some households have a larger labor supply and lower food requirements, thus food flows from them to households in other stages with food deficit. (3) Two types of interhousehold food sharing are correlated with seasonality--asymmetrical (discriminate, focused, and

controlled) during the months of scarcity, and symmetrical (generalized, diffused, and generous) at periods of abundance. The asymmetrical type is associated with optimization of short-term socioeconomic benefits and minimization of short-term risks, periods when foods have high immediate utility value, and with exchange between individuals who are close both in kinship and residence. The conditions for symmetrical food sharing are just the opposite. (4) The intensity of food sharing is affected by the manner of sharing, types of food, kinship, and geographical distance. (5) Households also share capital resources from which food can be derived such as swidden plots, wild resin camps, labor, tools, and information. The intensity of this sharing is also affected by the agricultural cycle, periods of food scarcity, kinship and geographical distance. (6) Information sharing is related to two factors, ecology and mobility.

As background to the understanding of the Batak food management system, aspects of the environment, demography, and culture are also described. The study concludes with a chapter on development agents. It also offers an evaluation of prospects for the future of the Batak in particular, and marginal agriculturalists in general. In addition, further research possibilities of similar interest are envisaged.

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PREFACE

Existing literature on food problems are replete with writings on the issue of technological responses to progressive gross caloric decline caused by resource depletion and increasing human competition in their use. But the issue of social responses to cyclical food scarcity caused by the seasonality of resources appears to be not as well explored. Although the materials on the latter issue deal with a number of social strategies, interhousehold food sharing is, however, neglected.

This study looks at interhousehold food sharing as one of the coping strategies for dealing with the problem of cyclical food fluctuations. Regular band fusion and fission as well as seasonal circular migration may lessen the stress of cyclical food difficulty but these mechanisms can eventually lose their adaptive value when forest area dwindles and when populations grow more sedentary. Such changes are now taking place among the Batak. Aside from the other forms of exchange, interhousehold food sharing provides a major alternative for them.

Viewed in the context of the dynamic nature of the household structure, interhousehold food sharing is, in practice and in theory, adaptive. Since a particular household undergoes changes in structure caused by the changing domestic developmental cycle, its food production capability and needs change too. Theoretically, some households will have more food than others at one point in time. The former may then serve as food givers to the latter during that period.

Cognizant of the "human flexibility, creativity, and responsiveness to changing conditions" (Vayda 1980: 188), this study proceeds to analyze the interhousehold food sharing behavior of the Batak.

Without rejecting the symbolic dimension of interhousehold food sharing, I attempted to demonstrate, with empirical evidence, its material meaning. This is pursued by employing microanalysis with a systemic perspective utilizing the "situational" (Vayda 1980: 187) and "processual" (Orlove 1980: 245) approaches in cultural ecology on a diachronic basis. Using the household as the unit of analysis, this inquiry shows the temporal and interhousehold variability in food production and consequently per capita food supply between households.

Food exchange as a response to food problems has been approached by many researchers on a macro level thus neglecting the household as the unit where food resources may be mobilized. The macro approach is based on the following assumptions: (1) only population groups living in different areas whose resource structure and content are different can provide food to another group in another area; (2) each population group has exclusive rights to its own resources and others do not have access to them; and (3) all households in a population face similar food problems at the same time and unless households involved come from two different geographical areas where resources are different or exploit different niches, interhousehold food exchange is adaptively meaningless. This study criticizes these assumptions.

One major hypothesis of this study is: Interhousehold food sharing, as an integral part of the Batak's system of food management, is a coping mechanism for cyclical food scarcity. The following sub-hypotheses were likewise explored in the field:

(1) Food scarcity is a cyclical phenomenon punctuated by periods of food adequacy.

(2) Food scarcity is not necessarily a problem for the entire population at one point in time. While some households have very limited food during times of stress, others will have more than enough.

(3) Household structure is changing due to the family life-cycle stages and hence its food production capability and food needs are likewise changing. At one stage it will experience food deficit, and in another surplus.

(4) Territorial boundaries between population groups are not well defined and movement across boundaries is common. What keeps households from utilizing resources in other territories may not necessarily be ownership but simply accessibility and availability of labor in the domestic unit.

(5) Response to cyclical food scarcity does not necessarily mean providing a sufficient food supply in the household but rather involves the process of making the most out of the limited food supply to tide them over to the next period of abundance.

From April, 1980 to May, 1981, data were collected in the field. During the first two months, April and May, 1980, a census was done for four out of the five widely scattered major Batak settlements. Continuous monitoring of demographic information such as births, deaths and other relevant information was carried out throughout the research period to establish internal consistency and reliability of data. The evidence is presented in Chapter IV which puts the thrust of the analysis in the context of the Batak's present system of food management. In an earlier analysis of the present demographic conditions of the Batak, Eder (1977a) looked at their depopulation as a consequential condition from their inability to cope with food scarcity. In this study I present an alternative approach by looking at depopulation as a positive (dynamic) process of responding to increasing food difficulty given their present technological system and resource conditions.

For the remaining twelve months, intensive information was collected on a bi-monthly basis from the seven household cases (EGO HOUSEHOLDS) representing various family life-cycle stages chiefly in one particular village, Kalakuasan. This information consisted of the following: household food production and sources, household food sharing and distribution, household food consumption, and time utilization practices. Food produced, shared and consumed was weighed. Food consumption and sharing outside the households were taken into account and the context determined. To establish the full context of food giving and receiving as well as to provide bases for cross-checking the data, information was also collected from the food givers to, and receivers from, the seven EGO households. The results are presented in Chapters VI, VII, and VIII after a descriptive treatment of the present sociocultural and technological system of the Batak in Chapter V. By putting the economic system of the Batak in its sociocultural and ecological perspective in Chapter V, the quantified discussion of food production, distribution, and consumption in Chapter VI becomes meaningful. Chapter VI empirically demonstrates the interhousehold variability in food production and consequently in food supply. The data on household food consumption reveal that a household does not necessarily consume an amount equal to its production. It may consume more or less. The difference can be accounted for in terms of the amount of food received from, and given to, other households.

Empirical evidence of interhousehold food sharing shown by the quantity of food given and received by a household is presented in Chapter VI. The following chapter (Chapter VII) delineates the mechanics and procedure of sharing food. The data indicate that the Batak's highly calculative risk minimizing behavior affords them the optimum socioeconomic and nutritional benefits from food resources at certain points in time. Some specific situations however do not allow pure economic analysis, in which case the symbolic meaning of food sharing becomes implicit.

The importance of information sharing, as an adaptive mechanism, emerged during the course of the field research. Chapter VIII analyzes the Batak information sharing practices and shows that they are ways of indirectly sharing food. As an adaptive mechanism, it is related to ecology and mobility.

This work therefore provides an alternative approach to the macro analysis of (integroup, intervillage, or interethnic) food exchange and questions the appropriateness of a reductionistic analysis which employs either the symbolic (to preserve social integration) or the materialist (gross material benefits) framework. Human behavior is too complex to be categorically placed in either of the two extreme models. A micro analysis on a diachronic basis employing a situational or processual approach in cultural ecology allows one to take into account the material and the symbolic aspects of human behavior.

The utilitarian value of the study is articulated in Chapter X. Guided by the principle of establishing a sustainable society as the objective of an economic system, this chapter finnally suggests a model for assisting the marginal agriculturalists to help themselves.

CHAPTER I

INTRODUCTION

> Many great civilizations have fallen in the last 2,000 years, even in the midst of material plenty, while . . . [others] tenaciously maintained themselves in an incomparably more difficult habitat. The race is not to the swift, nor the battle to the strong. (Sahlins and Service 1960: 27-28)

Marginal agriculturalists[1] in the Third World countries are facing tremendous food problems today. These are probably the worst they had ever experienced in the entire history of their culture (Bodley 1982; Siverts 1972; Varese 1972). Such problems are a result of the following:

(1) Resource Depletion. At present about 830 million hectares of forest in the humid tropics are on their way to being wiped out completely; 400 million in tropical America, 250 million in Asia-Pacific, and the rest in Equatorial Africa (Vergara 1981: 1). Myers (1980) estimated that these forests are cut down at a rate of 40 hectares per minute or 21 million annually. Assuming that this rate continues, the forest will disappear in the next 25 to 30 years (Bene et al. 1977). For the marginal agriculturalists whose food base and home are the forest, the socioeconomic, psychological, environmental and cultural effects on their survival and well-being are not hard to imagine.

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[1]"Marginal agriculturalists" are indigenous swiddening population who also depend on hunting, collecting, fishing, and wage labor (also see Maceda 1965). The phrase is not used as a derogatory term representing an inferior type in the evolutionary ladder of technology.

Today, we find these forest-dependent people eking out a living because their lands have been deforested. Since their knowledge and skills are still adapted to the forest ecosystem (Eder 1978), their food productivity probably has suffered. The decline of their overall household caloric production and the increasing national demand for the declining supply of forest products have gradually pressured them to participate in a monetized trade, an activity which is less calorically profitable than their traditional subsistence collecting activity (Eder 1978). The contact between the culturally dominant and subordinate groups in the trading process adversely affects the latter's sociocultural system and consequently their dignity and self-pride (Bodley 1982). Psychological stress may further generate varying degrees of sociocultural disintegration (Appell 1974; Coopersmith 1967; Wallace 1968).

(2) Dislocation. The growing lowland population pressure keeps pushing these groups of people to "areas which are marginal to exploitation at a higher level, usually internal mountainous . . . not suited for agriculture" (UNESCO 1979: 324). This makes the latter's life more difficult. As the pressure increases, more intense competition between the marginal agriculturalists and other ethnic groups in the utilization of resources results. Past experiences usually indicate that the culturally inferior population is the one that suffers most in this kind of competition (Bodley 1982).

(3) Tourism. The rising interest of the Third World countries in the tourism industry,[2] allegedly to increase their national revenues, has encouraged these countries to advertise and attract tourists from all over the world. Various packages of tourist services using highly enticing labels such as "adventure tourism," "exotic tours," or "safari tours" are offered, and these often use the natives as commodities to see and enjoy. The extreme contrast between the "haves" and the "have nots" is unwittingly but clearly demonstrated during the contact between the tourists and the natives. The natives' desire to possess the material things carried by the tourists steadily rises making the former groups more dissatisfied with their own present condition. The belief that high aspirations will encourage people to higher productivity has not worked with many of the lowland peasants in the Third World much less with the marginal agriculturalists. Instead, it has, among other factors, created some new values but the people's technological skills are still inadequate to satisfy such values.[3]

The Batak, the population under study, live under these new conditions. One anthropological problem arises: <u>Under these circumstances, how do the Batak manage to survive</u>?

Research Problem

In late 1960, James Eder (1971) collected demographic data on the Batak. His later conclusions indicated that the population has declined

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[2] There are mixed feelings concerning the sociocultural and economic implications of tourism in host countries (see Bryden 1973; Young 1973; Greenwood 1972; Boissevain 1978; Geshekter 1978; Valley 1978; Dommen 1971; and Mackey 1975).

[3] For its implications see Aberle (1962); and Parker et al. (1960).

(Eder 1977a). Such decline, Eder (1977b) contends, led to deculturation processes evidenced by the loss of some of their traditional ceremonies. This gradual depopulation is brought about by, among other factors, food stress due to the declining caloric return from their increasing participation in the monetized trade of commercial forest products (Eder 1977a; 1978). Due to the seasonal nature of their products, as we shall see later, the population experiences severe cyclical fluctuations of food. Eder's work, however, did not concern itself with this question: How do they manage to cope with cyclical food fluctuation?

While the Batak have responded technologically to the progressive gross caloric decline by intensifying the collection of commercial forest products and increasingly participating in wage labor and swiddening, they still have to contend with the severe cyclical caloric scarcity brought about by the seasonal availability of their resources. The overall caloric returns are reduced by the destruction of their habitat and the intensifying interethnic competition for these resources.

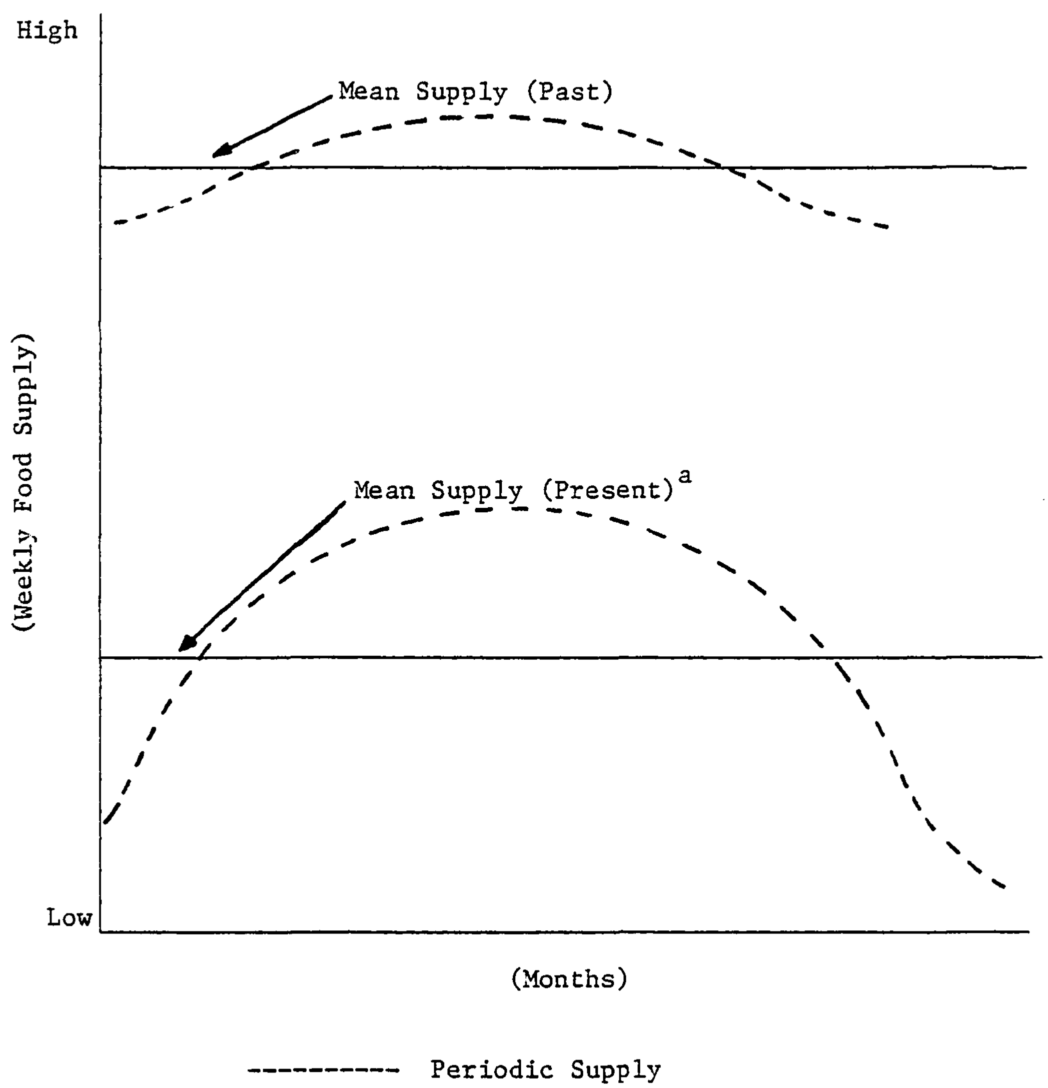
In 1903, there were approximately 1,400,000 hectares of forest land (Bureau of the Census 1905) in Palawan. The Bureau of Land in Puerto Princesa City recently reported that there are less than one million hectares left. In the period of eighty years, one-third of its total forest land has been wiped out. Agricultural occupation through frontier settlement (see Fernandez 1972; Raintree 1978; Huke 1963) and logging industries have been responsible for this. At present there are around 575,000 hectares that are concessioned to 20 different logging companies employing selective logging (PDS 1979). Studies show that faunal and floral populations are adversely affected by forest destruction (Harrison 1968; Hardjosentono 1978; Burgess 1971; Corvanich and Boonkird 1978).

Largely as a result of migration of different ethnic groups, the population in the Province has been reported to have increased at an annual growth rate, from 1970 to 1975, of 4.9 percent considered one of the highest in the country and the highest ever experienced by the Province.

The increasing sedentarism of the Batak and the continuous reduction of their forest land gradually stopped their traditional band splitting and fusing practice. These small bands used to move from areas of limited food resources to areas of relative abundance. The cessation of this practice brings a more severe caloric decline to the population during periods of scarcity. The following graph shows the theoretical difference between the past and the present household food supply condition of the Batak (see Figure 1).

The past shows a higher mean household food supply with a shallower seasonal decline in contrast to the present having a lower mean with deeper fluctuations. The present overall food stress is more severe than the past and the problem is compounded by a rather acute cyclical fluctuation. I submit that besides the population's problem of overall caloric scarcity, another serious problem is how to acquire a fairly constant supply of food over time (Jochim 1981: 35).

This problem exposes the population to the threat of malnutrition or even starvation during periods of severe caloric stress. If "alternative energy sources" or "stored food" are available (Jochim 1981: 36), however, the people could tap them during these periods. But in the



[a]Theoretically, the present food situation can be expected since the decline in the diversity, density, and stability of resources increases the frequency and severity of food stress (Hayden 1981b: 413).

Figure 1

Batak Household Food Supply Conditions
During Two Different Time Periods

absence of these resources, the only available energy source is "shared food" (Jochim 1981: 36). Through food exchange, this energy source may be mobilized from the "haves" to the "have nots."

Food exchange may take different forms: trade, interethnic reciprocity (Peterson 1978), intervillage reciprocity (Johnson and Bond 1974), and interhousehold food sharing[4] (Brady 1972; J. Henry 1951). By trade, a population makes its own products (such as commercial forest products) available to another population or individual and while using a price system, such products are either converted into cash or other goods-in-kind of equivalent price. The Batak are increasingly participating in such trade but evidence indicates (Eder 1978) that they are getting less caloric return from it than from their traditional subsistence activities.[5]

Interethnic reciprocity implies a mutual act of food giving and taking between two or more ethnic groups without having any pricing system. My field experience indicates that interethnic reciprocity between the Batak and the other ethnic groups is nil and does not contribute in any way to their food supply. Although such a practice took place in the past (Warren 1964) as the monetized system of the national economy penetrated the area, then trading probably replaced it.

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[4]Intrahousehold food sharing may help minimize household food problems by apportioning food to household members according to their needs. For instance more food may be given to lactating mothers, sickly members, and young children while limiting amounts to healthy ones (also see Colson 1979 and Dirks 1980). In my sample households the difference in the quantity and quality of food given to these individuals is not substantial.

[5]Although the system has provided credit lines to wild resin collectors (also see Jochim 1981: 113), the credit practice involves an exorbitant interest which further reduces the caloric input-output ratio from collecting commercial forest products.

Intervillage reciprocity involves the participation of the same ethnic group situated in different geographical areas. At present, in Palawan there are five major Batak villages located far apart. Resource availability in these areas is essentially the same, and if they differ at all, it is just a matter of degree. Due to the distance between villages and their virtual similarity in resource conditions there was no evidence of intervillage flow of food during my field work.

Interhousehold food sharing is limited to the same village. This does not, however, necessarily preclude occasional food items coming from a different village via one household which may in turn be shared with other households. But as cited earlier, such a practice is virtually nonexistent. A substantial amount of food was circulating in the village through interhousehold food sharing. My thesis therefore is: <u>Interhousehold food sharing is a major part of the Batak's system of food management and is a coping mechanism which households employ to meet cyclical food stress</u>. As a compensatory mechansim to cyclical food scarcity, interhousehold food sharing "is increasingly likely when . . . residential mobility becomes increasingly difficult" (Jochim 1981: 186).

There are two possible options for the household when food is scarce: (1) keep food for private consumption; or (2) share food with other households. The choice is largely determined by the intensity of food scarcity or availability. The content, structure, timing and intensity of interhousehold food sharing are affected by a number of factors such as level of food production in the household, demographic structure of the household as influenced by family life-cycle stage, geographic distance between households, kin relation, mode of food sharing, and the nature of food involved. A number of specific questions are raised:

(1) What are the processes involved in interhousehold food sharing?

(2) In what context is food shared? What are the factors that affect the nature, content and intensity of interhousehold food sharing over time, and during a specific period in time?

(3) Does interhousehold food sharing have any adaptive functions?

(4) How is interhousehold food sharing integrated with the food procurement system in general?

To explore these questions with sufficient depth, some theoretical issues are used as a framework for the analysis.

Theoretical Issues

There are two contrasting paradigms, to borrow Kuhn's (1970) concept, that serve to organize a host of anthropological data into a set of anthropological theories. The structuralist/symbolist perspective, on the one hand, assumes that the "distinctive quality of man [is] not that he must live in a material world, . . . , but that he does so according to a meaningful scheme of his own devising, in which capacity mankind is unique. It therefore takes as the decisive quality of culture . . . not . . . [to] conform to material constraints but that it does so according to a definite symbolic scheme" (Sahlins 1976: vii). Human behavior is therefore a manifestation of the "social fact" (Durkheim 1951) considered to be a "collective" reality (Sahlins 1976: 107), "symbolically constituted" (Sahlins 1976: 121). The collectivization of human behavior is rooted in the human "<u>conscience</u> as opposed to desire, conventional as opposed to spontaneous, and rather than originating in wants, which are internal, it imposes itself as constraints, which are external" (Sahlins 1976: 107). This collective control is structured. Levi-Strauss believes that

> . . . there is always a mediator between praxis and practices, namely the conceptual scheme by the operation of which matter and form, neither with any independent existence are realized in structure . . . (1963: 130).

Man therefore largely behaves in conformity with the norms and traditions (Levi-Strauss 1969; Radcliffe-Brown 1952; Mauss 1954; Durkheim 1951). Sahlins (1976:105) clearly expressed this when he quoted White:

> Between man and nature hung the veil of culture, and he could see nothing save through this medium. . . . But permeating everything was the essence of words; the meanings and values that lay beyond the senses. And these meanings and values guided him--in addition to his senses--and often took precedence over them. (1958 ms)

On the other hand, the utilitarian awareness of the materialist perspective looks at human behavior as an expression of the individual's positive response to the physical reality of his "earthly existence" (Harris 1979: ix). His behavior, as the historical materialists would qualify it, "correspond(s) to a definite stage of development of [the] material powers of production" (Marx 1904: 11). For Harris (1979: 53), it is not only the "modes of production" but also the "modes of reproduction," which he calls <u>infrastructure</u>, that "probabilistically determine" the complexity of the sociocultural system. Cultural materialism is therefore a form of determinism. Aside from its "principle of infrastructural determinism" (Harris 1979: 56), it also "opposes strategies that deny the legitimacy [in the] determinism [of the] human affairs" (Harris 1979: ix). The structural/symbolic aspect of human behavior is completely irrelevant since the cultural materialist "opposes . . . strategies that set forth from words, ideas, high moral values, and aesthetic and religious beliefs to understand the everyday events of ordinary human life" (Harris 1979: ix). The individual therefore takes complete responsibility over his choice of action unlike in the former where one has to deny individuality in favor of a collective social conscience and control which Spencer (1961) has described as "superorganic" and which Durkheim (1951) says is the responsibility of "society." His behaviors are adjusted to meet particular life demands during a specific point in time precisely for material maximization (Harris 1979: 137).

Sahlins in his book, Culture and Practical Reason, succinctly states:

> The alternatives in this venerable conflict between utilitarianism and a cultural account may be broadly phrased as follows: whether the cultural order is to be conceived as the codification of man's actual purposeful and pragmatic action; or whether, conversely, human action in the world is to be understood as mediated by the cultural design, which gives order at once to practical experience, customary practice, and the relationship between the two . . . . In the first case, culture is an instrumental system, in the second, the instrumental is subjected to system of another kind. (1976: 55-56)

The distinct contrast between the cultural materialist on the one hand (Harris 1979) and the structural/symbolic (Levi-Strauss 1969; Durkheim 1951; Mauss 1954; Sahlins 1976) on the other has created a binary classification of the ways human behavior can be analyzed. Human behavior is complex, however, and therefore cannot be dichotomized. It can neither be explained purely on the basis of the material gains one can acquire, nor by the way the human mind perceives a situation on the basis of socially shared meanings and rules (Mauss 1954; Levi-Strauss

1969). To explain human behavior based exclusively on either model is reductionism and misses the intricacies of culture. It appears, therefore, that a framework of analysis that links the thinking of these two models will yield a more realistic interpretation of human behavior. Cultural ecology[6] provides this link since it studies the

> . . . relations among the population dynamics, social organization, and culture of human populations and the environment in which they live . . . . In many cases, systems of production constitute important links among population dynamics, social organization, culture and environment. (Orlove 1980: 235)

It was also Harris (1968:655) himself who claims that "cultural ecology . . . links emic phenomenon (symbolic) with the etic conditions (materialists) of 'nature' . . . ." In an attempt to reconcile the materialistic and the symbolic implications of the way the Tukano Indians of the Colombian Northwest Amazon viewed the cosmos, Reichel-Dolmatoff (1971) employed the cultural ecological approach. This is very clear from the later paper he read at the Huxley Memorial Lecture in 1975 (also see Sponsel 1982b: 1):

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[6]Although Johnson (1981: 20) accused cultural ecology of committing reductionism to a certain degree, he himself accepted that it is very much lesser than that committed by the structuralism of Levi-Strauss (1972). Levi-Strauss (1972: 7) attempted to discover how "human history and natural ecology can become articulated so as to make up a meaningful whole." Johnson (1981: 20) criticized that he (Levi-Strauss) is "so uninterested in the ecological facts . . . that . . . he . . . reduced ecology to something so peripheral it hardly catches his attention." Cultural ecology attempts to explain human adaptation in the context of the natural and social environments of man. Unlike natural ecology, from which the concept of ecology originally developed, cultural ecology should never be reductionistic. While the first emphasizes energetic management in a given natural environment (explaining everything by the natural laws), the second stresses energetic and social management in a given social and natural environment for adaptation. It recognizes the issue of human survival as complex that it can neither be reduced into a purely natural nor symbolic phenomenon.

> . . . my chief concern will be to trace some connexions that exist between the cosmological concepts (symbolic) of these Indians, and the realities of adaptation to a given environment (materialistic). In doing so I shall try to demonstrate that aboriginal cosmologies and myth structures, together with the ritual behavior derived from them, represent in all respects a set of ecological principles and that these formulate a system of social and economic rules that have a highly adaptive value in the continuous endeavour to maintain a viable equilibrium between the resources of the environment (materialistic) and the demands of society (symbolic). (Reichel-Dolmatoff 1976: 308)

Cultural materialism should not necessarily be equated with cultural ecology. While cultural ecology does not deny the cultural materialist's premise that "human social life is a response to practical problems of earthly existence" (Harris 1979: ix), it does not necessarily employ such a premise as an "a priori" interpretation of human behavior. Cultural ecology does not necessarily "ascribe to the primacy of the technological and economic components of the cultural system," a major tenet of cultural materialism (Sponsel 1982a: 3). Cultural materialism attempts to explain the "why" of human behavior. Cultural ecology describes the specific behavioral processes in the context of man's "web of life" (Steward 1955: 31). It examines how the sociocultural system affects human behavior and at the same time tries to seek the material meaning as man relates himself with his environment. Sahlins, quoting Murphy (1971), observes:

> The theory and method of cultural ecology is not a kind of environmental determinism, nor is it even centrally concerned with the environment. It is a cultural theory, without being "culturalogical" or "superorganic." Further, it is an action theory . . . . While recognizing that behavior is in good part regulated by norms, it also sees the norms as arising in the first place from social action and being a crystallization of behavior that, in turn, maintains these behavior patterns . . . . (1976: 98)

Cultural ecology studies the processes of human behavior in their "natural and social settings and of their relationships to these settings" (Jochim 1981: 3). This is apparent in Vayda and Rappaport's (1976:12) work:

> The view is taken that "cultural ecological adaptations" are not merely permitted by the environment but "constitute creative processes," . . . . The implication is that the origins of some (even if not all) particular cultural features can be discovered through the study of relationships between culture and its contemporary environment.

Cultural Ecology and General Systems Theory: I opt for the cultural ecological approach for three reasons. First, it provides a "materialist examination of the range of human activity" (Orlove 1980: 235) while it explores how the sociocultural system bears upon man's behavior. Second, its reasoning is inductive unlike the other two. It analyzes human behavior as a situation and describes it on the basis of the sociocultural and ecological context. It is therefore free from an "a priori-bound" interpretation as brought forth by either a materialist or a structural/symbolic theoretically based model. And third, human behavior is dynamic. The diachronic and processual approach (Orlove 1980: 245-246) of cultural ecology handles efficiently the process and situational (Vayda et al. 1980) dimension of human behavior.

The cultural ecological approach draws heavily on general systems theory which is a holistic way of viewing complex social organization. A system may be defined as a "set of elements standing in interrelation among themselves and with the environment" (Bertalanffy 1972: 31). Two levels of relationship are involved here: relationship between objects or elements per se; and, relationship between attributes of objects or elements (Hall and Fagen 1968: 81). A unit in a particular system is "definable only by its cohesion in a broad sense, that is, the interaction of the component elements" (Bertalanffy 1972: 37). The link between these elements to the environment posits the "concept of the open system . . . whose structure is maintained by a continuous energetical and informational flow between the systems and its environment" (Klir 1969: 97). This energetical and informational interchange between the social system and its environment is an "essential factor underlying the system's viability, its reproductive ability or continuity, and its ability to change" (Buckley 1967: 50). The significant changes that may occur in the nature and content of the components will have relevant consequences for the total configuration of the whole system (Buckley 1968: 490).

Essentially, three distinct models have emerged in analyzing social systems using general systems theory: the mechanical or equilibrium model; organic or organismic homeostatic model; and the process or adaptive systems model (Buckley 1967: 8-40).

Cursory investigation of these models shows that the "process model" would provide the most useful tool in the analysis of human adaptation to cyclical food stress.

While the first two models do not provide opportunities for change for the social system, the process model allows for the system an "elaboration or evolution of organization" which largely depends on the "disturbances" or "varieties" in the natural and social environments. The model assumes that the social system is in motion which involves a series of changes to meet various degrees of social and environmental demands. Buckley writes:

> . . . the process model typically views society as a complex, multifaceted, fluid interplay of widely varying degrees and intensities of association and disociation . . . , societies and groups continually shift their structures as adaptation to internal and external conditions. Process, then, focuses on the action and interactions of the components of an on-going system, such that varying degrees of structuring arise, persist, dissolve, or change. (1967: 18)

The Batak society, just as any other living society, is systematically organized. It is a system in motion whose members calculatively choose a specific mode of action in managing food as they relate themselves (in a kind of feedback relation) to a complex web of interrelated factors such as demographic trends, food production opportunities, environmental changes, resources, and sociocultural factors. The process is continuous and the nature of chcice, over a number of means to achieve various ends relative to changing constraints, varies over time.

To facilitate adjustments to constraints such as food stress, a social system has its own adaptive infrastructure. It constitutes a complex set of mechanisms a population employs in the "processing of energy and information necessary for the . . . survival of the population" (Laughlin and Brady 1978: 3). For analytical purposes, Laughlin and Brady (1978) distinguish three interconnected subsystems in this infrastructure: the neurobiological; the cognitive; and the societal subsystems. The first consists of the nervous and other biological endowment of the population while the second comprises the mental mechanism for processing materials perceived by the physical senses. The societal subsystem is a mechanism for organizing individual's cognitive resources which translates the "symbolic and meaningful information in [a] culture pool, including economic, political, social and ideational content" (Laughlin and Brady 1978: 4) into behavioral expressions.

These subsystems are systematically organized such that their responses to the various stimuli "from other levels within the organism or from outside the organism as environmental stimuli" (Laughlin and Brady 1978: 3) can be coordinated and synchronized. The flow of energy and information between these subsystems provides the link between them producing a coordinated response.

This study focuses on the societal subsystem while viewing it in its ecological context. It looks at it as the essential mechanism which the population mobilizes given the other two subsystems (neurobiological and cognitive). Under this assumption the Batak household is investigated as a "social unit" whose major concern is how to get "people to resources and resources to people "(Laughlin and Brady 1978: 7). Although in practice these are not mutually exclusive, again for analytical purposes, Laughlin and Brady (1978) identify four domains in this subsystem: economic, political, social, and ideological. The socioeconomic goals of the population are achieved through these domains.

The social domain may provide an equitable allocation of food to the population. Some sociocultural reinforcements (Jochim 1981: 179) such as norms and other social controls facilitate, but do not necessarily control, the distribution of these resources. In the process of allocating resources, social elements like power and interpersonal relations enable the individual to perpetuate, re-adjust, renew and establish new alliances for a satisfactory day-to-day living.

> The basic adaptive functions of the primary social domain are to provide: (1) the channels through which basic resources and derivative products are distributed for consumption or reallocation by the population; and (2) the potential structure for amity, altruism, sociability, corporate action, . . . , alliance, and cooperation in such strategic enterprises as shared labor and defense. (Laughlin and Brady 1978: 10)

The Ecology of Interhousehold Food Sharing and Food Management: When food is shared, other social elements such as privileges and obligations are involved. Food is therefore the pivotal item in the economic transactions among marginal agriculturalists (Stevenson 1968; Waddel and Krinks 1968; Brady 1972; Heinen and Ruddle 1974; Butt 1977; Marshall 1961).

Food sharing or food "exchange" (Sahlins 1965), food "reciprocity" (Malinowski 1922), or food "gifts" (Mauss 1954) has been explored on the basis of the people's tradition and rules. The motives, the consequences and the processes involved in the transaction are interpreted as mechanisms to preserve social solidarity (Durkheim 1949). Sahlins (1965) puts his three types of exchange--"generalized," "balanced," and "negative"--in a continuum to portray the nature of a social relationship that changes from a highly personalized to a highly impersonalized one. Malinowski's interpretation of reciprocity largely anchors on the rules prescribed by the Trobriand society. Mauss' "total prestation" (gift) emphasizes the social obligation to reciprocate. One thing is common to these studies: the transaction is largely viewed as a result of the rules established by the social system. It appears as a static phenomenon. In reality, however, food sharing is more of a process than an outcome per se, since it involves a self-sustaining individual exercise of giving and taking in which participants do not behave in a single pattern but in various ways in response to the different structure, content, and degree of socioecological conditions over time.

The static approach to the study of exchange, such as food sharing has led to an overemphasis on the gross motives for giving and receiving (Homans 1974; Blau 1964; Thibaut and Kelley 1959), and the social rules affecting such kinds of behavior (Malinowski 1922; Mauss 1954; Levi-Strauss 1969; Polanyi 1971; Radcliffe-Brown 1952). This approach creates the false impression that human behavior is not dynamic so that human responses become inflexible despite the changing life conditions and ecological situation. The context and the rationale of why social exchange takes place at a specific point in time will therefore be missed. The belief that human behavior is explainable only in terms of norms, traditions and the need to preserve the integrity of the social system alone can subjugate man's capability to control over his life. This makes culture a mere articulation of the social code rather than a device he can use to organize the social codes to his own advantage. In actuality, social codes allow flexibility so that order can be established as new socioecological settings and contexts emerge.

When do people share food? Rosman and Rubel (1971) in their study among the Northwest Coast American Indians concluded that food is shared during certain "critical social junctures" in their lives such as birth, marriage, and death. Piddocke (1965), Suttles (1960), and Vayda (1961) studying the same groups of people and asking the same question have reached different conclusions. The Northwest Coast American Indians potlatch when one of the groups is experiencing food stress. When one village has plenty and the other has none, potlatching takes place between them. Rosman and Rubel's (1971) study depicted a strong normative overtone when the behavior is interpreted as a way of maintaining social solidarity during periods of social stress while Piddocke (1965), Suttles (1960), and Vayda (1961) interpret the behavior as an ecological adaptation to food scarcity. One thing is apparent in these studies. The analysis is focused on the response of the total population to socioeconomic stress. Food sharing, however, is not always a group response. It could also be an individual one. In fact, it would be more practical and appropriate to analyze the behavior on an individual basis because although his choice may be mediated by the existing social rules, the individual makes his own decisions when faced with various alternatives. The social system provides options (Orlove 1980: 246; Firth 1951; 1954; 1964) from which the individual can make his own choice. Therefore, individuals would have highly varied choices. Ethnographic evidence on peasant farmers' agricultural practices show a high level of individuality and variation.

> The observation I have made among swidden agriculturalists in Northeastern Brazil are unequivocal: these farmers differ from one another to the point that every household's configuration of land types, and the crop mix within them, is uniique to that household . . . . (Johnson 1972: 151)

Other ethnographies which claim general uniformity of individual behavior reflect in their very own data a large amount of unexplained variability in individual practices. G. Foster's (1948) work on the agricultural practices of the Tzintzuntzeno and Tax's (1953) among the Guatemalan farmers showed varying practices on the proportion of seeds planted per acre of field, spacing of plants, and the kinds of seeds used. This evidence reflects the range of selection individuals have in responding to a number of factors. The choices generally favor those that are assumed to provide maximum security but not necessarily maximum return. Johnson's field data of the sharecroppers in a Brazilian plantation support this claim:

> In their agriculture, and in their social relations, their behavior is directed almost entirely toward meeting basic subsistence needs; they do not do things in a certain way "because things have always been done that way" but rather because this way will work reliably to assure survival . . . . Social relations, too show this orientation toward security. . . . Finally, even with landlords the workers can distinguish two alternative kinds of relationship: one that is personalized and protective but costs more in payment of shares and general dependence, and one that is impersonal and nonprotective but costs less. Although the workers cannot always choose the kind of landlord they work for, those I questioned consistently described the costlier, but low risk alternative as the more desirable. (1971a: 132, 136-137; emphasis mine)

Food sharing is sensitive to a number of factors, one of which is food availability. The fluctuation in food supply involves corresponding modifications in the content and structure of food sharing. Food keeping may likely follow when there is an unremitting food scarcity. This extreme food deprivation could even lead to the establishment of a "non-social" system where most of the elementary functions of "sociality becomes extinct for all intents and purposes" (Turnbull 1978: 75) to allow the people to survive.[7] The IK demonstrate an operating desocialized system where most of the evidence of the elements of "social cooperation" no longer exist (Turnbull 1972). Other authorities, however, believe that long exposure to this situation could develop gross stress on the population that leads to a form of psychopathology that greatly impairs the population's adaptive system (Cawte 1972; 1978: 95-121).

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[7]For critique of this analysis, see Barth (1974) and Knight (1976).

In the end food production will be so affected that the group's very own survival may be threatened and the food shortage may eventually lead to the biological extinction of its members.

In a case where deprivation is not constant but marked by regular and cyclical periods of better food supply conditions, "social cooperation" may not entirely disappear. It may only modify the mode, structure, content, and intensity of food reciprocity and exchange behavior (Laughlin 1974).

The variation in the structure, content, and intensity of inter-household food sharing may be caused by a number of factors, such as season of the year, food production opportunities, and, of course, the return. The theory proposed by Laughlin is relevant to consider here:

> Reciprocity in primitive society may be seen as existing on a continuum from generalized to negative at the poles. Generalized reciprocity is commonly correlated with long term maximization of payoffs having little or no immediate utility and with exchange between individuals of close kinship and residential proximity. Negative reciprocity is commonly correlated with short-term maximization of payoffs having relatively great immediate utility and with exchange between individuals of relatively distant residential proximity. In any primitive society which is confronted by a progressively deteriorating economic situation so that payoffs of immediate utility become more limited in type and scarce in quantity, reciprocity between individuals of close kinship and residential proximity will increasingly be marked by short-term maximization of payoffs of immediate utility and will become either negative or non-existent. (1978: 82-83)

The periodic decline of the food supply is a problem hunters and collectors have been trying to solve since the Pleistocene period (Hayden 1981a; Butzer 1980). Sahlins' description of the hunters and gatherers as the "original affluent societies" in his Stone Age Economics (1972) is suspect since contemporary data on hunters and collectors reveal that these groups still have to face cyclical food stress (J. Peterson 1978; Silberbauer 1981; Harako 1981; Hayden 1981b; Gould 1981; Wiessner 1977: 4). Today, hunters and collectors are transformed into a new breed, known as marginal agriculturalists in this study. They no longer solely live on hunting and collecting but also on swiddening, wage labor, and the sale of commercial forest products. Caloric return analysis such as among the Batak in Palawan by Eder (1978) showed that this new form of subsistence is less calorically profitable than their traditional pure hunting and collecting system. Furthermore, since contemporary hunters/collectors and marginal agriculturalists generally occupy the marginal land areas, food productivity leaves much to be desired when compared to that of their counterpart, the past hunters and collectors. Hayden (1981b: 413) indicates "that the frequency and severity of stress seem to increase as resource diversity, density, and stability decrease."

Three conditions are revealed in these data. (1) The food supply of this population both in the past and the present is not characterized by sustained surfeit but by periodic or cyclical fluctuation. (2) While the food supply in both periods fluctuates, that of the present does so more frequently and intensely than that of the past. (3) Contemporary hunters/collectors and marginal agriculturalists not only have to cope with the overall problem of limited food supply but also and more importantly, <u>they have to face the more severe problem of how to handle the highly stressful cyclical food scarcity</u> (Jochim 1981: 35).

It appears that the Batak have responded to these two types of food problems in different ways. For the overall problem of limited food supply caused by the disentegration and the disappearance of some of their traditional food sources, they responded technologically. By intensifying their collection of the commercial forest products, participation in the wage labor market and increasing the acreage of their swidden fields they are able to compensate, in absolute terms, for the caloric loss caused by the resource decline. This strategy, however, resulted in a lower input-output caloric ratio (Eder 1978). Another technological response which has seemingly helped them handle both the overall decline and the cyclical food problem is the practice of planting their fields at different periods which accordingly are harvested at different times. Wastage due to lack of manpower is prevented as harvesting is done by turn. Therefore, interhousehold food sharing still makes sense even during harvest time, while it has minimized the effects of cyclical food scarcity.

Very recently, the food reliability model has been strongly supported by Hayden (1981a) to explain technological evolution. He argued that the attempt to "increase resource reliability" was essentially brought about by the "episodes of resource stress that occurred within the same range of frequency throughout the Pleistocene" (Hayden 1981a: 528). Although he seems to think that these "episodes" occur at a relatively long interval, I would say that these episodes may also occur at shorter intervals, an idea supported by Butzer (1981: 531). He claims that "resource stress can be a critical factor in the modification of regional adaptive systems by behavioral or technological accommodation, but over much <u>briefer time intervals</u> than those invoked" by Hayden. One of the issues therefore is <u>how to maximize the reliability under a highly fluctuating food supply condition. By</u>

maximizing its reliability, one conversely minimizes food stress. How is this achieved?

Hayden's (1981a: 522) "Resource Stress Model" largely posits technological change as a way of sustaining food supply over time. He looks at it in terms of the diversity and the nature of the food resources people use from one point in time to another. This, of course, depends on the "perception of the people as to the species (plant and animal) that would be most worthwhile to exploit . . . and the technological base" (Hayden 1981a: 524).

However, the technological change approach to improving food reliability among marginal agriculturalists is, both in theory and practice, inadequate. There is, of course, no doubt that changing the procurement system may be perceived by the people as the most suitable way to minimize the stress. However, in actual socioeconomic life, other aspects of the population's adaptive infrastructure should never be overlooked as a means of grappling with these periods of brief food stress. Jochim (1981: 36) concluded that among a human population, "shared food" is one of the varieties "of energy source." This resource is mobilized by using the social system (also see Dirks 1980; Colson 1979) which diffuses food resources from a point of higher concentration (this could be a household or a village) to a point of lower concentration (another household or another village). Wiessner (1977: 11), in her study among the !Kung San concluded that food sharing (hxaro) lowers the risk of hunger or starvation in a situation where stored and other alternative resources are not available. I therefore claim that the social system serves no less than the technological system as an adaptive response to cyclical food stress.

One of the social mechanisms commonly cited as a way of responding to cyclical food stress is the flexibility of band composition (Lee and DeVore 1968; Lee 1965; Anderson 1968; J. Peterson 1978; Birdsell 1958). The fluidity of the band "allows a community to distribute its personnel relative to resources, thus assuring the group of a daily food supply" (Peterson 1978: 21). This regular shift of residence is commonly known as "circular migration" (Chapman 1970) or simply "circulation" (Zelinsky 1971; Mitchell 1961). The movement is characterized by "periodicity" (time) and "oscillation" (area) generally determined by the availability of resources in these areas (Chapman 1970: 172). "Such movement ultimately terminates in the place or community in which it began" (Chapman, in press). For marginal agriculturalists whose geographical area of occupation is being increasingly reduced and whose technology is constantly making them sedentary, the mechanism of circular migration loses its value. <u>In the light of the increasing sedentarism of the marginal agriculturalists, I further submit that the other option open to them in the social system is interhousehold food sharing</u>.

It is only in the last two decades that food exchange has been viewed as an adaptive tool man employs to minimize food stress (Gould 1981; Suttles 1960; Vayda 1961; Piddocke 1965; Jochim 1981). J. Peterson's (1978) study of a hunting/collecting society in the Philippines and that of Stack (1970) among the poor urban black American also showed the adaptive relevance of food sharing to food problems.

The ecological perspective on food sharing has been largely treated and analyzed on an intervillage or interterritorial level. The "food zone," the "microenvironment," and the "territorial" concepts as the ecological points which are linked by energy flow are the focus of the analysis (J. Peterson 1978; Suttle 1960; Vayda 1961; Piddocke 1965). The emphasis on intervillage and interterritorial food sharing stems from a number of assumptions: (1) The schedule of food availability in these villages differ since they vary in resource structure and content (B. Foster 1978: 12; Lombardi 1975). (2) Each population group has territorial limits; i.e., boundaries, beyond which the population no longer has access to the food resources (Klopfer 1969; Kummer 1971; Birdsell 1958: 190-191; Barth 1965; Radcliffe-Brown 1931). (3) The household is not a relevant point where food sharing can be analyzed if it is viewed as a stationary social unit whose food production capability and food needs do not change. By the same token all households in the village are consequently viewed as having a similar level of food supply, and the only way to augment the food supply in the households during food stress would be to take food from other villages or territories.

These assumptions face a number of problems. First, in many cases, neighboring territories are not actually differentiated by the resources available in these areas. One such case is found in the Batak villages of Palawan, Philippines. J. Peterson (1978) similarly claims that the three Agta territories in Palanan, Philippines have practically the same resources and that "they only differ in degrees." Second, empirical evidence shows that most hunters and gatherers do not have any clear territorial boundaries (Lee and DeVore 1968: 8; Anderson 1968: 154; Lee 1968a: 157; 1968b: 31; Steward 1968: 333; Woodburn 1968) and movement across boundaries is common (Lee 1968a: 157; Hiatt 1968: 100; Marshall 1976: 131). The natives do not necessarily claim absolute rights to these resources. In fact, among egalitarian societies such as the Batak, these resources are supposed to be for everybody. It is actually geographical inaccessibility and absence of manpower in the household that keep one group of people from utilizing resources in another geographical area.

Third, the household is not actually a static social unit but a dynamic one such that both its food production capability and food needs change over time (Goody 1971; Duvall 1977; Glick 1977; Gove et al. 1973; Hareven 1974; Rodgers 1973; Miller 1976). In times of increasing food stress, households with adequate labor supply due to their favorable stage in the family life-cycle have a better chance of deploying labor to farther microenvironments which, under normal food conditions, may not be tapped. Since there are no rigid territorial boundaries and no single population group has exclusive and absolute right to these resources, food problems are therefore mainly technical. Since households in the population will fall under various family life-cycle stages, some households will produce more while others will produce less at the same point in time. Colson explicitly propounded this idea when she claimed:

> In any one year, some families, because of peculiar circumstances, will face shortage, but they can be maintained from the surplus produced by other members of the community. Even in bad years, some food is likely to be harvested, and some (households) will harvest more than others. (1979: 25, emphasis mine)

Why do some households have more food than others? Colson did not pursue that question. I propose that the difference in food supply among households is brought about by the changes in their family life-cycle stage. Family life-cycle stage does not only bring changes in the household labor supply but also in its caloric needs. During certain stages of the life-cycle, a household will therefore have a favorable labor supply while its caloric needs are low. Studies on caloric needs of various age groups of male and female individuals show a decline when they pass the age 19 and 15 respectively (FNRI 1980: 304). Since family life-cycle stage is positively correlated with the age of the household members, the household caloric needs decline in the later life-cycle stage while food production capabilities of household members theoretically increases as they grow older, remains stationary at the middle age, and declines only at a very much later age than when the caloric needs start to decline (Lorimer 1967). Indeed, among hunters/collectors and marginal agriculturalists, the household labor supply is a very critical factor in food production.

However, in theory and practice, the analysis of interhousehold food sharing cannot be properly done unless it is seen as an integral part of the total food procurement system (Flannery 1968) of the population. Food management is a total socioeconomic package, and food sharing is an important part. By the very nature of their technology, marginal agriculturalists have access to a good number of resources. These are: wage labor from working for the lowland peasants' farms; riverine and marine products; cultivars from their swidden fields; and commercial and subsistence plant products and game animals from both virgin and secondary forests. The areas where their food procurement activities take place constitute "microenvironments" (Coe and Flannery 1964: 75) characterized by their peculiar resource content and structure. The "scheduling" (Flannery 1968: 75) of their food procurement activities which is a behavioral response to the seasonal characteristic of their resources can lead to seasonal variations of interhousehold food sharing. Likewise, the various degrees of accessibility of households to these microenvironments have definite effects on household food production. Depending on its labor supply, a household may either be a potential food giver or receiver at one time or another. The message here is clear: <u>Exchange, such as food sharing as well as the employment of food maximizing strategies, should be viewed according to the temporal and spatial dimensions of the ecosystem</u>.

CHAPTER II

METHOD AND FIELD RESEARCH TECHNIQUES

Method

In investigating food sharing behavior, the household constitutes an appropriate unit of investigation. The household is the point where food is mobilized and where choices are made concerning socioeconomic ends to be achieved given possible means. It is viewed as the actor. The data collected at this level provide several advantages:

> . . . [they] account for a wider range of social organization than [other] models do; [they] permit a more precise analysis of the parameters of behavior and the variation of behavior within populations; [they] admit more readily to an examination of conflict and competition; and [they] offer the potential of examining change through an analysis of the process which generates economic, political, and social relations. (Orlove 1980: 246)

The actor-based model which focuses on the household or individual behavior is different from the "pure economic model of rational choice." In the latter the attempt is to "explain" (Heath 1976: 173) the behavior while the model proposed here describes the behavior of the individual in a specific socioecological context, it is situational (Vayda 1980). Unlike the aggregate social model which looks at the human behavior as an "interpretation" (Heath 1976: 174) of the social "meanings" (Mauss 1954) and "rules" (Levi-Strauss 1969), the actor-based model views the individual behavior as a response to his environment while he relates himself to the sociocultural factors. It is systemic and it allows a "reactive" (Heath 1976: 176) framework of analyzing interhousehold food sharing.

The nature of the problem and the theoretical framework proposed in this study demands a micro diachronic approach in which case one whole agricultural cycle has to be investigated. In this way, a complete cycle of periods of relative abundance and scarcity of food is observed at a micro level. Using this method, the changes in the pattern of interhousehold food sharing can be determined in the context of the changing household food supply condition at least during one agricultural year.

The "situational approach" (Vayda 1980: 186) or the "processual" approach (Orlove 1980) in cultural ecology meets our analytical needs. The processual method examines

> . . . shifts and changes in individual and group activities, and . . . focus(es) on the mechanisms by which behavior and external constraints influence each other. (Orlove 1980: 245)

The situation approach as a research strategy

> . . . focuses on situations . . . [committed] to the holistic premise that problems can only be understood if they are considered part of a complex of interacting causes and effects . . . . The approach . . . includes identifying particular behaviors that affect or can affect the [situation] and then attempting to understand those behaviours by analyzing the situations in which they occur. Starting with a particular human behavior, we trace the complex of relevant influences and impacts outward, obtaining, in the end, an understanding of the important factors that must be attended to by the relevant factors. (Vayda et al. 1980: 186)

Field Techniques

The research method just outlined was translated into different techniques in the field for fourteen months, from April, 1980 to May, 1981. The first two months were largely spent in collecting demographic data while the rest were used for gathering ethnographic information.

The data were gathered by observation, interviews, participation, and experimentation. The general procedure for collecting the data is treated in this chapter while the specific procedures will be treated along with the data as they are presented in the discussion in the following chapters.

Demographic Data: Three complementary techniques were employed. (1) Birth dates were established through "social triangulation" (Appell 1969: 87) by taking into account known social or historical events occurring at the time of birth or age period of a person in question. (2) For births or age period with which no significant events are associated, "relative age" procedure (Howell 1976: 32) was used. By the relative age procedure, individuals whose ages are uncertain were compared with those whose ages are surely known. In the process the relative birth periods of those having unknown birth dates were established. (3) The ages established by these methods were corroborated by using the "panel procedure." This is done by asking a group of adult men and women the approximate age of a person they know very well. A consensus opinion is sought to establish the age.

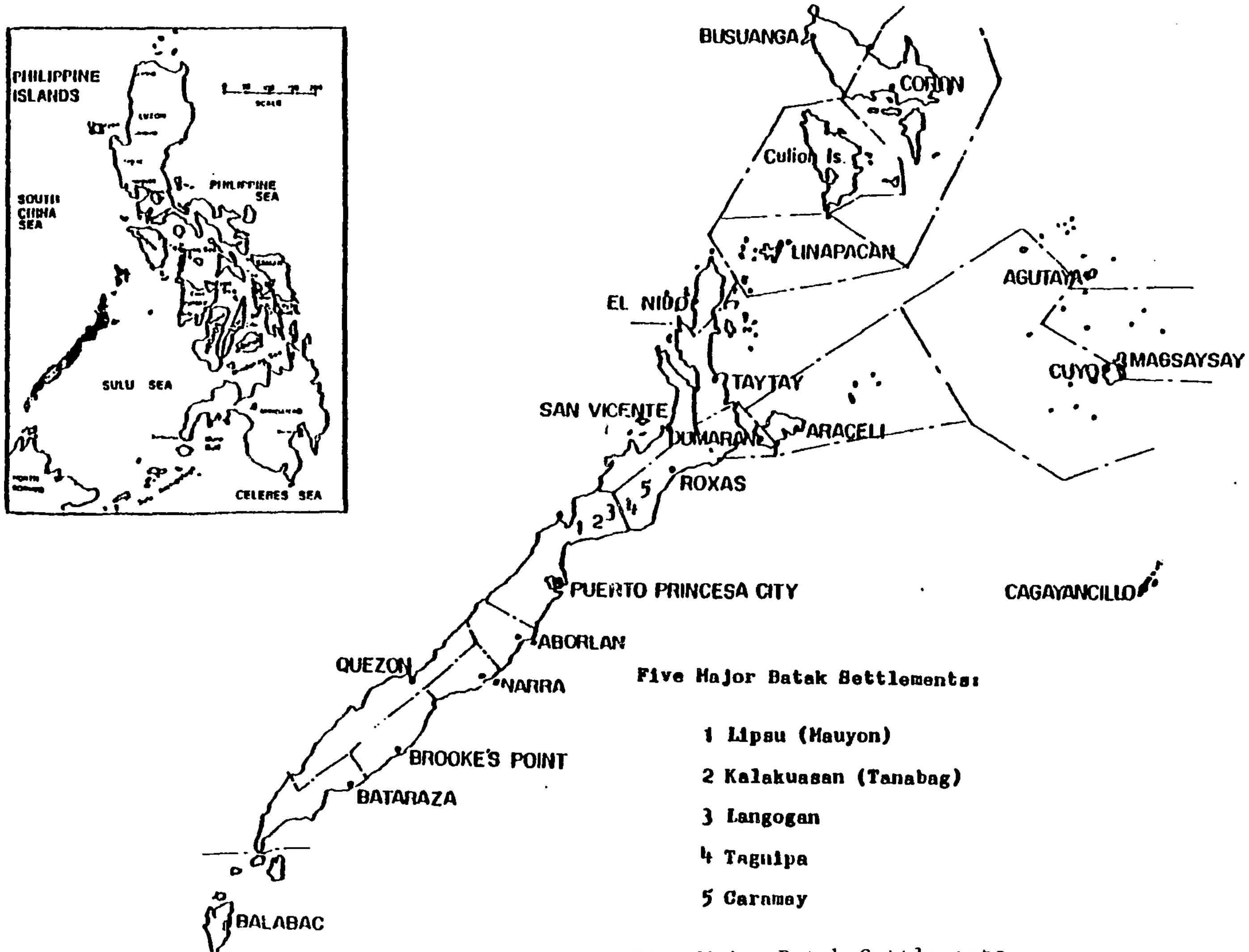
Demographic information for around 60 percent of the population was established using these three procedures. The rest (40 percent) were taken from direct reports made by the generally younger individuals in their late twenties and early thirties who already have learned the Western date and number system. They were able to give the complete date information (day, month, and year). Using the Myer's blended method to determine age heaping (Shryock et al. 1976:117-118), an index of 8 was obtained for the entire population. A higher index of

9 was obtained for the 35 and older and 7 for the younger ones. The three complementary techniques must have reduced age heaping tendencies of the older age groups.

In April and May, 1980, I censused the Batak. The original plan was to take a complete census of the five major Batak villages: Lipsu (Mauyon), Kalakuasan (Tanabag), Langogan, Tagnipa, and Caramay (see Map 1). But due to time constraint, the census was only taken for the first four villages. These are located far apart. A great deal of time is spent even if one takes the bus on the highway and walks up to each village. From these four villages, demographic information on 238 de facto Batak individuals was recorded.

The collection of demographic data did not actually end after May, 1980, but continued until the completion of the field work since cross-checking the data on age and previous births, deaths, and marriages had to be done. Also during the whole period of the field work, births and deaths were recorded.

Ethnographic Data: Intensive ethnographic data collection was confined to one village, Kalakuasan (Tanabag). This village was chosen for its accessibility and for its large population. Further, the Batak in this village participate more actively in cash transactions. Since increasing cash participation is associated with declining caloric returns (Eder 1978), more food stress was expected in this place than in others. The assumption that the Batak in this village experience a relatively more severe food stress compared to other villages was supported by anecdotal reports from the people.



Map 1. Map of the Province of Palawan Showing the Five Major Batak Settlements

Because of time and manpower constraints, it was impossible to obtain both intensive and extensive information on interhousehold food sharing. Thus the investigator opted for intensive information from limited household cases since longitudinal data on interhousehold food sharing would shed more light on the variability of this behavior as it relates to the seasonal conditions of food supply in the households.

The twenty-two Batak households in Kalakuasan were classified according to their family life-cycle stage defined on the basis of the labor contribution of the children. Family life-cycle follows the life path and role of the parents and children in the household economy. The cycle commences with the union of a young couple and continues with all the children having their own families while the couple's economic dependence on the married children increases. The couple's death marks the end of the cycle. The concept of family life-cycle stage enables one to see the effects of a number of demographic variables in the household as it develops from one stage to another. These variables are: household size, dependency ratio, and labor supply. Their effects will be manifested in the household as its food production capability and food needs change depicting various levels of food difficulty. Consequently interhousehold food sharing behavior has to be adjusted accordingly.

The ideal approach to our analysis would be to follow a household over time and monitor the changes in food production and the way food is managed in the household. In practice this approach is impossible to achieve since from the time a household is formed until it reaches the last stage whereby dissolution takes place by the death of its members, involves a great number of years. An alternative which approximates the ideal is to take a kind of chronological "snapshot" of households that represent every cycle-stage. We view each of these "shots" as the particular stage a single household has to undergo. In this way, we create a model that simulates a household in process. In my analysis I will therefore follow these household cases representing the complete cycle. In particular, my purpose is to consider the demographic changes in the household and examine how these bear on its food supply and sharing behavior.

Following my general criteria for the family life-cycle, four stages emerged with their respective types from the present Batak households:

CYCLE STAGE I	a newly wedded couple without children
CYCLE STAGE II	a couple with non-working-age children
Type 1	a couple with a newly-born child
Type 2	a couple with growing young children
CYCLE STAGE III	a couple with one or more working age children
Type 1	a couple with unmarried working-age children
Type 2	a couple with working-age children one or more of whom are married living outside
CYCLE STAGE IV	a couple with all children married
Type 1	a couple with own independent farm
Type 2	a couple without independent farm

Due to time, financial and personnel constraints, only one household was randomly chosen for each stage yielding seven sample cases. Since I opted for intensive information as mentioned earlier, the sample size was limited to a number I could manage to observe intensively.

The sample appears to be skewed, however. As we will see later in our analysis, six of the seven cases of households are dependent (receiving more food than they are giving) on the nonsample households in the population during the months of extreme food difficulty. This problem, however, does not affect my analytical framework and interpretation of the data. The skewness reflects important methodological issues both in formulating typologies for a very complex phenomenon and in drawing sample cases for a small population. Family life-cycle stage involves a complex array of demographic characteristics (such as age at marriage of couples and age of parents when their children get married, age distribution of children, and number of children among others) all of which may not necessarily be effectively subsumed in the definition used for each type. In this study, I was concerned with labor distribution of children to the household. The addition of working age children to the household labor and their departure from the household due to marriage were taken into account in the definition. Other demographic characteristics might likely be missed considering the complexity of the Batak family formation.

Two of the three households that were expected to be food givers, i.e., giving more food than receiving, during the period of food scarcity turned out to be food receivers instead. This anomaly is explained by the peculiar characteristics of these households. One household (C I) consisted of a very young couple (husband, 15 and wife, 14) who got married three months before my contact with them. Although they had their own hut, they stayed most of the time with the husband's parents and served as sitters for the younger siblings when parents foraged or worked at wage labor. They were provided with food and were treated as family members rather than as a separate household by virtue of their being married. Both husband and wife are carefree and are just happy to hang out in the households of relatives thereby neglecting their own swidden field. In 1980, their field was given the least care and naturally yielded a very bad harvest. Further, their caloric needs at this age are at their highest (FNRI 1980: 304), so is their food consumption.

In spite of another household's (C III-1) two additional laborers which enabled it ot have the highest household caloric production among the sample households, it, too, turned out to be a food receiver. Its two non-productive youngsters frequent their relatives' households for meals when their parents and productive siblings are out searching for food.

Furthermore, although a third household (C IV-1) did act as a food giver during the period of food scarcity, its level of performance was below what I expected theoretically. The excess of food given out over food received was rather low. This situation is explained by the fact that while the household gave out rice from their 1980 harvest[1] to the married children in the 1981 famine season, it also received food (from the sale of commercial forest products) from the latter. Later, it will be made clear that the sale from commercial forest products is used as an alternate source of food during famine season when swidden rice runs out. The husband of the couple in this household no longer engaged in

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[1]The couple engages more intensively in swidden agriculture. In the 1980 harvest the couple had one of the largest harvests from their swidden which was one of the biggest in the village.

the collection of commercial forest products due to his "back problem" caused by a bad fall when he was still young.

Apart from the peculiar demographic and non-demographic characteristics of the sample households, other factors may also explain the skewness of the sample. Since these seven household cases were randomly drawn from each group of households representing a life-cycle stage, it is possible that an extreme case in the cycle may have been picked out. This problem of drawing an extreme case might have been neutralized had the sample size been bigger than my actual number of cases or had a purposive sampling procedure been employed.

As a necessary precaution, if a similar study is done in the future, the choice of sample cases should take into consideration the following additional factors: (1) age of the couple, (2) length of marriage of couple, and (3) non-demographic factors such as physical defects that may keep one from a maximum labor utilization. For a small sample when the necessary logistical support is insufficient for a larger sample size, purposive sampling is advisable. However, such sampling should be done only when the researcher has an adequate picture of the interhousehold variation of the factors to be investigated.

The seven household cases were observed every other month for 12 months to document the cyclical fluctuation of food supply and the pattern of interhousehold food sharing. Each contact with a household lasted for one whole week during the entire waking period of its members. Thus 42 one-week observation contacts were accumulated for these seven households. While intensive observations and interviews were undertaken with these seven case households, the same activities were done for the non-sample households though less frequently (at least once a week). The data derived from these households were used to get a profile for the non-sample households.

I had my own hut in the village where I generally spent the night.[2] In cases where I had to travel to observe a household, I constructed a new lean-to close by or stayed overnight with the household, whichever was most convenient.

All food getting and sharing activities were recorded when the household was under observation. My assistant[3] and I took turns in going with the household members who collected food in different places. Most of the time one of us was left in the household to monitor all other activities. If the trip involved all members, we both went. During these trips the following information was recorded: time spent traveling to and from collecting sites, time spent for collecting, the kinds and quantity of food produced, consumed, and shared during the trip. Other household members, who could not be followed due to lack of manpower, were interviewed right after the trip. Since different persons were observed for each trip, all household members were eventually

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[2]This was constructed close to the house of my ceremonial brother (Sandugo). This relationship is established by the following blood-letting procedure: A slight incision on the chest of the two contracting parties is made. The blood from both is mixed with wine and placed in a cup from which each one takes a sip. This performance is accompanied by the medicine man's chanting. Establishing this kind of relationship further improved my relations with the people.

[3]Redempto Cervantes is Cuyunon-speaking and was then a new graduate from college (Palawan Teachers College) two months before I hired him. His language is spoken fluently by the Batak. This facilitated our initial interaction with them. Also, since most of the Batak can speak Tagalog, the national language of the Philippines, I did not have much problem communicating with them during this phase.

observed. Data collected from observation trips were used to corroborate their reported information.

Children visiting other households were observed in two test trips every week to monitor the volume of food eaten and the time spent during the visitation. This was also done for adults when they visited other households. These trips were made by either myself or my assistant when nobody from the household went out to collect. Weekly household averages were then computed from these data.

Using a 24-hour time allocation protocol,[4] time utilization practices were also recorded for all the seven households during every contact period. For household members leaving the house for field activities, the procedure discussed earlier was employed. This information provided the data on the intensity of use of various food production activities over time.

The 12-month period of observation made possible the determination of the bi-monthly changes in the food supply, consumption and sharing of the seven household cases. Every transaction made during the period of observation was recorded and the context noted. Each of the seven household cases was treated as the "EGO," and all the food that came into and went out from EGO was measured (see Figure 2).

A commercial spring weighing scale was used to weigh the food produced, shared and consumed. Since various food types have different proportions of edible parts, tests were made in the field to determine

[4] I applied the 24-hour time allocation collecting procedure used by Bion Griffin and Agnes Estioko-Griffin in their Agta research in the Cagayan Province, Philippines (Typescript).

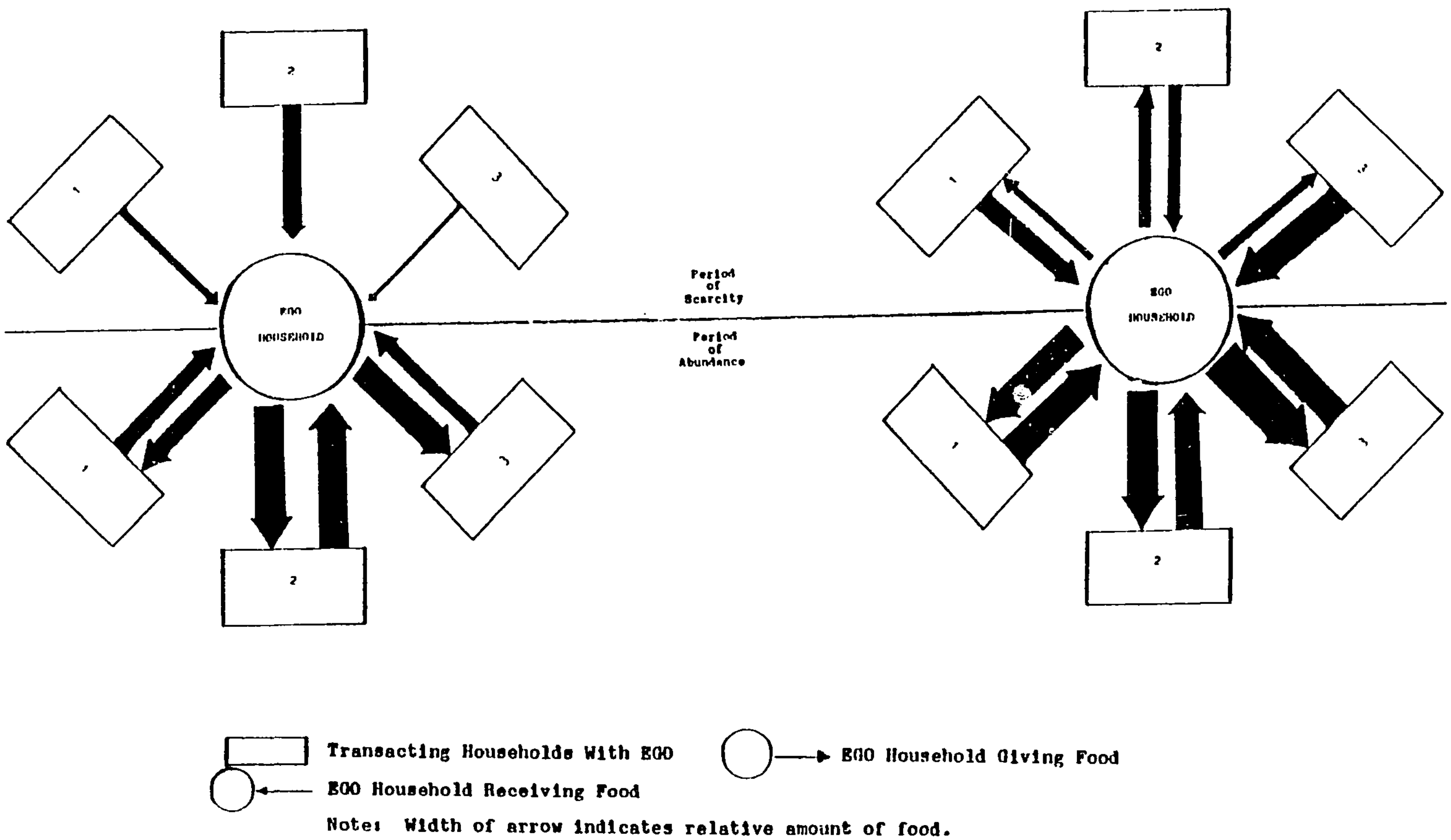

Figure 2. Schematic Diagram of Interhousehold Food Flow Analysis of Two EGO Households under Different Family Life-Cycle Stages During periods of Food Abundance and Scarcity

their "index of food utility" (IFU) value. This was established in the field by taking at least five tests for every food type and computed by deducting from its raw weight the weight of the non-edible portion and dividing the difference by the original raw weight. Using the Food Composition Tables: Recommended for Use in the Philippines (1980), the weight data of the various food types were converted into their caloric equivalence. To get the usable calories for every food type, the caloric equivalence was multiplied by its IFU value.

To maintain consistency of food production measurement, cash derived from the sale of commercial forest products and wage labor were converted into their rice cereal weight equivalence. This was computed at the rate of six pesos and 50 centavos (₱6.50)[5] per ganta (equivalent to 2.25 kilograms), the local price during the study. The rice cereal weight was then converted into its caloric value.

To measure food production, distirubtion (i.e., interhousehold food sharing), and consumption, three ways were considered: cash value, weight or volume, and calories.

In Western society, food is easily measured by its monetary equivalence. In a non-market society (such as that of the Batak) where food is rarely purchased, cash measurement is next to impossible. Cash reckoning for food derived from wage labor and commerical forest products may be easy and valid, but for food derived from wild root crops, wild vegetables, fish and wild meat, it is out of context.

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[5]At the current official ratio of ₱8.00 per $1.00 U.S., this is equal to $0.82 U.S.

This study deals with a population whose food supply seasonally fluctuates even to a level that may be close to starvation. Theoretically, it analyzes interhousehold food sharing not in the context of socioeconomic exchange per se but as a response the Batak employ in coping with cyclical food scarcity. This food problem which may affect their productive and reproductive capability has some nutritional implications. However, since this study is not a nutritional study per se, I will never attempt to evaluate the full range of the nutritional consumption of the population (NRC 1977b: 78). The use of calories for measuring food production, sharing and consumption appears most appropriate in the light of the intention of this work. Although weight or volume of food as a measure may be the most convenient, it is less meaningful since food of the same weight from different sources may not necessarily have similar caloric content. The Batak rely on various food sources.

Further, calories are more relevant than weight or volume as a measure for application purposes. This type of information is vital to nutritional programs (NRC 1977a: 107) for marginal agriculturalists. With the caloric data, policymakers and extension agents will immediately have access to relevant information (NRC 1977c: 44-46) especially when executing emergency food assistance programs (DeMaeyer 1976: 69-79).

In this study, calorie is therefore used, aside from its practical value, as a heuristic tool for assessing relative food production, exchange among households, and consumption. However, exchange is a complex phenomenon. It may involve items that can never be reduced into either their simple weight or caloric values. Caloric measurement is therefore applied only to food per se derived from various sources.

Swidden fields, tools, information, social responsibilities, social privileges, and other social aspects that may be involved in food exchange are treated according to their relevance to food exchange, not necessarily in caloric terms.

Different food types among the Batak do not have equal preference for sharing so their caloric values are distinguished according to the following sources: hunted, fished, gathered/collected, and purchased. In the analysis of the data, this classification is essential in controlling the effect of the emic perception of food for interhousehold sharing.

The study attempted to monitor completely all the food items produced, shared, and consumed. However, considering the complexity of these processes, it is possible that a few items were missed. Underestimation may occur as a result of failure to record and inadequate sampling, but the amount is not substantial. The caloric data should not therefore be considered as "absolute" but simply as one of the "indicators" of the Batak's level of production, sharing, and consumption.

CHAPTER III

SETTING: ENVIRONMENTAL SUBSYSTEM

The Province of Palawan

The province is located between 8°30' and 12°45' North latitude and 117°30' and 121°45' East longitude. It is around 363 nautical miles southwest of Manila, the capital city of the Philippines. Palawan lies between Mindoro and North Borneo, bounded by the South China Sea in the west and the Sulu Sea in the east (see Map 1).

The province, consisting of 1,768 islands and islets, has a total land area of 1,489,629 hectares comprising around 5 percent of the entire Philippine land area. Its biggest island is the province's mainland. It is a narrow strip of land 425 kilometers long, 40 kilometers at its widest (Brooke's Point) and 8.5 kilometers at its narrowest (Bahile, Puerto Princesa). Its mountain range, running along the mainland's length, divides it into the east and the west side. The east side is relatively more rugged with a very narrow coastal land.

Palawan's geographical isolation limits its economic potential in spite of its rich natural resources (also see Raintree 1978; Warner 1977; Fox 1954). Also, historical records reveal no economic promise for the province. James H. Blount who served as an officer of the U.S. volunteers in the Philippines from 1899 to 1901 and who subsequently became a U.S. district judge of the Philippines until 1905 reported that Paragua (the former name of the province) "is practically worthless being fit for nothing much except a penal colony, for which purpose it is in fact now used" (1913: 228). There was therefore not much interest in the province. Whenever Palawan was mentioned in Philippine history courses, it was essentially because of the penal (Iwahig) and the leper (Culion) colonies of the province. Palawan was therefore believed to be dreadful and hence the last place to be considered when people migrated to look for lands. In the early 1900s the vast land was still sparsely populated in spite of the mounting population in the provinces of Luzon and the Visayas. Mindanao, instead, was the common target of migrants. This situation was a blessing in disguise for the indigenous native population whose quality of life depended on the undisturbed forest land.

In 1956, the Philippine government established the National Rehabilitation and Resettlement Administration (NARRA)[1] which replaced former agencies having a similar function. One of its frontier area settlements was in Palawan. As incentives, the settlers were provided with housing materials and cash loans due at the time a settler was capable of repaying them (Fernandez 1972). For the first time, settlers from other provinces of the country came in large numbers. That settlement now stands as one of the municipalities of the province. The town's name is Narra, after the Program.

From then on, people were gradually encouraged to migrate to Palawan, but many were still reluctant due to the previous stigma. The horrible stories about malaria[2] also discouraged other people from migrating to the place. As a result, the province has one of the lowest population

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[1]For the evolution of this Office see Fernandez (1972: 176). Also see Raintree (1978: 20-21) and Huke (1963: 169) for the various resettlement programs established in the area.

[2]An endemic disease in the province. At present 25 percent of all malaria cases reported in the country come from Palawan.

densities in the country even up until today. It has only about 20 persons per square kilometer as compared to 2,019 persons in Rizal or 357 persons in Cebu, or 225 and 132 in Negros Occidental and Oriental respectively (NCSO 1978).

In the early 1970s, the discovery of the existence of oil in commercial quantity was announced and everybody's attention now turned to the province. For the first time in its entire history, Palawan is experiencing the highest annual population growth rate caused by migration.

The momentum for change, though not necessarily development, was established. The discovery of oil and the consequent inmigration of workers as well as the increasing number of tourists that visit the province as a result of the intensified advertisement by tourist industires especially in Japan and Europe (Palawan is said to be the last frontier in the country where "exotic" and still "pristine" culture can be found in the midst of industrial development), agitated further the relatively undisturbed life of the native population. To meet the tourists' needs, a five-star hotel is now operating amidst the multitude of small nipa and wild bamboo huts. Prices of important locally produced crafts and commodities have increased, forcing the local population to pay the prices that only tourists can well afford.

The province is now occupied by more than twenty ethnolinguistic groups coming from all parts of the country trying to share whatever land is available. Population pressure on land is now increasing. Land prices have gone up five or ten times higher than those of ten years ago.

Of the remaining forest lands in the province, more than one-half are now used in selective logging. The annual aggregate production in 1978-1980 was roughly 95,800 cubic meters of logs. This is, however, 64 percent lower than the aggregate annual production in 1977 (PDS 1979: 17). The decline has been attributed to stricter national logging laws (PDS 1979: 17).

The archipelagic nature of the province provides excellent fishing grounds enabling it to contribute 37 percent to the entire national commercial fishing output in 1973 (based on the report of the Bureau of Fisheries and Aquatic Resources). At present, the figures must be higher due to increasing deep sea fishing activity around the Palawan waters (PDS 1979).

In 1978 the Bureau of Mines reported the operation of nineteen mining companies extracting metallic and nonmetallic minerals. Oil exploration has been stepped up. In 1978, five oil wells in the El Nido oilfields were already producing around 40,000 barrels of oil per day.

Intensive irrigated agriculture is increasing as a result of the expansion of irrigation projects. In 1979 there were 339 irrigation systems operating.

Palawan is essentially agricultural. In 1975, around 79 percent reported farming, fishing, hunting, logging and other related work as their major gainful occupation. The rest are distributed under various categories such as craftsmen, professionals, salesworkers and other related workers (NCSO 1978).

The geographical location, as mentioned earlier, makes Palawan inaccessible from other provinces in the country. At present there is only one reliable route to and from other islands outside Luzon, the Manila route. A plane flies daily and a boat sails at least once every two weeks from Manila to Palawan and vice versa. Heretofore, the major contact of Palawan with the rest of the country has been only through Manila.

The Batak live in this socioeconomic environment. Their involvement, however, in the present socioeconomic structure of the province is indirect, through their contact and economic transactions with the lowland population. The Batak inhabit the village of Kalakuasan, a part of Barangay[3] Tanabag, 67 kilometers northeast of Puerto Princesa, the capital city of the province.

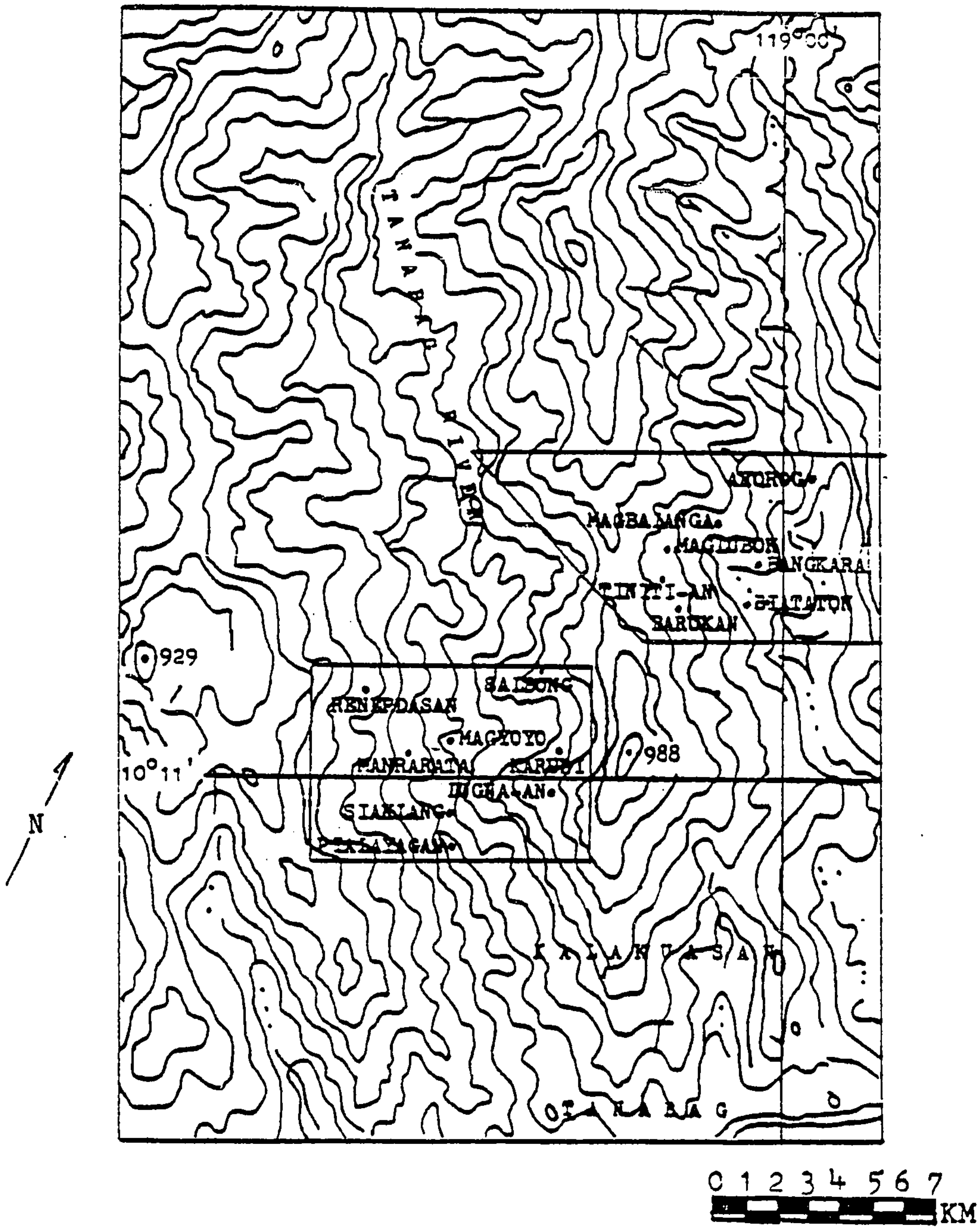
Kalakuasan: The Research Site

From the coastal barangay, Tanabag, one walks for around 30 to 60 minutes (depending on one's speed) towards the west slope of the mountain to reach the Batak Center (where the Batak assemble for meetings, get-togethers and other related activities). In 1970, Kalakuasan was declared by the city government of Puerto Princesa as the Batak's own territory (see Map 2). They were required to maintain the place and declare their ownership through land improvements by planting perennial crops such as coconuts, bananas and other fruit trees. Today, these trees are bearing fruit which add to their total caloric supply. A public school building (with one schoolteacher) was built for the Batak in 1975. After working for a year, the teacher gave

[3]"Barangay" is a sociopolitical term now used to replace the former "barrio." This is the second smaller unit to the town or municipality. Actually "barangay" is a pre-Spanish term used to represent a local sociopolitical unit, not a geographical one.

Plate I. Part of the Batak Village Center, Domesticated Crops in the Foreground.

Plate II. A completely Deforested Hillside--Result of Lowland Farmers Agricultural Activities.



Map 2. Contour Map of Research Site

1980 Batak Swidden Site

1981 Batak Swidden Site

Note: Contour interval: 100 meters with supplementary contours at 50 and 25-meter intervals (Source: Edition 2-AMS, NC 50-8, Series S501. Prepared by the Army Map Service (AMLD), Corps of Engineers, U.S. Army, Washington, D.C.).

up since he could not understand the children's mentality. Until now the school has never been reopened.

Kalakuasan now serves as their village center. It is the reference point when they speak about the directions as they move to the upper mountain areas to collect, hunt, fish or make swidden; or, when they move down to make use of the coastal food base. In Kalakuasan, they transform themselves from G-stringed to lowland attired natives when they go to the lowland market so they can interact with less social stigma with the "Filipinos"[4] there.

Topography and Soil: Where the Batak live is part of the mountain ranges which cut the biggest island of the province into east and west coasts. These ranges have an average elevation of approximately 1,100 meters (PDS 1976: 6). The Batak occupy the eastern side at around 250 meters elevation. When they hunt or collect they go up as high as four to eight times the elevation of their habitation or as low as the coastline when they do marine fishing.

A very narrow lowland divides the coastline and the Batak village. In this narrow lowland are farms (owned by the lowland peasant farmers) generally located along the river shores, the water of which empties into the seacoast of Barangay Tanabag.

Shrubs can be seen growing on fallowed fields (owned by lowland farmers) along the riverside as one follows the winding river to the Batak village. Cogon (*Imperata cylindrica*) and talahib (*Saccharum* sp.)

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[4]They consider themselves "only Batak" and not "Filipino."

grasses also grow together with the monocot and dicot shrubs and bushes. Very few dipterocarp trees are still in sight, a reminder of the once lush dipterocarp forest. Since the vegetation's root system is shallow, it is easily affected by the dry season. The change in vegetation color from green to brown as the season changes from wet (May to November) to dry (January to April) is very apparent indicating deforestation to a high degree in this area (see Plate II). As one approaches Kalakuasan, however, the vegetation is permanently green. Rainfall and seasonal changes do not significantly alter its vegetative cover.

The land is sharply dissected. Only around 5 percent is undulating, 65 percent hilly, and the rest mountainous.[5] The gradient runs between 30° to 60° inclination. The soil is well drained and is ferretic with good profile development and largely spodosols[6] of the mineral type. In most of the soil horizons, it is non-calcareous. Analysis of the soil samples taken from the Batak swidden fields showed a sandy-silt-clay texture. One-third of the soil composition, on the average, is sandy, the other third silty and the rest clayey, for all parts of the swidden fields. However, the hilltop tends to be more clayey since its sand and silt component is easily washed down causing the valley fields to be more sandy.[7]

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[5]The classification is based on the "Recommended Checklist for Environmental Description" (Weiner and Lourie, eds. 1965: 595).

[6]See Caguan (1981 MS) for this soil taxonomy.

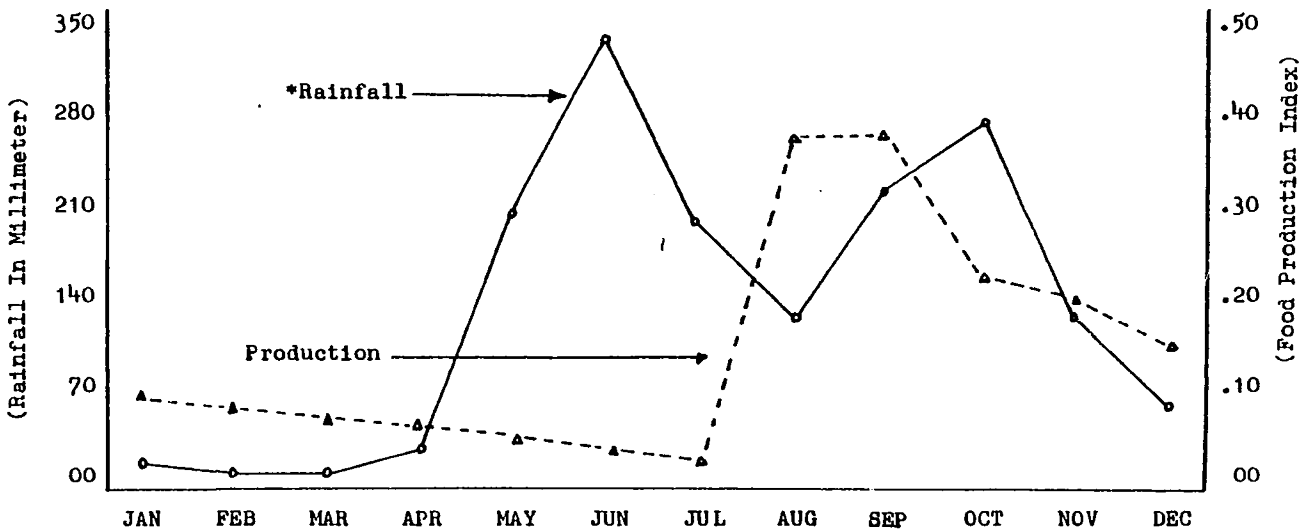
[7]Forty-one percent of the soil in the valley consists of sand in contrast to only 23 percent of that of the hilltop.

If we assume that swidden fields just cleared from unfarmed forest possess the best fertility conditions of the soil, then we can use these conditions as a gauge in determining the fertility of the soil in the other fields. Of the eight swidden fields cut from the unfarmed forest in 1981, four were randomly chosen as samples. From these fields, soil samples were taken and their characteristics and nutritional content were analyzed. The result serves as our standard to measure the soil fertility conditions of the present swidden fields cut from secondary forest fallowed at different lengths of time (ranging from seven to eighteen years).

Appendix Tables A-1, A-2, and A-3 (see Appendix A) indicate that in all locations; hilltop, slope, and valley, the Batak fields on the average, fare well by our standards. The fertility is naturally restored by the process of fallowing.

Climate and Rainfall: Two distinct seasons prevail in the area, dry and rainy. However, during the rainy months (May to November), two peaks of rainfall occur in the months of June and October. The first peak period (June) coincides with the "rice bloom" followed by the ripening of the grain and its harvesting (from August to September) when the rain begins to abate. Then once again, the rainfall reaches another peak in October and declines in November as the dry season approaches which ends in April (see Figure 3.). This rainfall pattern prevailed in the area during the last three years.

The rainy season actually lasts for seven months (May to November). December is an intermediate month between the two distinct seasons with a rain level slightly lower than the yearly mean. On the other hand, the



*Source: Pag-asa, 1981
Puerto Princesa
Palawan

Figure 3. Mean Monthly Rainfall for a Period of Three Years (1978-1980)

dry season lasts for only four months. Figure 3 indicates that it is during the dry months when food production is at its lowest; the highest being in the middle of the rainy season when rice is harvested. The period of caloric scarcity lasts for approximately six months.

Ecotypes and Food Zones: The Batak local environment consists roughly of five biotopes from which various food resources are tapped: the lowland coastal area including its marine shores, the rivers and creeks, swidden sites and the surrounding patches of unfarmed forest on the undulating and hilly terrain ranging from 200 to 1,000 meters above sea level, virgin forest beyond 1,000 meters above sea level, and the secondary growth forest from 200 to 1,000 meters above sea level (see Figure 3). The faunal and floral compositions in these ecotypes are relatively different which in turn demand different subsistence activities from the people. Two of these zones are basically created by the Batak. The secondary and other regrowth forest is the result of their swidden activity.[8]

In the coastal zones, soical and economic resources are available. While the Batak's contact and social ties with the lowland peasant farmers provide the former the opportunity to engage in wage labor for the latters' farms, rights to avail themselves of other resources, such as those from the sea, are free to the Batak. During summer, a group of Batak women occasionally comes down to fish using hook-and-line

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[8]Batak swiddening technique tries to preserve the forest (also see Cadelina 1982b), it does not intend to destroy it.

and to collect mollusks and crustaceans. The other resources available in the coastal zones are privately owned by the lowland peasant farmers hence the Batak can only utilize them through their social ties. These resources have technically become "social resources" (Endicott 1980). These include vegetables such as beans and squash of different varieties (available between August and December), fruits such as oranges, bananas, papayas, and mangoes (available from December to April), coconuts (all year round), rice, corn (July to August) and root crops (from December to April). As a result of the increasing participation of the Batak in monetized trade, the resources do not flow into the Batak households by reciprocity alone but largely by trade. The pricing system is always involved. In some cases cereal loans (with an exorbitant fixed rate of interest) are extended to a few selected Batak by the lowland peasant farmers on the basis of their special ties.

The stream-riverine zone provides them with their protein needs. Fish, mollusks, and crustaceans are available, while reptiles such as the sail-tailed lizards (Hydrosaurus sp.) are also common. On the basis of the forest canopy covering these rivers, they can be categorized into two types: sun-exposed rivers and shaded river systems. This differentiation is essential since most of their fishing activities are done in the latter. They claim that there are more fish in this area. Around 25 to 30 kilometers of this shaded stretch of the river is favorable for fishing by their own standards. But during my 1980-1981 fieldwork, they were only able to fish in a 5 to 10 kilometer stretch.

Some vegetables are grown in their swidden fields when the rice crop starts to bear grains. Beans, squash and eggplant may be raised

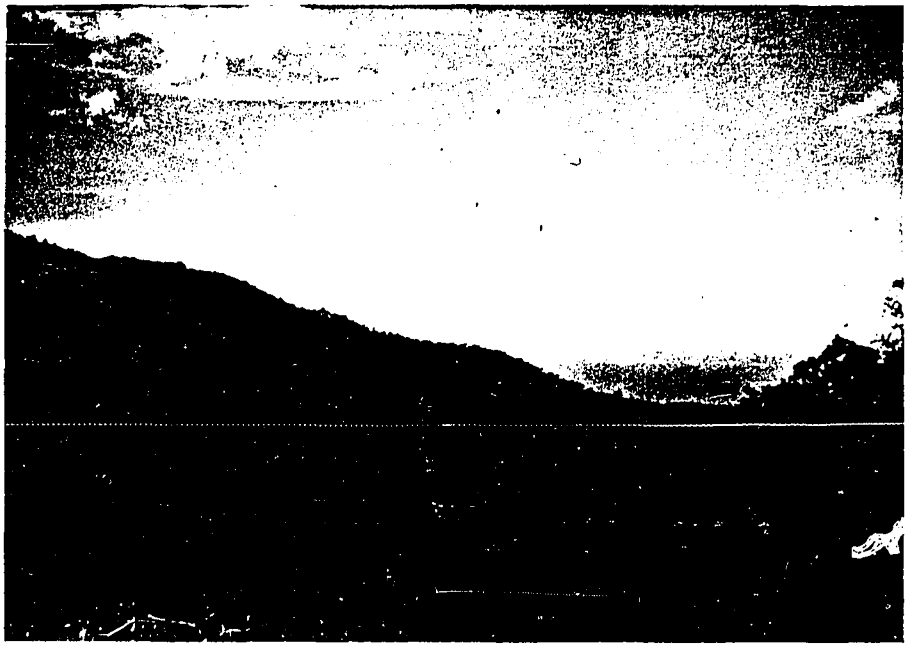

Plate III. Various Batak Food Zones.

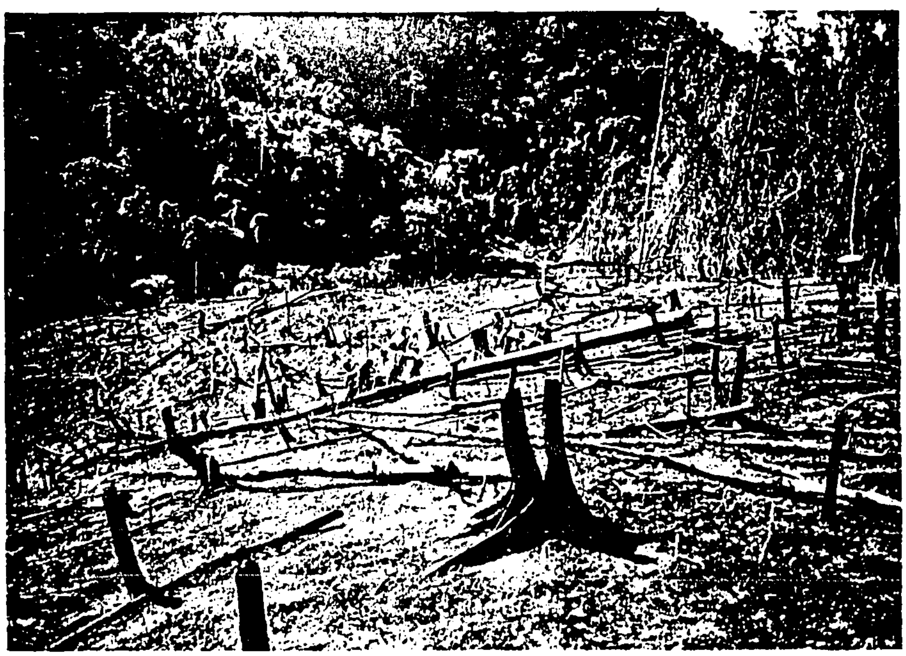

Plate IV. Newly Burned Swidden Field Planted to Rice.

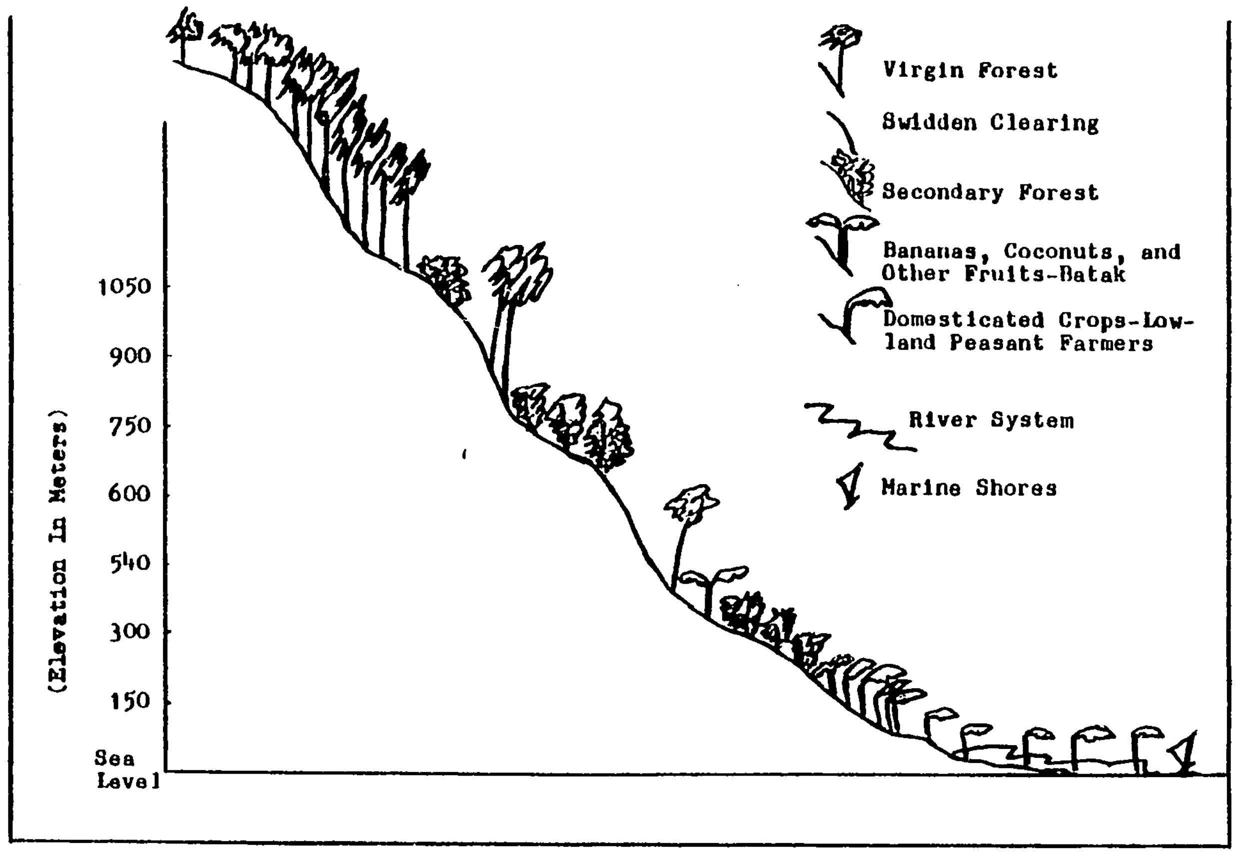

Figure 4. Elevation of Various Biotopes

and are harvestable in the months of November until March. Sweet potato and cassava may be grown after rice harvest while corn and millet are usually lined at the edge of the field while rice is growing. When the burned logs start to rot in the rainy season, they are filled with growing edible bracket fungi and are collected in the months of July and August. Around the swidden fields are patches of virgin forest which are never cleared since the land is rocky and steep. Here palm and rattan grow, the edible tips of which are broiled for salad or prepared as vegetable soup. Rattan in this area is generally preserved for domestic use. Flower-bearing trees provide nectar for honeybees, and honey is abundant during summer. Macaque, wild chicken, and wildcats are caught by traps in this area, especially during grain ripening season. Bago (Gnetum gnemone Linn.) trees, and some wild fruits such as wild mangoes (Mangifera philippinensis Mukh) and rambutan (Nephalium lappaceum Linn.) grow. Tender leaves of bago are prepared as vegetable soup and are available throughout the year. Wild mangoes are available in the months of October and November while rambutan is available in the months of August to September. Some trees whose fruits are eaten by wild pigs (generally known as simbulan by the Batak) also grow. When these fruits are ripe and start falling, wild pigs come to feed on them. They are caught by ambush using locally made muzzle-loaded rifles (paltik) in the months of July to October.

Around their swidden fields and pockets of virgin forests are patches of fallowed fields where secondary forests grow. Wild tubers, mushrooms, and wild vegetables are generally found here. One adaptive function of the secondary forest is that it produces these food resources that never

Plate V. Ripening Swidden Rice Field.

Plate VI. Newly Harvested Swidden Rice Field Cleared from Rice Stalks for Sweet Potato and Cassava.

grow in other zones, an effect of succession (Margalef 1968: 30-32; Brosius 1981; Rai 1982). Plant species are highly diverse ranging from shrubs and bushy type trees in most recently fallowed fields to hardwood ones largely below one to two feet in diameter in areas fallowed for several years. Flying squirrels, chicken-eating lizards (Varanus, sp.), armadillos (Manis javanica demarest), skunk, and Palawan peacock pheasants (Polyplectron emphanum) are common and are caught whenever opportunities allow. Sometimes wild pigs are caught in these areas too.

Beyond the 1,000-meter elevation is a wide virgin forest where commercial products such as wild resin, rattan, orchid, and honey are collected. It is a climax forest with a heavy top layer and extremely sparse underbush. It is largely composed of dipterocarp trees with diameters (at their largest bases) ranging between two to six feet and stand as high as 40 or more meters. Wild resin trees (Agathis philippinensis Linn) and wild fruit trees are abundant and game animals found in other biotopes are also found here along with the porcupine and the Palawan bear cat.

There are approximately 1,000 hectares of forest land in this village. Around 30 percent were selectively logged around ten years ago. Of the total area, around 60 percent are presently covered with secondary and the rest with primary (virgin) forest. Under the present Batak swiddening practices and the stricter laws against slash-and-burn practices, only around two hectares of primary forest on the average were cut annually by the Batak in this village for the last two years (1980-1981). After one year of cultivation, these fields are immediately abandoned to revegetate. In the 1980 planting season, only six out of the twenty-two swidden plots were cut from virgin forest while only eight out of twenty-four were cut in 1981. The rest were from secondary growth forest. Assuming that this rate is kept constant, it will take approximately another 100 years for the Batak to cut the primary forest completely. Under their present swidden system, there is no fear of forest disentegration if outside pressures are kept to the minimum.

While the caloric adequacy obtained from these resources depends on the population pressure, the intensity and the manner by which a household utilizes such resources largely hinge on the demographic structure and composition of a Batak household.

CHAPTER IV

DEMOGRAPHY: POPULATION SUBSYSTEM

Whether or not the Batak's present demographic structure developed as a response to a declining food supply is difficult to ascertain. Since the effects of the response can only be observed after a number of years, a diachronic monitoring of information is necessary before a more definite conclusion can be established. However, one thing seems certain: Their demographic structure can indicate how they stand in relation to their existing resources. The multiplicity of the Batak food zones demands adequate scheduling of their various subsistence activities, if the resources are to be utilized effectively. It is only when adequate labor in the household is available at all times that the multiple subsistence activities can be effectively synchronized.

The population as a subsystem, depending on its composition and structure, can either lessen or escalate the stressful food situation. One may raise this question, therefore: Is their demographic structure adapted to their present resources?

Population Composition and Structure

In the four villages censused, 238 de facto Batak individuals[1] were recorded. In Kalakuasan (the research site) alone, 81 individuals were

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[1]My definition of the Batak population is supposed to be restricted to the "full-blooded" individuals only. For various reasons, they have the tendency to identify with another ethnic group. A few "full-blooded" Batak may report themselves as Tagbanua because they think being one is culturally superior. On the other hand, a Tagbanua living in a Batak

living. If, as has been reported, there are approximately 1,000 hectares of forest land in the area, each individual therefore has about 12 hectares or slightly over one square kilometer for his use. This ratio is, however, much smaller than that commonly reported for many hunters and collectors (Birdsell 1958: 190; Steward 1955: 125; Lee 1965; Marshall 1976). It should be remembered, furthermore, that other ethnic groups like the sedentary Tagbanua, the Visayan and the Cuyunon lowland peasant farmers, are competing with the Batak in the use of these resources, especially the commercial forest products as well as game animals such as the wild pigs.

Of the total population, 47 percent are men, the rest are women. The average age is 30 years. Men (30.21) and women (30.79) do not differ in their mean age (see Appendix Table A-4). The age structure indicates a high percentage of the population in the labor force. Using the local definition of a working age individual,[2] every 100 working age persons (10-69) support around 17 dependents (0-9 and 70 and over). Low dependency ratio is economically advantageous for a population whose very survival depends on the utilization of perishable and non-perishable cyclical forest products. Their swidden agriculture, foraging activities, and their participation in the cash economy demand

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village may report himself as a Batak for fear of being ejected from the area. I encountered a number of problems of this kind and Eder during his 1980-81 field work had similar problems when he confessed: "As you can see, I had a lot of trouble with who is and who is not 'Batak'" (personal communication, 12 May 1982).

[2]A person becomes economically productive at the age of 10 and becomes non-productive again at approximately the age of 70.

personnel who are usually free from rearing dependents. The cyclical nature of work in their swidden fields requires ready manpower when demand for such work arises. During seasons of peak labor demand, pooled labor from several households provides the necessary manpower, not the stock of labor in each household.

On the average, a household consists of only four persons, a size very much smaller than that of their lowland peasant farmer counterpart in the Philippines or in other Southeast Asian countries.

The present population pyramid of the Batak (see Figure 5) suggests that the group's size may decline in the next twenty years. At present, there are fewer females (N=15; around 35 percent fewer) in the below 10 age cohorts than in the 10 to 19 (N=23) age category. Assuming that these fifteen women will all survive in the next fifteen years, the number that will enter into the childbearing age will still be fewer than that of the present 10-19 year olds. If there were to be no population pressure from the outside, no more than a dent on their own resources can be expected in the future.

Another striking feature of the Batak population is the small proportion of individuals in the five and younger age group. The difference between this age group (N=26) and the next group of five to nine year olds (N=27) suggests a substantial change in some vital characteristics in the last five years. Although this anomaly is mostly attributed to error in reporting, my data are consistent with those of Eder's as of 15 November 1980 for the "pure" Batak children. Eder wrote: "For 'full' or 'pure' Batak children--children whose parents are both 'Batak'--I show similar totals (with your total) for the entire

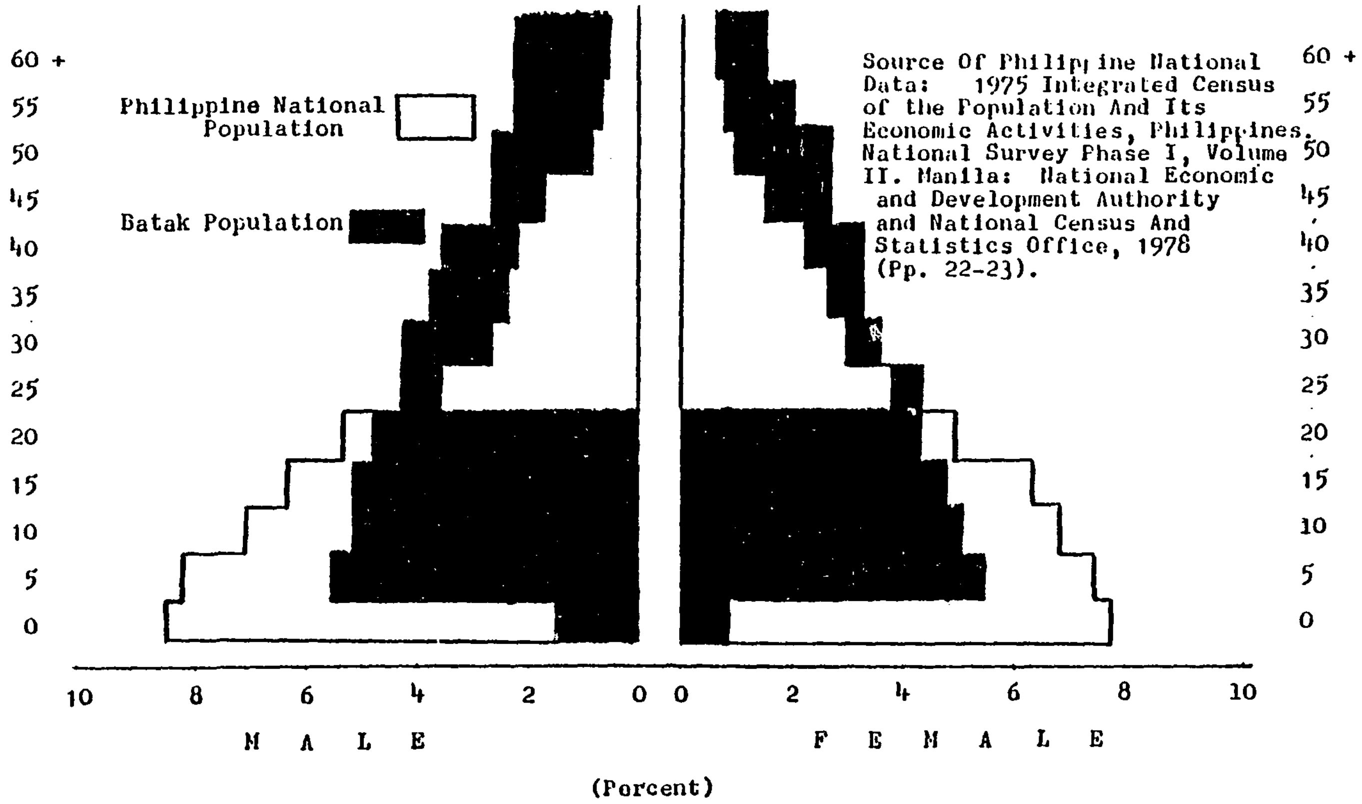

Figure 5. Batak (1980) and Philippine National Population (1975) Pyramid

population in the 0-4, 5-9, and 10-14 age cohort--very similar" (personal communication, 12 May 1982). What brings about this sudden decline[3] of the "pure" Batak population remains baffling. Given the nature of my data, only hypothetical explanations can be advanced. The latter part of this chapter will deal with this.

The present structure of the Batak population suggests a number of things that work to their own advantage in dealing with their resoruces: there is a propensity among the mothers to accept fertility control, low fertility, relatively long birth interval (much longer than that of the present lowland peasant mothers, see Appendix Table A-9), low dependency ratio, and relatively small family size (an average of four in contrast to seven among the lowland peasant Filipino farmers). These characteristics appear to be adaptive to both short- and long-term problems of food supply. With low food demand, a household can make do with minimum food supply. Wide birth spacing makes it possible for labor to be maximally utilized for food production to meet daily food needs. The consequent low fertility eases the pressure on their total resources.

In comparison, the Karen and the Lua of Northwestern Thailand who have adopted labor intensive agriculture after migrating to the lowland showed a much higher fertility level than the Batak (Kunstadter

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[3]Ethnographic evidence suggests that there was no epidemic that led to the substantial mortality of this age group during this time. Also, the mortality data indicate a relatively constant infant mortality rate during the last twenty years while only one incidence of foetal loss was reported during the last ten years.

1971: 57). These two tribes need adequate manpower for their labor intensive agriculture and are therefore motivated to produce more children. The Batak on the other hand, keep moving uphill to preserve their non-labor intensive pluralistic subsistence activity. With their limited marginal resources, a small population size is advantageous in the long term preservation of the forest ecosystem. Studies on ten different ethnic groups in Africa led Lorimer (1958: 119) to conclude that those sample groups living in the interior forest region tend to have lower fertility than those living in other areas. Unfortunately, Lorimer did not advance any specific cultural and ecological explanations for this phenomenon. Hayden, however, observes that

> . . . the most efficient subsistence economy occurs in groups of <u>minimum</u> size . . . . Because substantial energy is used in travel and transportation of food . . . , <u>large</u> aggregations of people are likely to rapidly exhaust food resources within the foraging range of campsites, thereby forcing the entire group to move frequently. The smaller the group, the less often it must move, and the less travel and transport work it must perform. (1981b: 360)

With the Batak's egalitarian social system, economic production is essentially intended to meet their basic needs rather than for social motives to generate social prestige as in a stratified social system in the Pacific (Brookfield 1975). Brookfield's data on the central highlands of New Guinea indicated intensification in the use of resources even before a high population pressure was reached. The Batak do not also have to grapple with some environmental hazards like frost which the mound builder Enga in the Mount Hagen range in the Western Highlands District of Australian New Guinea (Waddell 1972) have to face. This problem may lead to agricultural intensification.

For the Batak, there is no immediate need for such intensification unless population pressure, as a real threat, is apparent. With their present demographic characteristics, they can afford to preserve their forest ecosystem to maintain their generalized and extensive practices of food production. This suggests that whatever additional pressures on their resources may be forthcoming, they will not necessarily be of their own making but of the "outsiders" (see Estioko-Griffin and Griffin 1981a).

Demographic Processes

What accounts for the present demographic structure of the Batak? We will explore this question by analyzing the following demographic processes: nuptiality practices and the timing of menarche, natality, infant mortality, and intraterritorial mobility.

Nuptiality Practices and Timing of Menarche: Batak marriage is monogamous. Although Cole (who visited the Batak in 1907 and published his work in 1945) reported that they practiced polygyny and polyandry, the present Batak claim no experience whatsoever of polygamous marriage. However, levirate and sororate marriages are common, the former more frequent than the latter.

Child marriage has been reported, but is extremely rare. Normatively, physical contact between the couple is only allowed when the woman reaches her puberty.

On the average, a Batak woman first marries around age fifteen; a man at around twenty (see Appendix Table A-6). The first marriage usually takes place when a woman is just about to have her menarche (14.4 years old).[4] Among the forty and older age cohort of married women, the first marriage took place between the ages of sixteen and eighteen; and, between twelve and fourteen for the younger age groups, on the average. On the basis of the cohort data in Table A-6, however, it is quite difficult to draw conclusions about the changes in the nuptiality timing for two reasons. First, some in the younger age cohort (1960-1969 and 1950-1959 birth cohorts) are still unmarried unlike those in the older ones. For instance, 61 percent of the ten to nineteen age cohort of women (N=23) and 5 percent of the twenty to twenty-nine (N=20), are still unmarried (see Appendix Table A-7). Second, probably as a result of census error, it is quite possible that some of the ages reported by those in the older cohort (multiple marriage is experienced by many) may represent the ages of the women at the time of second or later marriages thus producing exaggeratedly high estimates for age at first marriage.

If we compare the Batak with other parallel population groups in the Philippines such as the Ata on Negros Island (Cadelina 1978); or the Agta in Northeastern Luzon (Headland, personal communication), age at

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[4] Data from seven women in Kalakuasan who already have completed their childbearing period indicated that their menopause took place between the ages of forty-five and fifty-five. However, Eder's data on the mean age of mothers at final birth is very much younger than my reported menopausal age. Eder theorizes that it is the early "shut down" of the childbearing age by the early onset of menopause that must have partly caused low fertility performance rather than "long birth spacing." This circumstantial evidence of "mean age of mothers at final birth" however is misleading since it does not necessarily demonstrate the onset of the menopausal age. The menopausal age difference in both our data may also be due to sampling error.

first marriage of the former is younger than that of the latter two groups. When compared with the contemporary Negrito population in Malaysia (Gomes 1978), the youth of the Batak is even more marked.

The normative expectation that husbands should be older than their wives makes men delay their marriage unlike women. Parental opposition to marriage between older women and younger men is strong and vocal. During my research work, one planned marriage (between a twenty-five-year-old man and a forty-five-year-old widow) was aborted due to strong social sanctions such as gossip and the group's plan to form a surugidin (a council of elders formed only when a crime is committed) to try the case. During the time of this study there was another case in which the couple eloped and hid in the forest until the woman became pregnant. It ended in public whipping and parental indifference to the couple.

Divorce[5] is common and to remarry is easier for women than for men. Aside from the cost a man has to shoulder in marriage, the relative scarcity of women in contrast to men makes it more difficult for him to do so. The high demand for women leads to fast recycling of widows and separated/divorced women into married life again.[6] In fact,

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[5]Reasons such as childlessness and adultery are not unusual; they are also common to other technologically similar population groups in Asia, Africa, Pacific, and South America.

[6]Frequent dissolution of marriage leads to frequent non-exposure to sex which eventually could reduce the overall number of births to women. The fast recycling of widows or divorcees back into the state of being married, shortens tremendously the period of non-exposure to sex as a result of marriage dissolution. Nevertheless, women who are married three times or more have two children (ever born) fewer than those married twice (see Appendix Table A-7). This is explained by the fact that dissolution of marriage is commonly caused by childlessness and adultery, which latter case is also commonly associated

this has led to the breaking of some taboos such as remarriage prohibition for widows for one year after the death of a husband, another deculturation process (see Eder 1977b). Seven cases have been reported to have undergone a counter-magic ceremony against the punishment for the breach of the taboo.

More women (13.4 percent) age ten and older have been married three or more times compared to men (7.4 percent) in the same age group (see Appendix Table A-6). The third marriage usually takes place when men and women are in their thirties. Similarly, more women (34.0 percent) have been married twice than men (25.9 percent). Second marriages start taking place when both men and women are in their twenties. The oldest age for a woman at her first marriage is between twenty and twenty-nine. This used to be the mean age of first marriage for a lowland Filipina in 1903 (P. Smith 1973: 8). This contrasts with the oldest age for a man which is between forty to forty-nine (see Appendix Table A-6).

Present practices show that third degree cousins marry. Marriage between persons closer than third degree cousin is considered incestous, hence tabooed. One case of first degree cousin marriage had to undergo a counter-magic ceremony to prevent the curse from the supernatural power (such as freak births or death of either of the couple or their

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with childlessness. Many anecdotal reports tell about love affairs between married men and women who do not have children in their respective families. These marriages ended in divorce and immediate remarriage of the lovers.

offspring). The couple's first baby died. Everybody attributed this misfortune to the breaking of the taboo, which was very bad indeed.

Natality: There is a variety of direct evidence that would indicate that the Batak are deliberately attempting to control fertility. First, husbands and wives are articulate in their understanding of the implications of childbearing on their food production activities and household food supply. Second, one often hears about their traditional techniques[7] to permanently sterilize women who do not want any more children. They do not, however, have any traditional technique that will temporarily sterilize mothers who still want children in the future. Third, there is a propensity for the Batak mothers to accept modern birth control. Before 1975, no Batak was reported to have ever used pills according to a family planning worker in Barrio San Rafael (close to my research site). From the following year until the present, eight women from my research site were reported to have accepted and used contraceptive pills.[8] This number is more than 50 percent of the women in the area with high pregnancy risk. The present pill users claim that they prefer this modern contraception over their traditional technique because it provides them with a freer option of having or not having a child. Their use of pills for the last five years could be one of the factors that must have caused the sudden decline in the number of births during the last five years (see number of 0-4 year-old

[7]Locally known as pangbaw-as. The medicine is made from roots and leaves of certain trees.

[8]Personal check on the pill users indicates that they are using pills regularly.

individuals in Figure 5).[9] The other causes may be the increasing malnutrition and perhaps delayed weaning of infants. These are non-intentional factors which will be discussed later.

On the average, a Batak woman gives birth four times by the time she has completed her childbearing period. The sum of the age-specific marital fertility rates for thirty married women[10] who have completed their childbearing period and who still are presently living with their husbands yields a total marital fertility rate (TMFR) of four[11] (see Figure 6). Marital fertility rate plummets at age thirty-five to a low level of 85 births per 1,000 married women and continues to drop to less than half that number by age forty until it reaches zero by age forty-five (see Figure 6).

A total marital fertility rate of four is definitely low. It is lower than the existing reported rate for population groups that have not deliberately controlled birth. Among the Ashanti tribes in Africa, an average completed fertility of six has been reported (Fortes 1958); seven for a Taiwanese rural population in 1952 (Tuan 1958); six for

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[9]Whether the prevalent use of contraceptive pills in my research village is true in other villages or not, I am not certain. Personal communication with Eder (12 May 1982) indicates that he is not certain either.

[10]The data from these women are used since their completed fertility histories are least suspect of error.

[11]TMFR should be higher than the total fertility rate (TFR) since the latter includes the unmarried female population in the age group considered as the divisor. The former only includes the married women. My figure is very close to Eder's most recent computation, 3.94, taken from a larger sample of women having completed fertility, as of 15 November 1980 (personal communication, 12 May 1982).

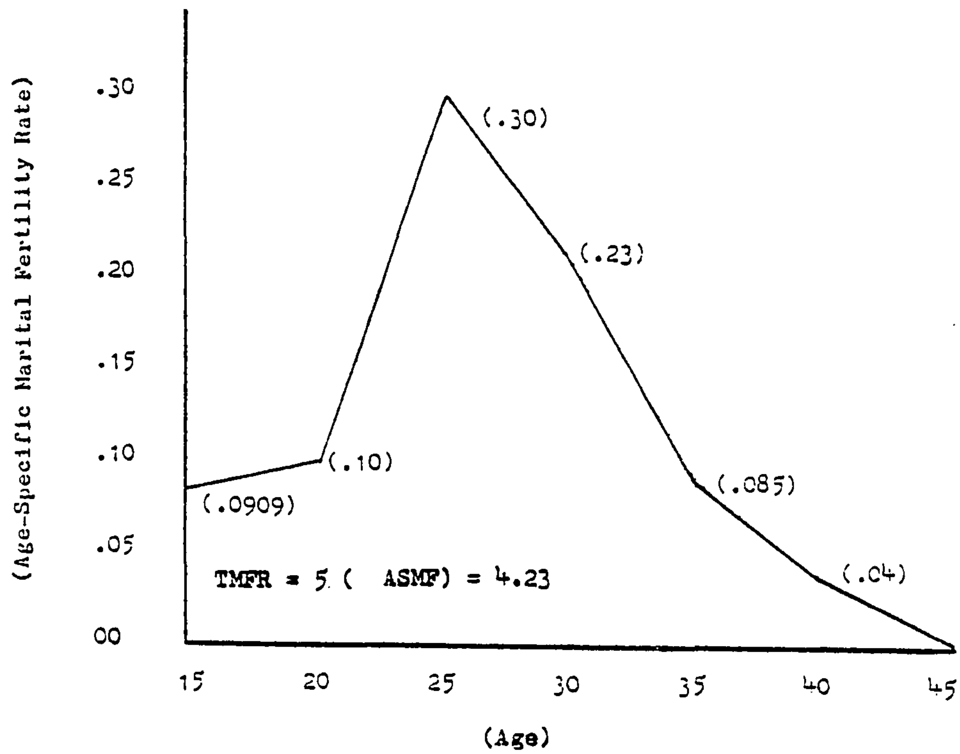
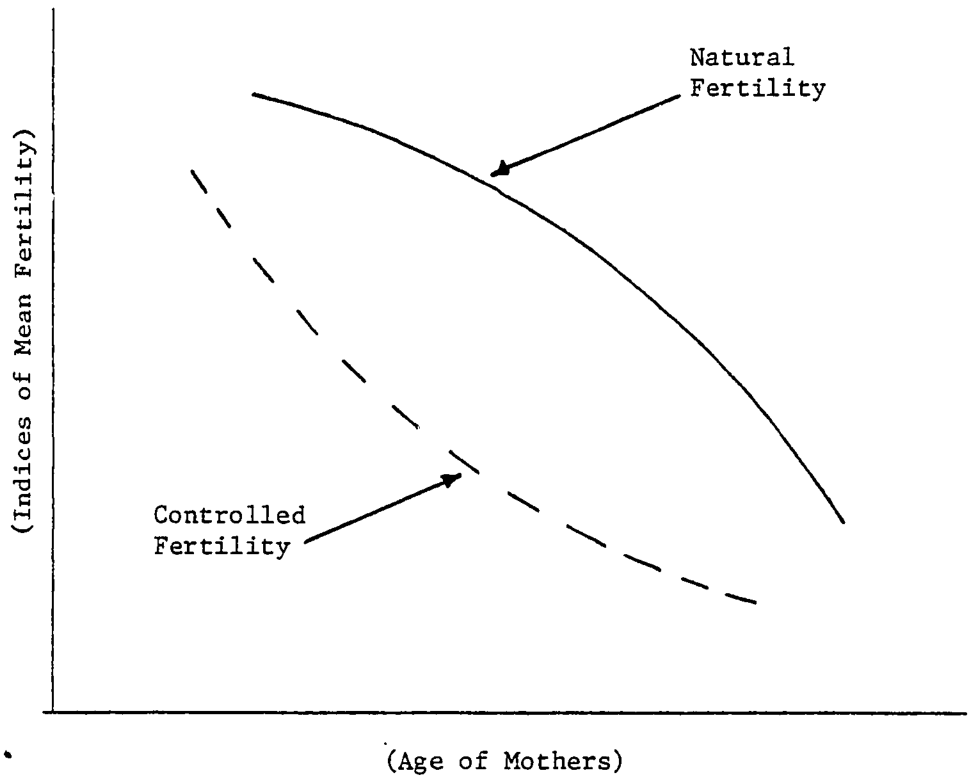


Figure 6. Age-specific Marital Fertility Rate (ASMFR) and Total Marital Fertility Rate (TMFR) Based on Completed Pregnancy History of 30 Married Women.

those in some Hindu villages in 1955 (Dandekar 1959); and an extreme high of ten for the Hutterites (Tietze 1957; Eaton and Mayer 1953).

But, is this low Batak fertility deliberately achieved through birth control or is it simply a natural result of living under a low fertility regime? Is there empirical evidence to show that the present fertility behavior reflects intentional control, so that fertility declines at a specific parity level when the desired number of children is produced? To answer this, we need to compare our Batak fertility behavior (assuming them to be controlling birth) to that of another population group which is not deliberately controlling birth. The latter is what we might call "natural fertility," to borrow Henry's (1961) concept, and the former "controlled fertility." In the "natural fertility" schedule, the age-specific fertility pattern reflects the age-specific fecundity level of the women which is assumed to be basically but not necessarily a pure biological phenomenon. As the woman progresses in age, the decline in fertility is believed to be the result of the natural progression of "secondary sterility" (L. Henry 1961: 83) which "arises after one or more children have been born" (see Multilingual Demographic Dictionary, p. 38, cited by Henry 1961: 83). On the other hand, in "controlled fertility," the age-specific fertility pattern is an expression of the number of births desired by the couple achieved by deliberately averting unwanted pregnancies using contraception. In this case the age-specific fertility is dependent on parity, unlike "natural fertility." Empirical evidence suggests that the relationship between the "natural" and the "controlled" fertility curves of mothers as they grow in age takes the following pattern, as shown in Figure 7 (also see



(see Knodell 1977: 222)

Figure 7. Schematic Diagram of the Relationship Between the Age-Specific Fertility Patterns of "Natural" and "Controlled" Population

Appendix B for detailed discussion of these concepts). Two things are apparent in the relationship between the two curves: (1) the "natural fertility" trend is convex while (2) that of the "controlled fertility" is concave (see Knodel 1977: 221).

Appendix Table A-8 shows that the Batak's fertility and the "natural fertility" almost form a unity while Figure 8 shows that both the "natural fertility" population and the Batak's curve take a convex shape, with the Batak's curve on a lower level. This indirect evidence suggests that the Batak still follow a "natural fertility" schedule. It is independent from parity, hence not deliberately controlled, but on a low level with a rate lower than the "natural fertility" population schedule.

But what keeps fertility down? This is a critical question which at this time does not have definite answers. The following speculations are offered for investigation in the future.

First, the Batak's traditional procedure of permanently sterilizing a woman might have shortened a woman's childbearing period or kept a childbearing-age woman totally non-productive. They reported that mothers who have difficulty in giving birth are usually sterilized to prevent possible maternal death due to childbirth. One medicine man whose wife died while giving birth to their youngest daughter claimed that after that incident he decided that his three daughters should bear no children. The youngest, whose birth caused the death of her own mother, has been married for five years to her second husband yet she is childless. The middle sister, married for seven years to her second husband, is also childless. The eldest almost died when she had her first child. After this incident her father sterilized her. She has been living with her present husband for almost ten years and remains childless. That these cases of childlessness are the result of the Batak sterilization procedure seems likely, but this cannot be substantiated at present.

Second, the prevalence of poor health as a result of increasing malnutrition (see Eder 1977b; 1978) could adversely affect the fecundity of childbearing women. Assuming that they are also facing a progressive

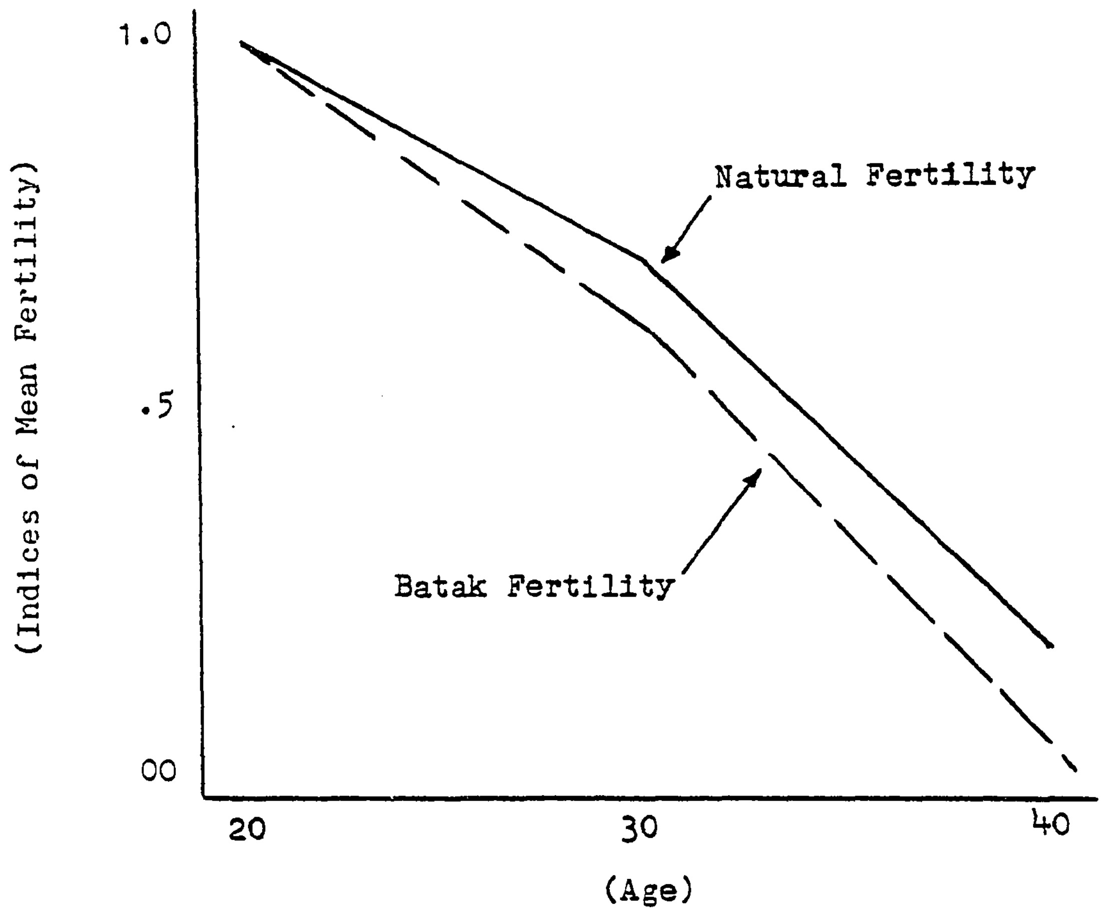


Figure 8. "Natural Fertility" and Batak Population Fertility Curve Compared.

decline of food aside from a cyclical caloric stress, their present food problem must be worse than in the past. If the "critical fatness hypothesis" (Frisch 1980; Frisch and McArthur 1974) regarding the minimum requirement for menarche onset (17 percent of body weight is fat) and for stable reproductive ability (22 percent of body weight is fat) of childbearing women is valid, then an extreme caloric decline could mean a corresponding decline in the bodily fat of women below the critical minimum requirement. When this happens, childbearing women become subfecund and pregnancy is non-volitionally averted. Howell's (1979: 189-211) data among the Dobe !Kung in Africa indicate that Frisch's hypothesis of "critical fatness" is applicable to this hunting and collecting population, although she feels that her data are not yet conclusive. Eder's preliminary analysis (personal communication, 19 April 1981) of anthropometric data he collected in 1980-1981 indicates that Batak women (of childbearing age) are thin and may be very close to "Frisch's 22 percent critical minimum fatness line." His data show a decline in their body weight during the months of food scarcity and his analysis on seasonal birth frequencies indicates a depression in the number of births about nine months after the "famine season." This indirectly suggests that women may be too thin to ovulate during the famine season or the men may just be too tired to make the sexual contact (Eder, personal communication 19 April 1982), having been exhausted by lack of food and by the extra effort expended in producing the scarce food. Also the demand for frequent foraging during the famine season may cause couples temporary separation reducing the frequency of coitus.

Empirical evidence on fertility performance of mothers after a famine period showed a significant decline in fertility. The Dutch famine from October, 1944 to May, 1945 was followed by a 50 percent decline of their birth rates (Stein, et al. 1975) and a similar magnitude of fertility decline was reported for the Bangladesh mothers after the 1974-1975 famine (see Bongaarts 1980). Report on the common occurrence of amenorrhea during famine is one evidence of impaired fecundity due to lack of food (Bongaarts 1980; Stein, et al. 1975; Keys, et al. 1950). Gonad atrophy is also reported during famine period (Keys, et al. 1950; Brazel 1978). Citing Smith, et al. (1975), Brazel reported that twenty-eight men, aged twenty-five to fifty-one, from Calcutta under severe protein-calorie malnutrition showed "clinical evidence of hypogonadism . . . including . . . diminished libido resulting in abstention from intercourse . . . . Total and free plasma testosterone were reduced, and rose to normal levels with refeeding" (1978: 45). This indicates that as the caloric stress progresses, more births will be averted in this manner. This could be another factor that may explain the sudden decline of births during the past five years (see Figure 5) when the Batak might have experienced their worst caloric stress. Although there are still some doubts concerning the exact connection between body fat and fecundity, evidence seems to suggest that an extreme "undernutrition may interfere with reproductive function" of women (see Ashmore 1980: 65).

Third, the practice of delayed weaning[12] could have unintentionally reduced the total fertility of mothers. Moreover, as caloric stress intensifies, it is possible that delayed weaning may be used as a way of saving food for the older children if breastfeeding constituted a substantial proportion of the child's nourishment. In this way, delayed weaning can be viewed as a part of the intrahousehold food allocation strategy. At present, breastfeeding continues until mothers get pregnant again. Whether the present Batak breastfeeding practices were as common as in the past cannot now be ascertained, however. Other population groups in the Philippines (see Table A-9 in Appendix A), with shorter breastfeeding times,[13] have a shorter birth interval than the Batak.

Fourth, foetal loss is another possible cause for low fertility. My observations, however, show that the rate of foetal loss is negligible; a high percentage of pregnancies reaching full term. When a woman is reported pregnant she is no longer expected to do much household work, reducing the risk of losing the baby. In fact during this time she seems to be more demanding and expects her husband always to be obliging. Of the total number of mothers surveyed, only three cases have reported one miscarriage each.

That the low fertility of the Batak is the result of their deliberate attempt to control birth is not consistently supported by my

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[12]For the effects of late weaning on fertility, see: Knodel 1977; Ng 1979: 156-159; Bonte and Balen 1969; Jain, et al. 1970; Kippley and Kippley 1975; Udesky 1950.

[13]It should also be noted that among these other groups, there is more prevalent use of modern contraception.

evidence. While my direct evidence suggests that it is, the indirect evidence refutes the hypothesis. This inconsistency may be reconciled by the following hypotheses.

First, the Batak do try to control their fertility by the use of their traditional technique, but this effort is not effective. Thus most of the factors responsible for the low fertility are nonvolitional resulting from inadequate food, poor health and sickness of childbearing women as well as their common practice of delayed weaning. Thus low fertility may largely be due to subfecundity.

Second, the Batak may be quite effective in their attempt at fertility control but its effect is not reflected by the age-specific fertility patterns of women. Since the Batak do not have the traditional technique that would still allow a woman to bear a child later when she so desires (they only have a permanent sterilization procedure), most of the women of childbearing age will never use it until they are finally sure they no longer want children. So their deliberate control effort takes the form of "terminating childbearing" altogether rather than "moderating" it until the desired number is reached which perhaps explains why the Batak have almost a zero age-specific fertility at age 40-49, unlike the "natural fertility" population (see Table A-8).

Third, the Batak might have been studied right at the time when food stress was most severe, and consequently when they started to respond systematically by controlling birth. Thus the availability of the contraceptive pills was heartily welcome after 1975. Since it will take years before their effects are reflected in their age-specific fertility pattern, they cannot be detected in the present study. Perhaps the anomaly we found among the 0-5 year old group shown in Figure 5 may be an indication of the effects of the systematic control just employed.

Fourth, the volitional and the non-volitional factors must have worked synergistically to produce the low fertility. But exactly how each factor works in a particular situation is not easy to determine. Paradoxically, this area is neglected in many population studies. The volitional and the non-volitional factors in fertility performance of mothers are largely studied as disparate components. Nardi (1981: 31) aptly observes: "Thus far, most studies have concentrated exclusively on one set of factors ('deterministic' or 'non-volitional') or the other ('self-regulating' or 'volitional'), without regard to their probable interaction."

Infant Mortality: More daughters than sons die before reaching age one. By using "panel technique," "social triangulation," and "relative age procedure" births and deaths of offspring to women were taken for a period of twenty years (from 1961 to 1980). This is shown in Appendix Table A-10.

The number of children born and surviving infants (0-51 weeks) gives an IMR of only 480 per 1,000 births between 1961 and 1980. In that same age group, more female (IMR of 552 per 1,000) than male (IMR of 494 per 1,000) deaths occurred. Respiratory, intestinal, and viral diseases (like measles) are the usual causes of death.

Beyond the infancy period, my death data are scanty and do not allow further treatment in this work.

Intraterritorial Mobility: At present, the Batak have stabilized themselves in their respective villages. Consequently, the village population is neither increased nor decreased by migration. The relative lack of potential wives due to the relative excess of men over women and the possibility of having marriageable men and women consanguineally related (a situation happening in my research site) did not significantly induce men to seek mates in other villages.[14] There is a common fear of economic difficulty among the marriageable men if they do find a wife in other villages. The uxorilocal rule of residence brings a potential husband to his wife's village resources, with which the former is unfamiliar (see Chapter V).

Geographical movement of the Batak is largely confined to their own territory and generally involves the collecting of commercial and subsistence forest products, hunting and fishing. The yearly shift of the swidden site (see Map 2) and the consequent shift of residential site as well as the coming and the disappearance of the dry season are other reasons for intraterritorial mobility. Movement during the collecting of commercial and subsistence forest products, hunting and fishing generally involves a few hours in one day or an overnight trip at most. This could be a solitary activity or may involve a group of individuals coming from different households, or a family in a household. Movement within a radius of less than a kilometer to at most seven is

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[14] Intermarriage between the Batak and those of other ethnic groups such as the Tagbanua (considered by the Batak themselves as culturally superior) generally takes the following pattern: a Batak woman to a Tagbanua man. A similar pattern was observed among the Negritos on Negors Island in the 1960s (see Cadelina 1974). My latest visit to the latter group in June, 1981, however, indicated that this pattern seemed

common. Longer distance trips are usual during the dry season when there are no growing rice crops which must be cared for. During the rainy season, a period of rice growing, movement is very limited, generally confined to the forest patches close to swidden sites.

Around three or four months after harvest when the dry season starts, families start moving down from their swidden sites to the lower elevations (generally along the river) to camp, a practice locally known as da-us. A number of families may converge in one side of the river or distribute themselves by single families along the river shore. This is the period when women intensify fishing activity. Men may join during this time but only in spear fishing or setting traps for crustaceans or hook-and-line for big fish such as fresh water eel.

At the coming of the rain and the beginning of the planting season, the da-us camps break up. The campers move to their respective swidden fields which are different from the last year's sites.

Intraterritorial movement largely involves resource utilization activities. Movement to a village nearby may involve marketing their commerical forest products, working for wage labor, or buying foodstuffs and other related items in the lowland market.

A more distant trip to another Batak village is largely a non-subsistence activity. From April, 1980, to May, 1981, only two couples went to another Batak village. This is only around 10 percent of the total number of couples in the village. One went to attend the funeral

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to have changed. The Negritos are presently undergoing a more severe technological change than the Batak.

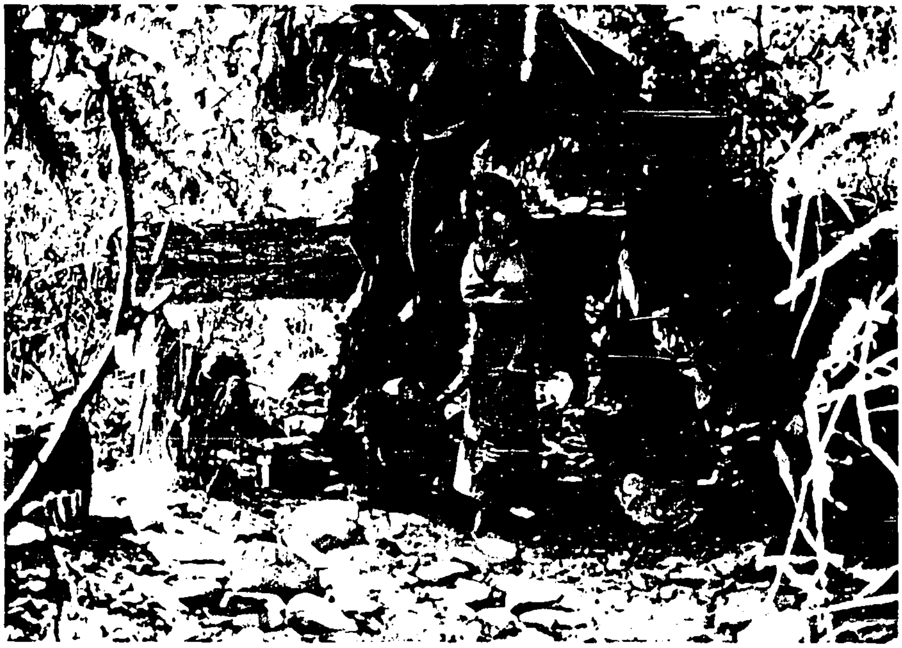

Plate VII. A Two-Couple Da-us Situated a Few Meters Away from River.

Plate VIII. A Three-Couple Da-us Along the River.

Plate IX. A One-Couple Da-us. Couple Taking Lunch with an Invited Friend on His Way Up-river.

Plate X. Cluster of Brand-New Huts after Summer Da-us Constructed Immediately Before Planting their Swidden Fields.

of his wife's brother. The other couple made a social visit after the harvest to the husband's sister in another village. The latter claimed that they can afford to visit at this time since they still have enough food supply.

The present movement of the Batak can hardly fit the notion of circulation or circular migration (Chapman, in press). The factors involved in circulation such as resource depletion in one area and resource availability in another do not apply to the Batak's movement. For instance the trip of a father from his house to the forest to collect is analogous to the manager's leaving his suburban house for his office in the city five miles away. Although the element of "oscillation" and "periodicity" may be involved, the factor of "resource depletion" and "resource availability" in the areas involved does not neatly represent the Batak case. One thing we should remember is that the Batak movement is largely confined to their own territory, while Chapman's case involves a number of territories.

Trends and Implications

In Eder's (1977a) analysis, he concludes that the present decline in the Batak's population, which he calls depopulation, is a negative result of the socioeconomic and ecological stresses they are facing today. It is an indication of their inability to cope with the problem of limited food. While I do not entirely disagree with his conclusion, I propose in this study an alternative way of looking at the present depopulation of the Batak. Instead of considering depopulation as a consequential <u>condition</u> resulting from their failure to adjust, I look at it as a positive <u>process</u> of coping with the increasing food difficulty given their present technological system and the conditions of their resources.

It now appears clear that the very low and perhaps declining fertility together with the high infant mortality produces their present demographic structure and enables the population to maintain a tolerable ratio between food supply and the number of consumers. Although malnutrition may affect fecundity of childbearing mothers, a number of circumstantial evidence in this study suggests that their low fertility performance may be also caused by volitional factors. By keeping their present demographic structure, they are controlling a probable population crash due to severe hunger in a large population. With their small population, present technological system, and their available resources, absolute starvation may be prevented thereby preserving its genetic pool. As long as the age-sex structure and size of the population do not go beyond the threshold point to sustain itself, increasing its size is no problem. Its inherent capacity to grow (intrinsic growth) when economic conditions improve (barring any unforeseen environmental risks and disaster) may make this increase possible.

I have indicated earlier the factors which keep the Batak population small. These factors might have worked together to produce the present composition and structure of the population. But how precisely each of them worked in keeping the population small is a question that cannot be resolved with certainty with the present data. This would be an important research problem to explore in the future.

Their small population size, low fertility rate, small household size, low dependency ratio, long birth interval, and propensity to accept modern birth control at present are characteristics that worked favorably in the management of their resources. The dramatic decline in the number of births in the last five or more years will definitely ease population pressure on their resources in the future. It appears at this point that it is the factors from the outside that will determine their future condition as a biological and a cultural group.

While their present demographic structure has seemingly helped them deal with their own food problems, their sociocultural subsystem may provide them with the necessary tool to survive under their present circumstance.

CHAPTER V

ETHNOGRAPHY: SOCIOCULTURAL SUBSYSTEM

Through a long process of selection, the sociocultural subsystem of the Batak evolved. Under this premise, their sociocultural subsystem can be viewed as an adaptive device for living at the people's disposal.

Past Ethnographies

The first ethnographic materials about the Batak[1] came out between 1900 and 1910 authored by Manuel Hugo Venturello.[2] His brief work which consists of a general description of the Batak location and their culture originally written in Spanish was published in 1907. He reported that the Batak "formed no rancherias and slept wherever night overtook them" (1907: 547). The accuracy of the portrayal of how the Batak lived during this time is something that one should take with caution. Be that as it may, we can be certain that around a hundred years ago the Batak led a kind of life different from the present. By 1900, the Batak started to cultivate swidden plots and "furnished scarcely enough food during the first days of harvest" (Venturello 1907: 547). The report seems to indicate that their clearings were then relatively smaller than those of today if we take into account their present yield which takes

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[1]The Batak are generally regarded as belonging to the Negrito population but existing literature indicate disparate views. In 1917, Beyer described the Batak as a Papuan type while Estel in 1952 reported them as Veddoid. E. Miller in 1904 regarded them as Negritos. This issue, however, lies outside the scope of my present study.

[2]Of Spanish descent, he used to serve as President of Puerto Princesa (Landor 1904), the present capital city of Palawan.

them a little farther. Similar impressions can be gathered from E. Miller's (1904) report. Their economic network started to expand when they established contacts with the lowland peasants and the semi-sedentary Tagbanua (Venturello 1907: 547). Barter trading started. Venturello's data seemed to suggest that the things coming into the Batak community were essentially tools. Presumably, clothing was not then one of the commodities bartered. He saw men and women wearing only bark cloth while mothers carried their babies on a piece of bark cloth too (Venturello 1907: 547).

Utilizing much of Venturello's materials, Landor published his book, Gems of the East, in 1904 which described very briefly the physical, social, and technological aspects of the Batak way of life. In the same year (1904), Palawan's American military governor, E. Miller, wrote a similar treatise on the Batak. These materials got circulated and obviously came into the hands of anthropologist Fay Cooper Cole. In 1907 Cole visited the Batak very briefly (Warren 1964: 21). Needless to say, such a short contact with the people did not enable him to produce more than a brief and general description of their culture, like the other early materials. Cole's work did not come out until thirty-eight years later in his book, The Peoples of Malaysia (1945). Other general and brief ethnographies of the Batak can be found in the presently known Beyer-Holleman Papers (n.d.) included in the Beyer Collection of Philippine ethnography. It is obvious that this material utilized the earlier information published.

The first organized and more systematic ethnographic investigation of the Batak started in 1951 when Charles P. Warren did his field work from July, 1950 to May, 1951. His major concern was on why the Batak changed their lifestyle. In the 1920s the Batak began to participate more extensively in the monetized trade (Warren 1964; Eder and Pagayona 1971) when the demand for commercial forest products from Manila increased. Swidden fields were enlarged and now served as the base of their daily economic activities. Commercial products, besides tools, were introduced. His work, The Batak of Palawan: A Culture in Transition concluded:

> These major changes in the subsistence patterns are directly related to a concomitant reduction in the geographic mobility of two principal units of the social structure--the family and the band--and have influenced the composition of these units as well . . . . Why have the Batak changed in the direction indicated by the data? . . . . The first positive factor leading to change is an ecological and demogrpahic problem . . . . Since the land available to the Batak for hunting and collecting activities have been gradually reduced through time for various reasons, . . . , then the ecological balance between food supply and demand has been upset and disturbed to such a degree that the Batak have been pressured into supplementing their food supply by means of . . . alternatives . . . . (1964: 118-120)

Warren's conclusions strongly reflect an ecologically oriented approach. Unfortunately, he did not follow this up with a finer ecological analysis. Instead, he published linguistic materials on the Batak vocabulary (Warren 1959; 1975b; 1975c). This material was further enriched by a more comprehensive Batak-English Dictionary with more than 4,000 entries put out by the Summer Institute of Linguistics of the Philippines compiled by Audrey Mayer and Rosemary Rodda (MS, n.d.).

In the latter part of the 1960s James Eder went to Palawan as a Peace Corps Volunteer. During his stay in the province, he collected demographic data on the Batak using a social-anthropological census technique. This work was published in the Philippine Sociological Review in 1971. Since then Eder has revisited the Batak three times: in 1972, 1975, and 1981-1982. His major interest is ecological focusing on the sociocultural implications of the Batak depopulation and the factors responsible for it. The thrust of Eder's research can be gleaned from the introductory section of one of his works:

> This paper is part of a larger and ongoing effort to study the impact of modernization and change on Batak society . . . I have begun to examine the kinds of stress . . . that have accompanied restructuring of traditional Batak ecological and social relationships . . . . Later study will focus on possible mechanisms relating these stresses to unfavorable changes in fertility and mortality rates, and hence, to population decline. (1977b: 12)

To date, Eder's (1977a; 1977b; 1978) three published works are directed at this issue.

In 1975 a section on the Batak was included in Ethnic Groups of Insular Southeast Asia (Volume 2: Philippine and Formosa, edited by Frank M. Lebar). Warren (1975a) wrote this section utilizing most of the data from his 1950-51 field work. There is nothing new in it since it is merely a recapitulation of what he and others had reported earlier. It generally is concerned with the Batak's lifestyle including settlement pattern and housing, economy, kin groups, marriage and family, sociopolitical organization, and religion. Due to the age of the data, some no longer reflect the present situation of the Batak.

During the past few years, the Research Center of Palawan Teachers College, Philippines has compiled some ethnographic field notes which still need analysis, organization, and publication.

Present Ethnography

Today, the Batak are considered marginal agriculturalists who must have emerged from a pure hunting, fishing and collecting nomadic group about 100 years ago. Food is presently derived from swidden agriculture, hunting, fishing, collecting commercial and subsistence forest products, and wage labor. Now, swidden agriculture has become the focal point of their subsistence activities. Hunting, fishing, collecting, and wage labor are synchronized with the phases of work in their swidden fields. To preserve soil fertility, swidden plots are left fallow for seven to eighteen years after one year of cultivation, a length of time found sufficient to naturally restore soil fertility (Sabhasri 1978; Kunstadter and Chapman 1978; Zinke, et al. 1978).

The increasing demand for commercial forest products (rattan, honey, Manila copal, and orchids) from the provincial capital city of Palawan (about 70 kilometers distant) and from the national capital of the Philippines (some 360 nautical miles away) widens their monetized economic base. With cash derived from the sale of forest products, they buy foods such as cereal, fish, and canned goods as well as non-food (clothing, radio and other related items) produced outside the Batak community. They have now more varied economic activities (Eder 1978). They are no longer self-contained. Interdependence between the Batak, and other neighboring ethnic groups, and the total national population is increasing. They work as wage laborers in the lowland peasant farmers' fields and depend for more cash on the bigger national economic system. They are now undergoing an ecological transition (Bennet 1976: 139) from being an ecosystem to a biosphere people (Dasman 1976: 283).

The former

> . . . depend entirely upon a local ecosystem, or a few closely related ecosystems. Virtually all of the foods they eat, or the materials they use, come from that ecosystem--although there will be some limited trade with other ecosystem groups. Because of their total dependence on a local system, developed usually over many generations, they live in balance with it. (Dasman 1976: 283)

On the other hand, the biosphere people

> . . . draw on the resources of many ecosystems, or the entire biosphere, through networks of trade and communication. Their dependence on any one ecosystem is partial, since they can rely on others if any one fails. Drawing as they do on planetary resources they bring great amounts of energy and materials to bear on any one ecosystem--they can devastate it, degrade it, totally destroy it and then move on. All of those who are now tied in to the global network of technological society are biosphere people. (Dashman 1976: 283)

The "ecosystem people" are usually in "equilibrium" with the environment, while the "biosphere" groups are in "disequilibrium" (Bennet 1976: 139).

The forested area where the Batak used to hunt and collect is now greatly reduced. The area between the lowland coastal zone and the present Batak territory is reported by Batak who are fifty years old or older to have been completely covered with forest even twenty years ago. This is completely deforested by logging activities followed by the lowland peasants' farming activities. Cash crops like coconuts, coffee, bananas and other fruit trees, corn and rice are planted. There is no doubt that this has created an ecological stress on the Batak food resource base consequently diminishing their food supply. Some empirical evidence indicates that their food production efficiency has tremendously declined. Eder's findings indicate

> . . . that, to the degree that the Batak choose today to earn [rice] calories by collecting and selling Manila copal in lieu of earning calories by digging the wild yam . . . , they suffer an approximately 40% decline in the productive efficiency of their labor. Thus, today they have to work harder, as it were, to earn their subsistence, even as they must work harder anyway to satisfy many recently-acquired non-subsistence wants in the marketplace. (1977a: 18)

The Batak themselves corroborated this by claiming that today they experience more hunger than before. Eder in 1977a, b and 1978 reported that the Batak "complain frequently of hunger and claim that, as a people, they are today chronically undernourished." This gross caloric inadequacy is worsened by the cyclical food scarcity.

Under these conditions, the Batak have to relate themselves creatively to the whole system. Four areas of their sociocultural sub-system will be discussed: family, household structure and kinship pattern; social mechanisms; belief and ideological orientation; and technological practices.

Family, Household Structure and Kinship Pattern: Ideally, a Batak couple should come from the same place of upbringing, not necessarily birth, an expectation which has economic and ecological overtones. Couples explain that to establish a family in a new place is difficult since one is not familiar with the forest and rivers to collect, hunt, and fish. Also, more social linkages and ties are established in the place where one grows up. Ninety-two percent of the husbands and 73 percent of the wives surveyed prefer to get their mates from their own community where they grew up. The pattern obviously does not fit into the patrilineal band model described by Steward (1955: 122-142) for various hunting and collecting populations around the world. The composite band practiced by the Semang in the Malay Peninsula and the Negritos of the Philippines in general (Steward 1955: 129-131), however, is very close to the Batak practices. Patterns of resource exploitation as one of the explanations for these practices (Steward 1955: 123) is consistent with our Batak data.

Normatively, residence is uxorilocal, a rule which has presently created some fears of more economic difficulty for men who cannot find their wives right in their own village. Among households I intensively observed one husband was complaining about the debt he incurred during his first two years of marriage. His unfamiliarity with the forest resources in his present residence (wife's village) forced him to live on loans from a lowland peasant for his cereal supply. He will have to pay up for the next two years.

A couple, however, is not necessarily a prerequisite to forming a household. Eight percent of the households surveyed consisted of unmarried persons. These either consist of bachelors (related) or widowers who have not yet remarried.

The households change their structure at least twice a year (see Figure 9). These changes are brought about either by brief or extended interhousehold visitations. Such visitation may be made by married daughters (with their own children) whose husbands are away to hunt or collect forest products; or by other unmarried relatives. Extended visitation takes place when members of other households come to help make kaingin, or plant or harvest rice which may last for weeks.

Figure 9 suggests that the sample households tend to be nuclear most of the time during their mid-family life-cycle stages while during

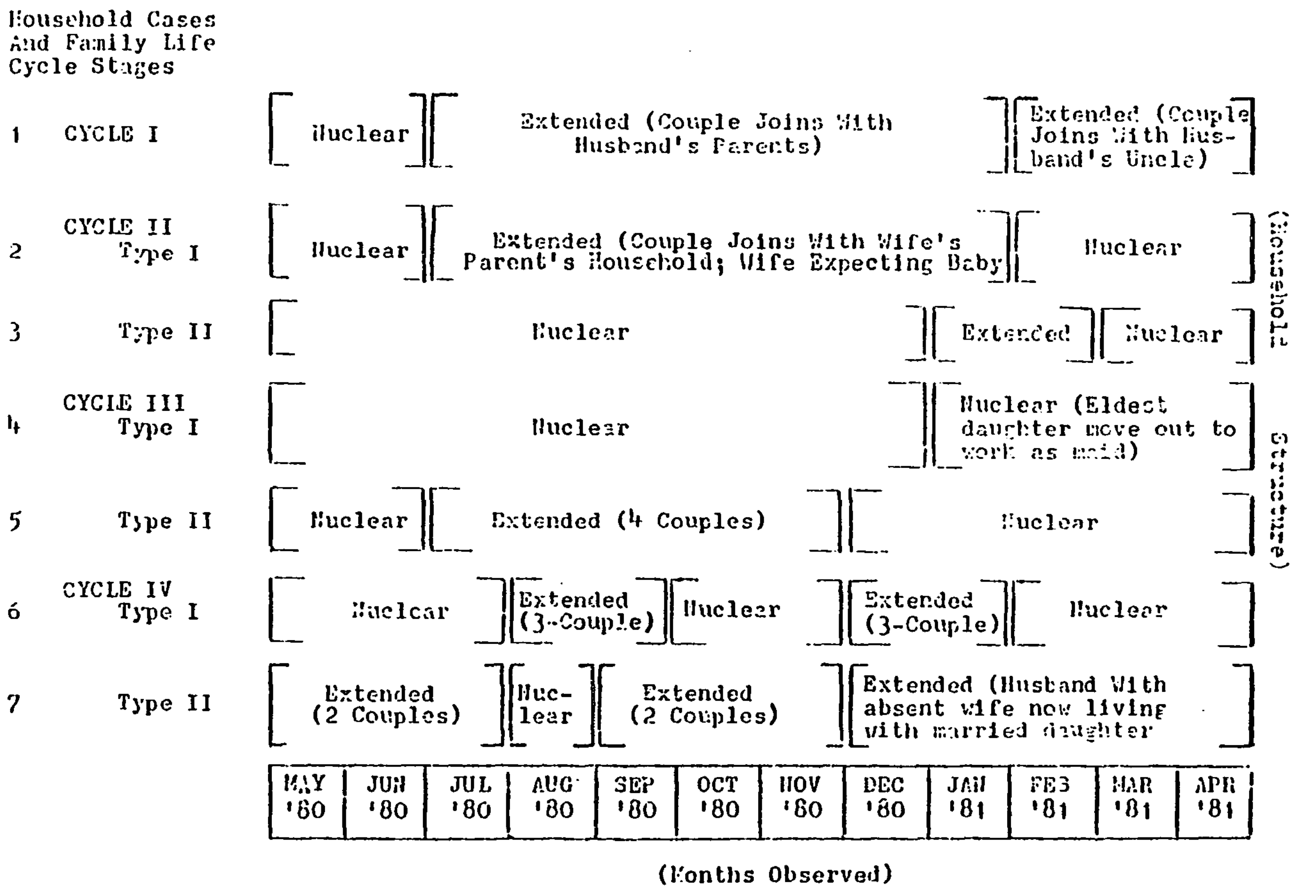

Figure 9. Household Cases and their Family Life Cycle Stages and Timing of Household Structural Change in One Agricultural Year (1980-1981)

the first and the last cycle stages they tend to be extended most of the time. Also, it is during the first and the later stages when household structure changes more frequently. Households with a minimum labor supply (C IV-2) merge with other households (of married children) when food in the community is at its lowest. They split again forming a nuclear household when the small swidden plot (provided by married children) is ready for harvest.

The change in the household structure generally coincides with the schedule of labor demand in the fields. By having two or more households fuse, labor is pooled during periods of peak labor demands.

The family life-cycle stage of households also affects the frequency and timing of changes in household structure (see Figure 9). Later we shall see that this also affects the level of food production and consumption in the household as well as its food sharing behavior.

Their kinship system is bilateral.[3] Marriage between relatives closer than third degree cousins is considered incestuous. Such an incestous marriage is tabooed but it has occurred in the present generation, as we saw earlier.

Kinship is established either by affinity, consanguinity or ceremony.[4] There seems to be no distinction in the way one relates oneself to any of these kin types. One's responsibilities to, and privileges from each other are essentially similar. There is, however,

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[3]For a more detailed treatment on this and on kinship terminologies, see Warren (1964: 83-86).

[4]A kin tie formed by this ceremony is locally known as sandugo. I established such a kin tie with one Batak while in the field.

a form of "in-law avoidance." One is never allowed to mention the name of one's in-laws regardless of the latter's age.

Households in the village can be categorized into different levels according to membership in socioeconomic units (such as hut cluster and labor pooling group) and the intensity of interhousehold food sharing as well. Each level is represented by the concentric circle in the popular "ripple effect." It starts with the innermost ring, with the nuclear family as the EGO, and ripples out to include specific kin types to the outermost one that includes the "generalized other" households (see Figure 10). The closeness of a particular level to the nuclear family of the EGO household predicts the preference for membership in a hut cluster and in labor pooling groups as well as in the intensity of inter-household food sharing. This closeness means the likelihood of hut clustering, more frequent labor pooling, and greater intensification of interhousehold food sharing behavior. There is one limiting factor, however, on the kinship level as a determinant with regard to preference for a particular individual; geographical distance. There seems to be a "distance threshold" point beyond which kinship level no longer predicts this tendency.

Social Mechanisms: The Batak society is egalitarian. There is no particular social segment of the population that controls or monopolizes any of their resources. Each one has equal access to various food zones. Although food products derived from their resources theoretically become private property of the producer, there are a number of mechanisms in the sociocultural subsystem that allocate or distribute these food products to other households. Four such mechanisms are identifiable:

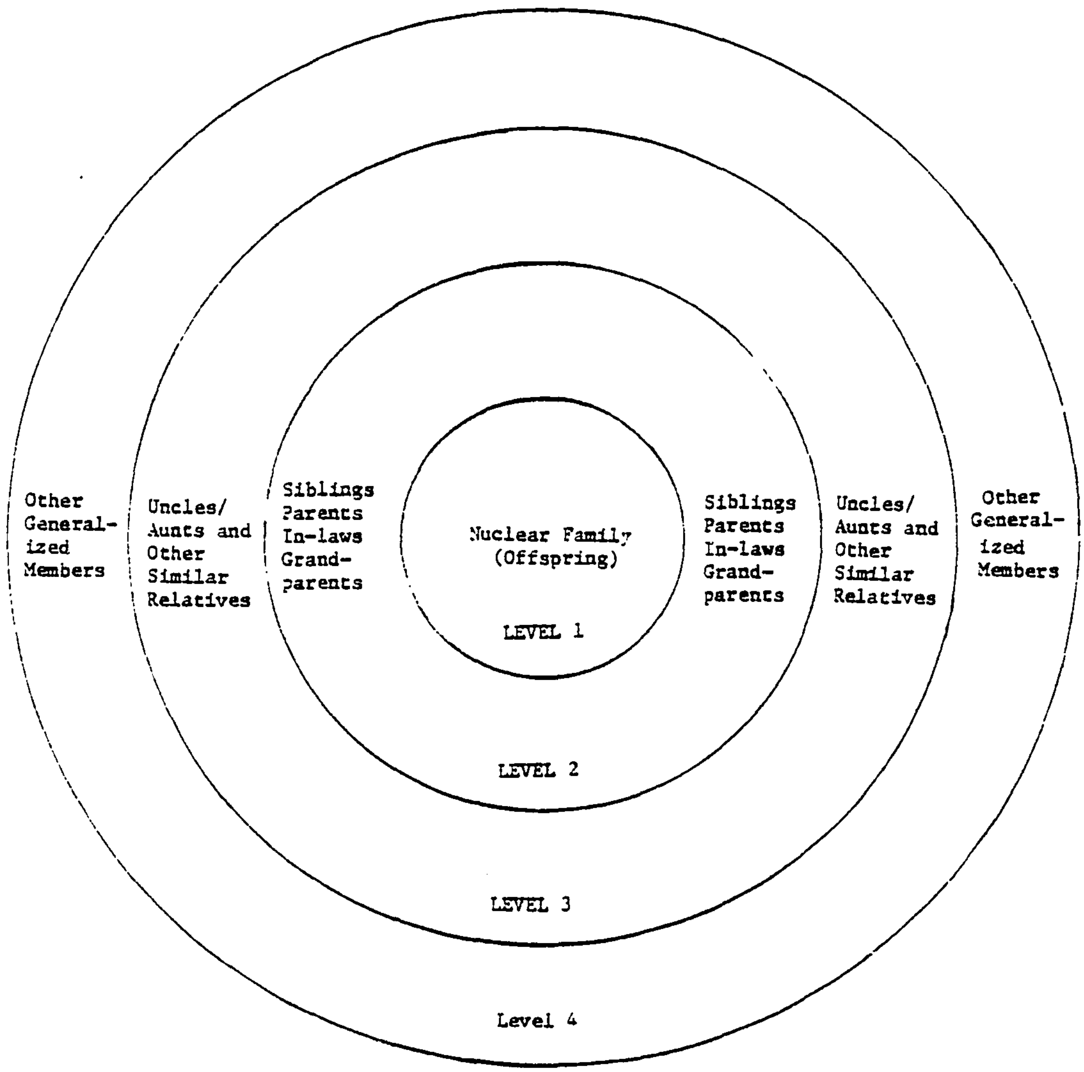

Figure 10. Categories of Ego's Kin in a Batak Society

residential pattern, household fusion and fission, sex-role differentiation in the utilization of niches, and sharing.

(1) Residential Pattern. Batak huts are never concentrated in one locality.[5] They are spread out in clusters consisting of two or three households over a wide area, strategically located in relation to various environmental zones. A hut is conveniently situated close to a river or to a creek, to secondary growth forest and to some nearby patches of virgin forest. Proximity to the river which takes care of their washing, cooling and bathing also provides ready opportunity for women (who are free from other activities) to fish and collect other fresh water products. Accessibility to second groth forest enables the women and young children to readily collect mushrooms that are abundant during the rainy season. Collecting of this highly desirable but perishable food demands a daily early morning check up in their habitat for approximately three months of the year from July to September. Accessibility to fast flowing streams enables the household to wash out poison from wild tubers.[6]

From May to July, 1980, I recorded the number of households that were producing kurot meal. On one side of the mountain range, eight

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[5]Except in the Village Center, since they are required by the government to maintain the place. Although the huts are clustered here, these are only considered as temporary abodes during village meeting, marketing during weekends, or when there are tourists to entertain.

[6]Kurot (Dioscorea hispida, Dennst.), the most abundant and prolific wild tuber, is poisonous. The toxic juice, dioscorine (Alimane 1978), has to be removed before the tuber becomes edible. The detoxification process involves soaking thin slices of the tuber in warm brine for one hour and rinsing them at the flowing river or stream overnight. A fast flowing stream or river is ideal.

households were found to be producing kurot meal while five on the other were not. While all the households observed have equal access to secondary growth forest where kurot grows, they do not have equal access to a flowing stream. The five non-producing households were some thirty-three times farther from the flowing stream than those producing ones (N=8). This seems to indicate that utilization of certain forest products depends on where the hut is situated. Establishing clusters of a few households distributed over a wide area enables them to systematically utilize the resources situated in the different zones.

(2) Household Fusion and Fission. Their household structure changes frequently. This is brought about by either brief or extended visitation of relatives and friends from other parts of the village during various periods in one agricultural year. Foods derived from various zones are pooled and collectively consumed in the host's household.

Household fusion and fission move food and people around the area. In the process food is shared or re-shared directly or indirectly among households giving everybody equal access to the total food base in the entire Batak territory. Moving people around rather frequently and regularly is a social process that may evenly distribute the utilization pressure on their resources hence may be preventing the concentration of load on one ecotype.

(3) Sex-Role Differentiation in Utilizing Niches. There is a systematic way of utilizing their various food zones. Rivers and creeks are dominantly tapped by women while lowland coastal areas, kaingin fields and secondary or other regrowth forests at 200 to 1,000 meters elevation are equally explored by men and women. Since the

utilization of virgin forests at 1,000 meters and higher elevation demands high energy requirements, this zone is largely the male's domain.

Giving one sex group more prerogative in the utilization of one ecotype may enable one to develop mastery in an area, which improves production efficiency since the unnecessary wastage of energy caused by the hit-and-miss strategy of an unskilled worker may be prevented. Furthermore, the division of responsibility in the collection of resources enables them to utilize the resources simultaneously. For example, having men collect commercial forest products for cash to purchase rice while the women fish in the river may realize a perfect complementary system. In the process both carbohydrate and protein foods are obtained simultaneously for consumption. <u>For a population whose food is largely stored in nature, simultaneous collection of different types of food may be nutritionally adaptive</u>.

Certain strict sexually-defined functions during certain parts of the year, give the population an advantage to explore two or more food zones at the same time. One of the Batak traditions is the practice of rice palay ritual harvest. A field never undergoes the "harvest proper" without going through a ritual harvest locally known as <u>tarakabut</u> (see section on "Belief and Ideological Orientation"). Since every household having a swidden must observe a tarakabut, the number of tarakabut in one harvest season should equal the number of such households. Tarakabut is <u>only</u> done by women (a symbol of fertility).

While the women observe the tarakabut, the men hunt in the forest. The catch is to be shared with all women participants. This meat will go with the first cereal cooked from the tarakabut rice. In 1980, the first tarakabut of the year was observed in the first week of August and one of the men (my ceremonial brother), using a muzzle-loaded shotgun, shot a 20-kilogram wild pig. The meat was shared among the twelve women participants.

If one considers the amount of protein that the men provide from hunting and the amount of rice as women move around from one farm to another in a 22-household village observing tarakabut, the quantity is substantial.

Since there is no species-specific requirement for the meat that will go with the tarakabut rice, hunting is not necessarily limited to one species thus an "over-kill" is prevented during a normally two-month tarakabut season.

(4) Sharing. Sharing is a form of social intercourse among households and individuals made concrete when economic items change hands. Since not all households will have access to all resources, theoretically, some will have to forego certain food items. For instance, the five households mentioned earlier did not produce kurot meal since they did not have access to the flowing stream. However, inaccessibility to a resource will not necessarily keep a household from consuming it. Data show that from May to June, 1980, around 20 kilograms of kurot meal was consumed by these non-producing households. Where did they get it? It was a gift. It was given by some of the eight producing households. Through interhousehold food sharing, food resources are spread around making them available to other households.

Sharing is not only limited to food, however. Other economic items such as stimulants (tobacco, betel nut and leaf), labor, tools, information, swidden plots, and wild resin camps may be involved. This we will see in great detail in the later chapters.

Personal achievement and self-aggrandizement are downplayed and prestige generally associated with gift giving in other societies is never apparent among the Batak when food is shared. This is almost universal among hunters and collectors (see Lee 1982; Clastres 1972). It appears that the motivation to give, aside from the material implications of interhousehold food sharing, is the fulfillment of one's social responsibilities and obligations as defined by the norms which correspondingly entitle him to the same privileges from others both on a short- and long-term basis. One strong case in point was demonstrated when a father of two young children brought home some bunches of wild fruits. The two young children fought to get the bigger share. When the younger one grabbed the last bunch the father took it away from him to give it to his young nephew on the other side of the forest. He did not mind his own child who was crying for more. The scene reflects the symbolic dimension of food giving. There are a number of beliefs that seem to reinforce this practice. Generally, they believe that one who is greedy may be physically harmed or may become a poor hunter, collector/gatherer, or may have a poor harvest.

Belief and Ideological Orientation: The Batak are animists and their belief system emphasizes equality for everybody. To them the forest, the rivers, the birds, and all the natural things around them are gifts given by the Panginu-un living in the "beyond place." They are only stewards and it is their responsibility to see to it that each of them gets what is due him. What one hunts is not for himself alone but also for others. He is only the instrument and through him the gift was given by the supernatural. I saw this idea expressed many times by successful hunters.

In one instance, I saw a successful hunter coming home very quietly. He never said, "I caught one." He put his catch on the ground and silently sat in the corner. He was the most meek and humble person in the group. The others did the cleaning, the pag-pasda-en (the sharing) process, and they did the shouting, singing and other expressions of joy. In fact in the sharing, the hunter himself did not receive the most. Of the fifteen kills that I was able to observe, there was not a single case where the hunter received the largest share. In fact, in eight of these cases, the hunter received one of the smallest shares.[7]

When rice is ripe, a Batak has to share this with all the spirits responsible for protecting it. Two supernatural worlds are involved here: spirits in the "here place" (the Panya-en, the Tumalu-nen, the Kalag, and the Uyaw[8] living in rivers, fallen timbers, rocks, stones,

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[7]This appears to be a common behavior of a successful hunter among hunting populations. In some groups, a successful hunter, in fact, is tabooed from eating his own catch. Eating his own catch will bring him bad luck (Clastres 1972: 168).

[8]The Tumalu-nen is believed to be the owner of the whole forest land where the Batak live. The spirit has two personalities: that of being benevolent, and that of being malevolent. The relationship between a Batak and the Tumalu-nen is likened to that of a son (represented by the Batak) and to that of a father (represented by the Tumalu-nen). When the Batak is good (defined as being kind, or generous), the Tumalu-nen is benevolent. Otherwise, its malevolent personality gives the Batak two possible penalties: sickness which may bring one to death; or making them hungry all the time due to poor catch, scarce honey,

and other related places); and the god (Panginu-un)[9] in the "beyond place." The spirits in the "here place" are malevolent but can be benevolent if the Batak maintain good relations with them by following properly the required ceremonies and rituals. The god in the "beyond place" is always benevolent. In one way or the other, these spirits are responsible for the ripening of the rice grains and therefore they get their share through the sagda (offering).

During the tarakabut, each woman fills her own bugyas[10] with unthreshed rice that will eventually be hers after the ceremony. All adult women in the community may participate and after filling their baskets, they go up to the house of the host. A mat is spread at the center of the hut where the filled baskets will be placed together. The host burns wild gum or resin and carries it around the stack of baskets. He sprinkles water and wine (if available) around the mat and places finely cut tobacco close to the baskets. Then each woman takes her rice-filled basket home.

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and poor harvest. The Panya-en, on the other hand, is a spirit living in the forest, but not the owner, who lives on human corpses. Unlike the Tumalu-nen, this spirit has only one personality, malevolent. It does not eat living but dead people (of the spirit's choice) who died of the disease that was inflicted on them. The Kalag is the spirit of the dead Batak who protects the living from misfortunes. The Uyaw is a spirit of fertility. It always goes with the living male and female individuals and helps them to be productive in their food quest. It also makes a man successful in impregnating a woman or deters him from doing so.

[9]This is a Tagalog term suggesting a Batak adoption from other ethnic groups.

[10]The tarakabut basket container can hold 7 kilograms of threshed rice palay, on the average.

The tarakabut ritual is essentially a ceremonial act of welcoming the rice spirit, the Batak claimed. They believe that rice has a spirit which fills the rice husk. When a rice grain is planted and starts to sprout, the spirit is released and wanders around. It travels unceasingly to far places. When the rice palay is ready for harvest, it is a sign for the spirit to return. They believe that this spirit is anthropomorphic hence its needs after a long travel are similar to a man's, like the Batak. First of all, it will be thirsty, hungry and would want to smoke or chew tobacco. Thus, water, rice (pinipig[11]), and tobacco constitute the essential elements of the sagda and all the rest are trimmings depending on the host's capability to add them.

There is a strong sharing overtone in the ceremony. This is further articulated in the way rice is shared with the tarakabut participants.

Their rituals and religious ceremonies are centered on the offering. It serves a number of purposes one of which is thanksgiving. One should express his gratitude to the supernaturals for the benefits received such as a good harvest or recovery from illness. After the harvest season, a feast is observed not only because food is abundant during this time but also it is the time for expressing thanksgiving to the spirits.

Whenever a person recovers from illness, it is believed that both the benevolent and the malevolent spirits saved him. When recovery from

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[11]Very young palay is harvested, roasted, and pounded. The husk is removed and the cereal eaten. It produces a mouth-watering smell.

illness takes place during periods of extreme food scarcity, the thanskgiving feast is usually deferred until the thanksgiver is ready. Others who believe that they were saved from a very serious illness, feel obligated to celebrate the feast immediately. Food contributions from relatives will help them to do so. In this context, food is shared to enable the celebrant to give thanks to the spirits. Sagda is always observed first before the food is served to the guests.

Religious offerings are also a way of cajoling the spirits to do some favors, such as giving proper direction in the forest to hunt; finding the proper site to make a swidden plot (the ritual is locally known as mag-imara); making a correct diagnosis (when a medicine man sings the diwata or dances the tarek which are both diagnostic and curative processes) of the patient's illness.

The egalitarian social system of the Batak is commonly expressed in the way individuals behave in relation to one another. Age-grading is never apparent. Joking is spontaneous even between individuals belonging to two different age levels.

Their system of equality is shown by this comment I heard many times: "Dagwa agalen ka't Batak!" (There is no master among the Batak!).

Their values and norms stress equality. Batak should experience equal intensity of abundance and scarcity. Sharing resources therefore is a way of sharing plenty and want. This value is reflected in many of the Batak stories. They involve a number of plots about a Batak who wanders through the forest for a number of days and runs out of food. But suddenly a strange man appears either bringing or teaching a Batak the technique of how to prepare food from what is available in the forest. When the Batak is full, he goes home and brings the extra food to be shared with the people in the camp.

The ideology of egalitarianism expressed in their sociocultural subsystem provides each Batak equal access to the use of the resources in their ecosystem. There is evidence however, as we shall discuss later, to show that the introduction of cash into their economic system slowly but surely will erode the value.

Technological Practices: The Batak have to deal with five different biotopes. In their mental map these food zones are clearly defined. The system for synchronizing various foraging activities and swidden agriculture with the seasonal availability of resources is well delineated. Their activities in these areas are not based on a hit and miss strategy. They are made on the basis of a highly reasonable prediction based on their intimate familiarity with the location of these food types in various parts of the forest. Figure 11 shows the relative intensity of the supply of various sources of food and their swidden activities in one agricultural year (1980-1981).

Environmental mapping, however, demands updating. Although they have a general idea of the floral and faunal associations in each zone (see Chapter III), short-term use of any of these zones demands a constant flow of new information. Since one cannot be in all of these zones at one time, especially for people who are becoming more sedentary, new information has to come regularly from somewhere else. Other Batak in the neighborhood or from other communities, through information sharing (see Chapter VIII), are the media.

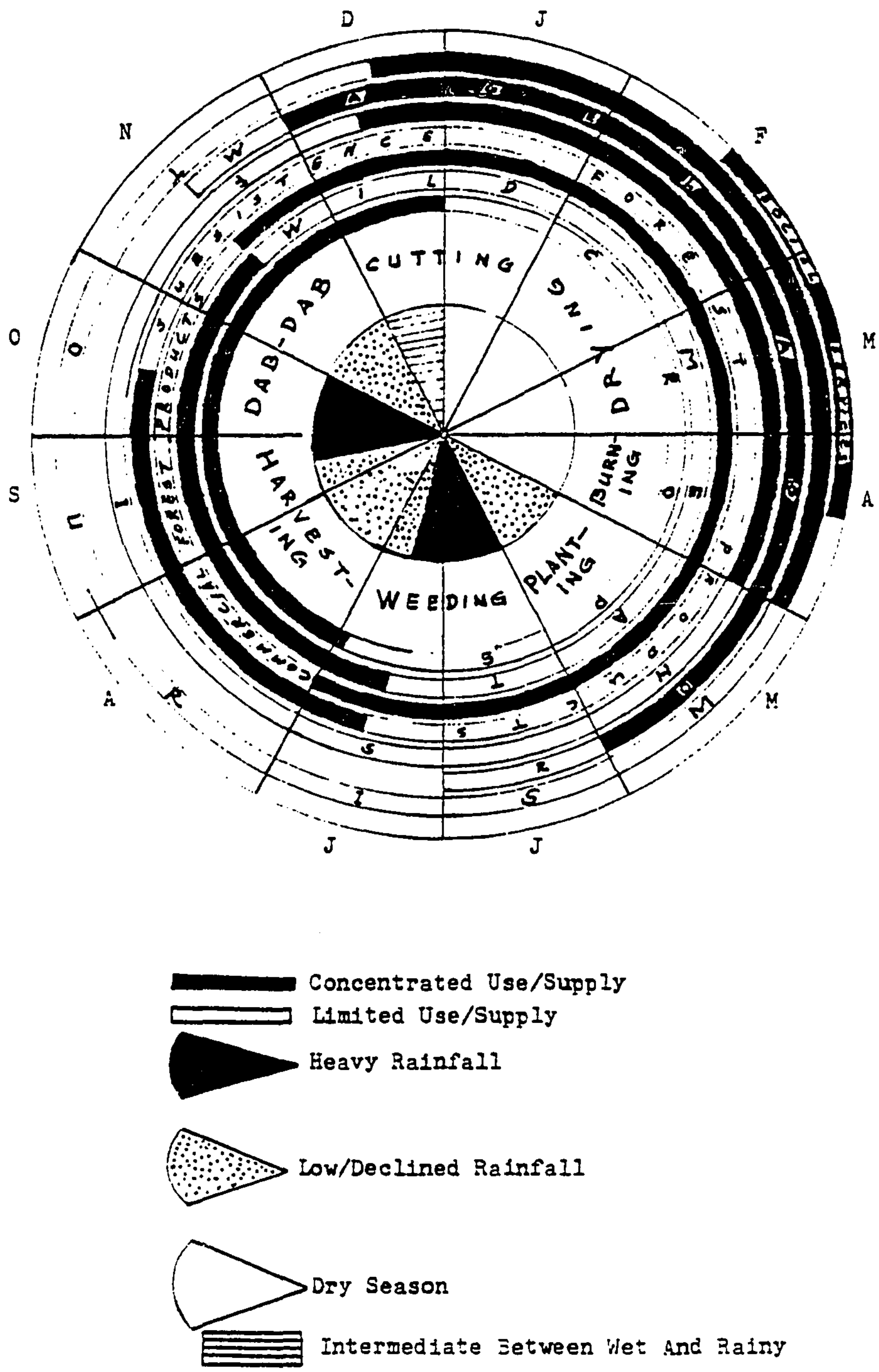

Figure 11. Calendar of Resource Use/Supply and Swidden Activities.

This is facilitated through conversation at any time of the day. Noon, afternoon or evening chatting or talking among adults and even children should not be considered as a non-productive activity (also see Lee 1979). Around 67 percent of the time spent in conversation or chatting involved information transfer concerning food resource conditions in various areas as well as job opportunities in the neighboring communities.[11]

The multiplicity of their food zones demands multiple subsistence strategies. These activities have to be synchronized if the limited resources available in different zones are to be utilized efficiently. Obviously, this demands an adequate labor supply from the household. Conceptually, their food production system constitutes what we might call <u>integrated subsistence pluralism</u>.

In this system each food production activity is an integral part of the complex. Other subsistence activities revolve around one major subsistence technique, in case of the Batak, the swidden. In fact their residential location is essentially determined by the swidden cycle. The system is flexible, which allows the addition of new forms of food production techniques whenever opportunities demand as well as the elimination of others when the ecological balance is threatened.

Six types of economic activities are involved in their food production system: hunting (Appendix F), fishing (Appendix (G), collecting subsistence forest products (Appendix E), collecting

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[11]I collected data on how their entire waking hours were spent. This was carried out for one solid week every other month for twelve months for each of the seven household cases.

Plate XI. A Woman Hook-and-Line Fishing Solitarily.

Plate XII. A Group of Women on their Way to Collect Mollusk and Fish Using Hook-and-Line.

Plate XIII. Men Spear Fishing in River.

Plate XIV. Fresh-Water Eel Catch.

commercial forest products (Appendix D), wage labor, and swidden agriculture (Appendix C). How are these activities observed in one agricultural year?

The intensity of use of one subsistence activity changes from month to month depending on the availability of labor in the household and the demand for such activities (see Figure 12). For instance, the collection of commercial forest products is at its lowest during the month of July when they are extremely busy tending to their growing and ripening swidden rice fields. However, if we compare the number of hours spent by each of the seven case-households, CYCLE III-1 household which has the largest labor force, still spent five times as many hours collecting commercial forest products compared to the other case-households during this month. On the other hand, since wage labor depends on labor demand from the lowland peasants' farms, there are certain months of the year when the Batak labor force is totally free from wage labor. This happens during the harvest season when the Batak labor is not needed by the lowland farmers while the Batak themselves are busy harvesting their own fields. But by the time swidden clearing starts (December), wage labor begins to rise until the planting season in later April and May. Since demand for wage labor coincides with their swidden clearing season, they have to carefully balance their time budget so their own swidden fields are not neglected.

Hunting, on the other hand, reaches its peak during the month of October when meat returns from wild pig are profitable (see Appendix F). During this month, women join the men in a special collective hunting known as <u>sagbay</u> (see Venturello 1907: 554). Sagbay involves pooling

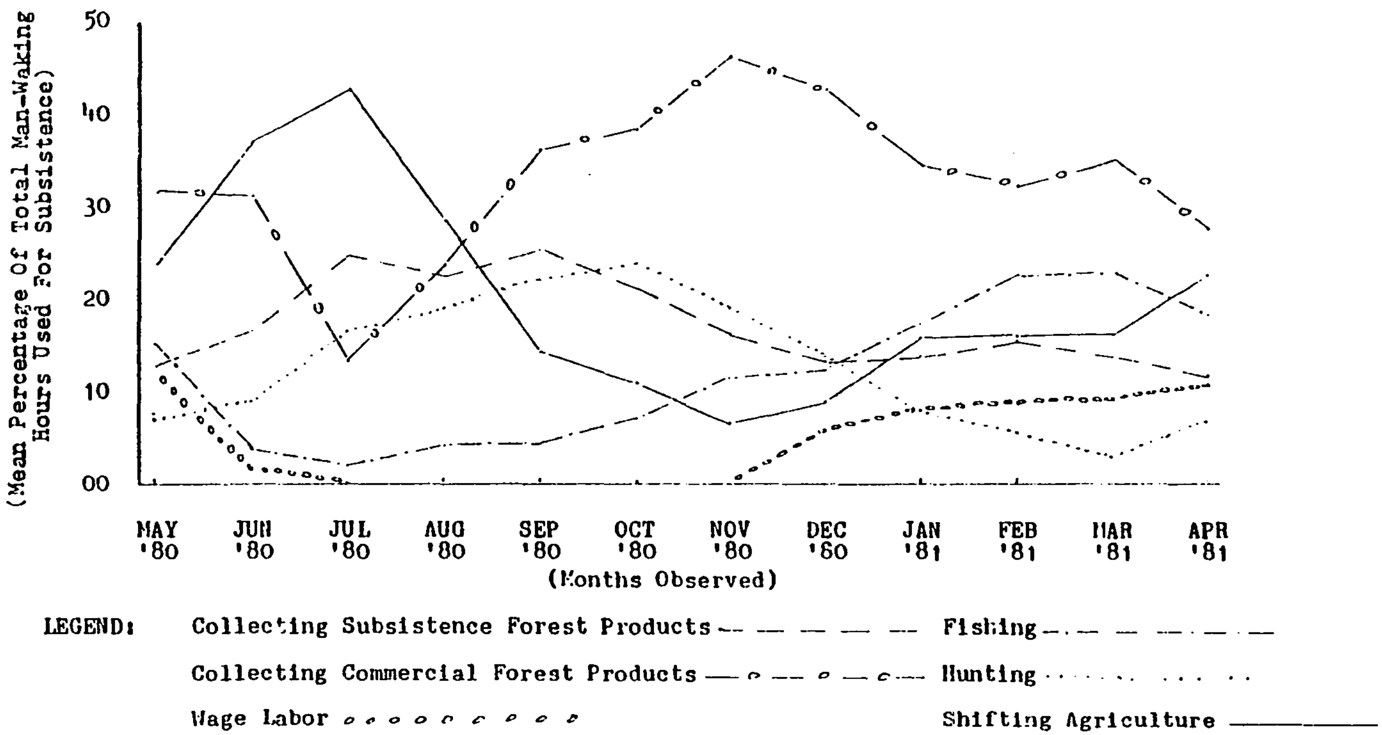

Figure 12. Mean Percentage Curve of Man-Waking Hours Spent by Seven Household Cases Per Week Per Month for Six Subsistence Activities in One Agricultural Year (May, 1980 - April, 1981).

of weapons, food resources and manpower, while the catch is shared among the participants.

Fishing, which is essentially pursued by women, follows a more or less constant intensity compared to other subsistence activities. Nevertheless, it decreases slightly during the rainy season and returns to its normal level during the dry season.

Swidden agriculture activity never drops to a zero point in any month of the year. It only declines after harvest and quickly intensifies when tree cutting starts. After harvest, swidden fields that were made from virgin forest are cleared for sweet potato and cassava crops, a practice locally known as dab-dab. After planting, minimal maintenance activity is sustained until they are ready for harvesting during the month of December in time for the beginning of tree cutting. The maturing root crops constitute a stored food underground when men cannot do other things but cut trees for the next planting season.

On the basis of the data I collected from the seven sample households, it is estimated that, on the average, an adult household member spends around 53 percent of his total man-waking hours[12] for immediate subsistence or food production purposes. The rest are spent for domestic activities (13 percent), tool manufacturing and maintenance (7 percent), illness (4 percent), child care (4 percent), conversational activities (12 percent), and other forms of leisure (7 percent).[13]

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[12] The average man-waking hours is 14 per day.

[13] SUBSISTENCE includes travel, hunting, gathering, horticulture, exchange, hired labor, and other related activities. DOMESTIC includes dwelling construction, repair, firewood collection, hearth maintenance, food processing, cooking, material collection, clothes washing, eating, betel

Plate XV. Entrails and Head Parts of Wild Pig.

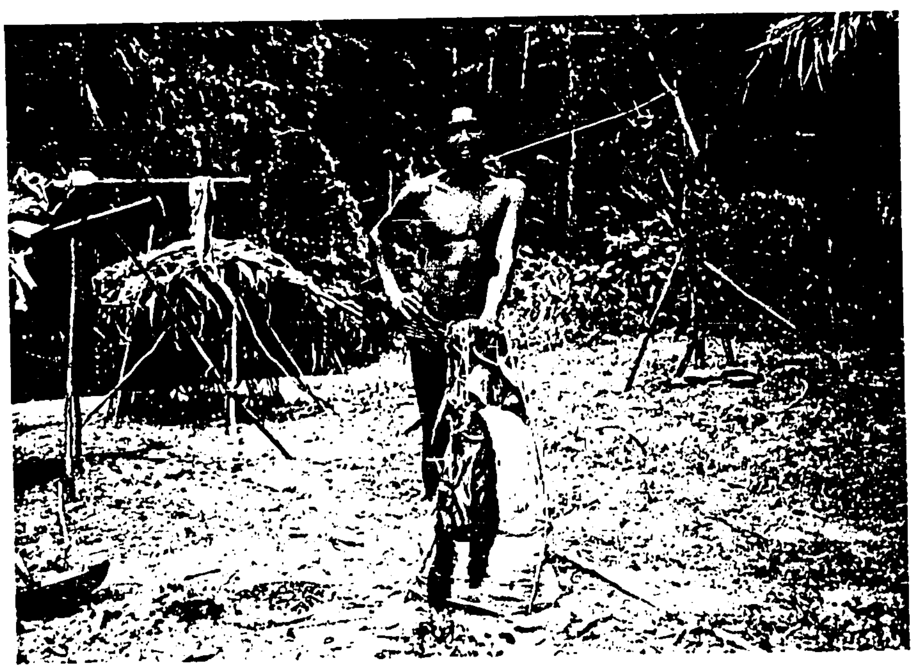

Plate XVI. Flying Squirrel Caught While Collecting Wild Resin (in sack).

The subsistence strategy of the Batak is opportunistic. Its opportunism is characterized by the mutual benefits nature receives (environmental integrity preserved) and the food the Batak derive as well as the services the larger society has been rendered.[14]

The Batak economic system can hardly be described as dualistic. The classical notion of a dual economic system does not seem to apply to a population that has begun to participate in a monetized trade. The Batak economic system does not accurately reflect the relation between the "traditional" and the "non-traditional" sectors in a dual economy. Inherent in the "dual economy" concept is the discreteness of the two sectors and the equal and constant intensity of use of the monetized (modern) and non-monetized (traditional) sectors of the economic system over time (Higgins 1979: 7, 305; 1968). The Batak's own system forms a continuum from the purely non-monetized to the monetized. Both are integrated and not necessarily separate sectors. Along this line, their economic activities move back and forth (from non-monetized to monetized and vice versa) with intensity varying over time depending on the circumstances, opportunities and expediences.

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preparation, and other related activities. TOOL MANUFACTURING AND MAINTENANCE includes bows, arrows, spears, paltik, bolos, mat, basket, and pouch weaving and making, and other related work. LEISURE includes grooming, adornment, sleep, play, betel nut chewing, drinking intoxicants, and other related activities. CONVERSATIONAL ACTIVITY includes story telling and chatting. ILLNESS includes inactivity due to injury and recuperation from illness. CHILD CARE includes nursing, cleaning, "guarding," fondling, discipling, instructing, feeding and other related activities. (Definitions based on Estioko-Griffin and Griffin, MS, n.d., used in their Agta research in Northeastern Luzon.)

[14]They provide the commercial forest products badly needed in the city of Manila and the labor for the lowland peasant farmers' fields.

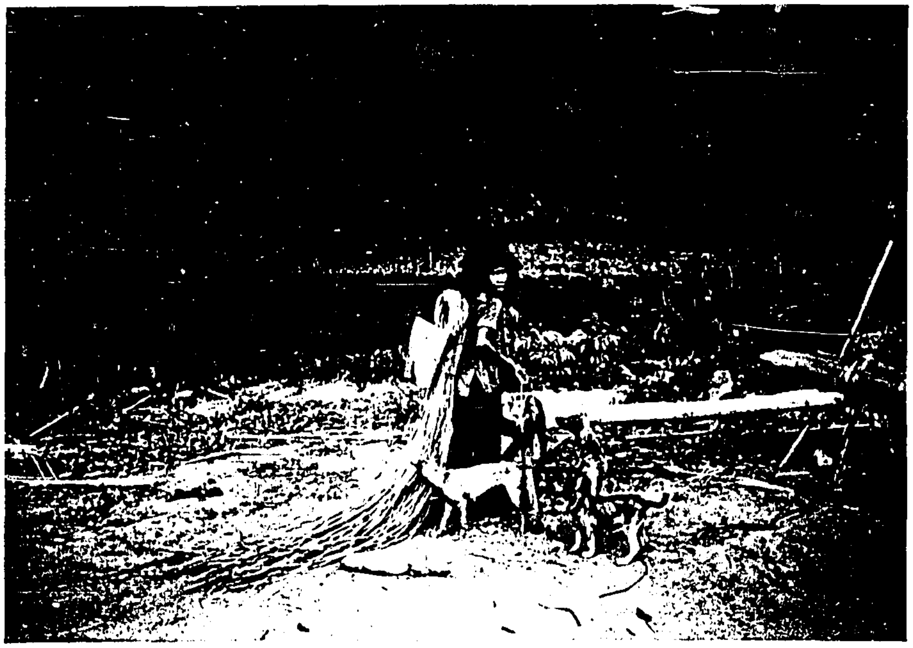

Plate XVII. Rattan, Honey, and Orchid to be Sold in the Lowland Market.

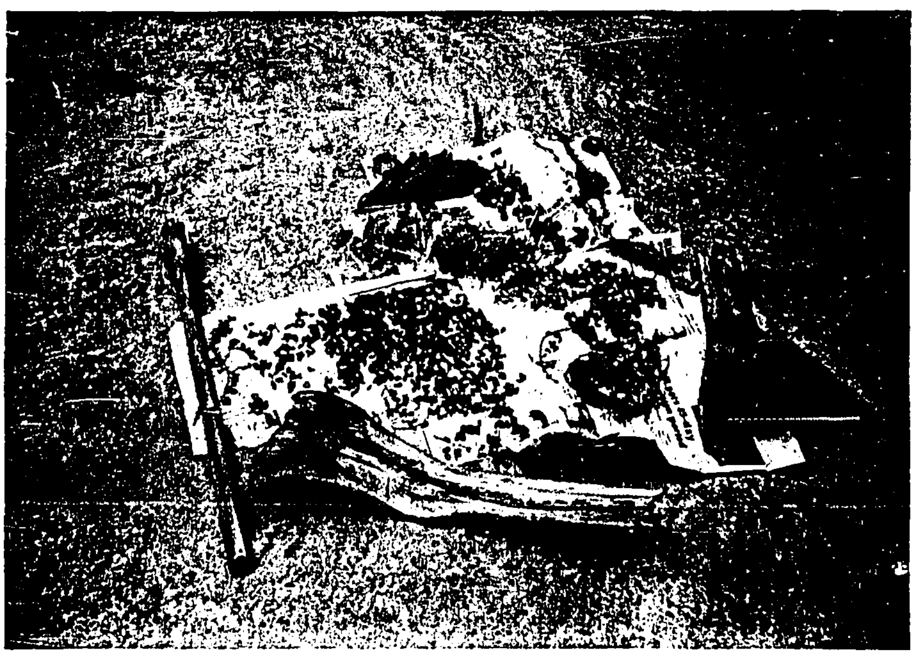

Plate XVIII. Dried Samples of Various Edible Berries and Nuts.

Plate XIX. One of the Wage Labor Opportunities--Clearing an Airstrip for a Missionary Organization.

Plate XX. Another Wage Labor Opportunity--Planting Swidden Field Owned by a Lowland Farmer.

CHAPTER VI

PRODUCTION, DISTRIBUTION AND CONSUMPTION: ECONOMIC SUBSYSTEM

In spite of the multiplicity of their food production activities as we have just outlined, the Batak still have to face cyclical food scarcity aside from the gross decline of their caloric production. That they are facing a gross progressive caloric decline is held as a constant in this study, an assumption already empirically demonstrated by the current literature dealing with this phenomenon (Eder 1977a; 1978).

What is the timing and intensity of the cyclical food fluctuation of the Batak? These are issues central to our understanding of their food management system. To gain further insight into this system, food distribution and consumption practices are analyzed in the context of the regular cycle of caloric scarcity.

Production

To document all the calories that contribute to the total household food production is an extremely complex task. Although the study attempted to collect exhaustive data on production, some information might have been missed. Production data (in calories) in this study, therefore, serve only as an estimate to identify the relative differences in production levels during various time periods in one agricultural year. Three such periods are essentially distinguishable: harvest period (from August to September); post-harvest period characterized by declining food supply (from October to January); and, the pre-harvest period of relative scarcity (from February to July).

Overall annual mean food production is an unrealistic estimate because of the extremely large difference in food production level during these three periods.

The data suggest a relation exists between the stage of the family life-cycle and per capita caloric production[1] in the household. Although all households experience the same pattern of food fluctuation from one harvest season to the next, the absolute level of per capita production in each of the seven case households during that span of time varies. Figure 13 indicates that the higher the household's dependency ratio (a household characteristic that changes as the family life-cycle stage changes), the lower its per capita production. It appears that the labor supply and the number of consumers in the Batak household predicate the household's food supply level.

Swidden rice harvest is critical to their food supply level. Caloric production during harvest jumps from eight to thirteen times that of the pre-harvest period. This brief abundance lasts for two months, followed by a sudden decline for a period of four months (post-harvest). During the post-harvest period, food production decreases by 70 percent. In the period of relative scarcity (pre-harvest), which lasts for another six months, food production continues to decline by 90 percent. The dramatic decline of food supply during the post-harvest

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[1]The "total household caloric production" is not an appropriate measure for household food supply. This measure does not take into account the number of dependents and consumers in the household. In my analysis therefore, the unit of measurement will be "per capita caloric production" in the household.

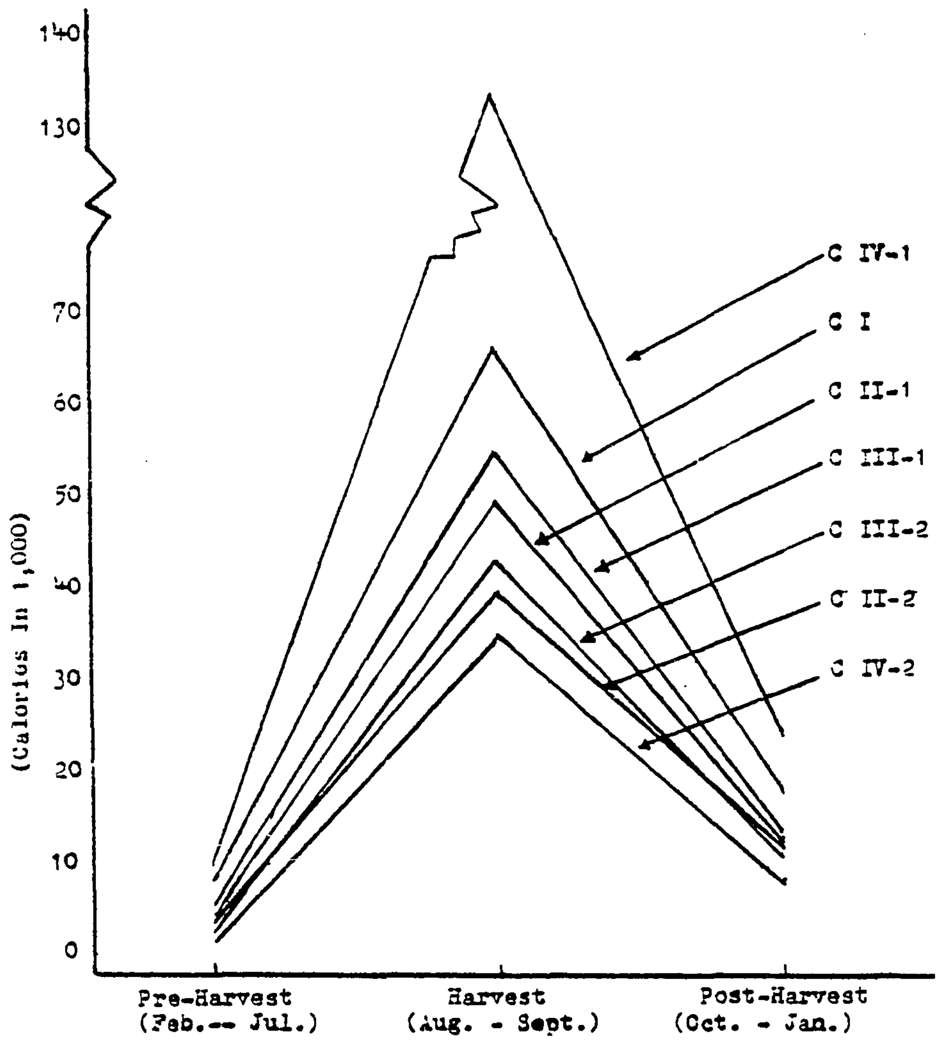

Figure 13. Mean Weekly Per Capita Caloric Production Estimates of Seven Household Cases During Three Different Periods.[a]

[a]These are estimates computed from the weekly production data of the seven household cases collected on a bi-monthly basis. C I has 0 dependency ratio (number of non-working-age divided by number of working age); C II-1 has .5; C II-2 has 1; C III-1 has .5; C III-2 has .67; C IV-1 has 0; C IV-2 has two members aged 65 and older.

period suggests an abnormal rice consumption during the harvest period. This we will deal with in a later section.

Shifting agriculture constitutes the major food production activity of the Batak. However, food supply from this source lasts only four months after harvest and then dwindles to almost nothing for six months. Table A-11 (Appendix A) indicates that during these months the amount of swidden rice is negligible while that derived from the collection of commercial forest products increases up to 60 percent. During the harvest period, the latter food source no longer contributes to the total household caloric production.

The pattern of caloric contribution from wage labor is similar to that of collecting commercial forest products, though the former is lower. While the latter activity contributes around 60 percent, the former adds only 10 percent to the total caloric production during the period of relative scarcity.

Two patterns of food supply prevail, one mainly from locally produced food during the harvest and post-harvest period (August to January) and the other from food purchased with cash from labor and sale of commercial forest products during the pre-harvest period (February to July). Eder (1978: 59) estimated that around one-half of the total carbohydrate supply is taken from wild root crops and the rest from rice. This annual gross estimate misses the cyclical caloric contribution from different food sources to the total household food supply (see Table A-12, Appendix A).

The Batak food niche changes cyclically following the seasonal availability of food resources. Using the resource diversity and niche width or breadth indices,[2] this change can be empirically demonstrated.

During the pre-harvest months characterized by food scarcity, the highest index[3] of niche width or breadth is registered indicating a relatively even proportion of resource utilization (Figure 14). In this manner, the continuing caloric drop during this time is arrested, acting like a check-valve, by the pooling effects of the sum of food resources obtained from the different niches. The pre-harvest period coincides with the summer months when water supply is critical to biotic re-generation. Intensive utilization of one resource may lead to over-exploitation and eventual extinction. Opportunism and flexibility therefore are the rules, expanding the niche width during this time. Nearing the end of this period, the declining density of the resources is inevitable. The coming of the harvest provides an opportunity to relax the pressure on these resources.

During the harvest months, resource diversity is at its lowest and the proportion of resource use is most uneven as indicated by its lowest index of niche width (Figure 14). There is an intensified use of

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[2]Resource diversity index is measured by the absolute "number of different resources . . . [tapped] regardless of their proportional contribution" to the total caloric production while the niche width or breadth index is measured by the proportion of food each resource contributes to the total food production in the household (Christenson 1980: 34).

[3]The index can vary from "1" where "one resource is used exclusively, to _n_, where all resources are used in equal proportion (Christenson 1980: 34; Hespenheide 1975: 166-168). The bigger the index, the more even is the utilization of the different resources.

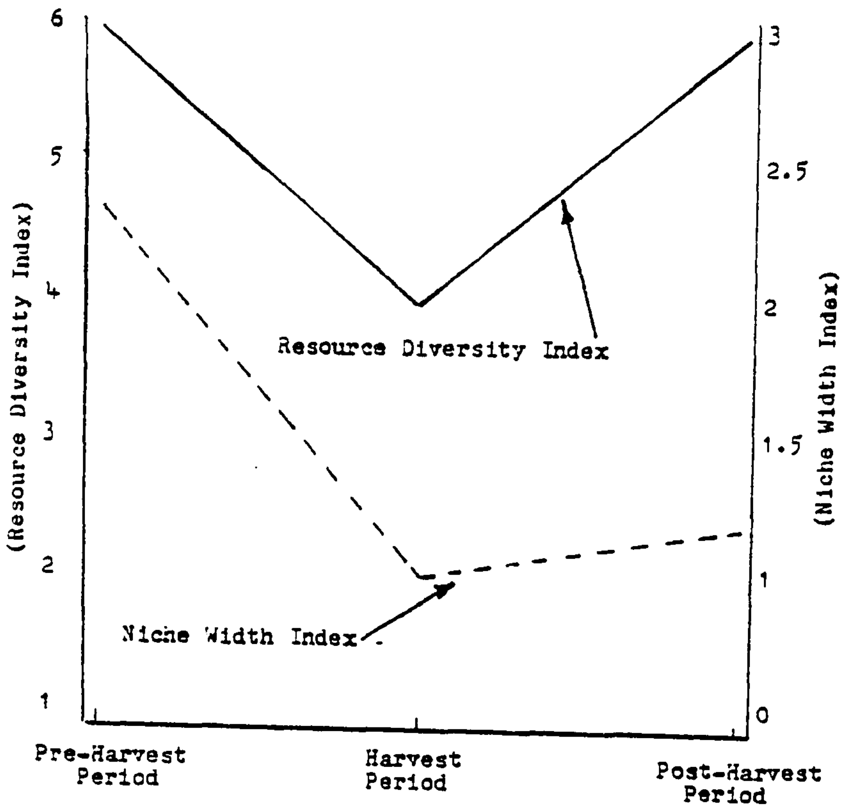

Figure 14. Resource Diversity and Food Niche Width (B)[a] Indices Curve During Three Periods of Food Availability.

[a]This is computed by using the following criterion:

$B = (\sum_{i=1}^{n} p_i^2)^{-1}$; where p_i is the proportion of resource i in the total production and n is the number of resources used (see Christenson 1980: 34; Hardesty 1975: 76).

swidden products. At this time, to obtain this type of food resource from their fields requires the least amount of energy while the economic return per unit of energy expenditure from other resources is no longer profitable because of their dwindling density resulting from their intensive use during the previous months. Released from the feeding pressure, these resources are allowed to regenerate and increase their density until the next summer season.

Although the resource diversity index during the post-harvest period is just as high as that of the pre-harvest period, its niche width index is closer that of the harvest than to that of the pre-harvest period. This suggests that during the post-harvest period, the Batak start to utilize the other resources they had temporarily left alone during the harvest period. Nonetheless, it is still at a low level since resource use of swidden products continues. The appearance of other food production opportunities during this time, such as wage labor, can increase their resource and procurement diversity. Because of the availability of their swidden products during this time, the Batak do not have to intensify their participation in the wage labor market unlike the months of scarcity. This situation also holds true when they resume the collection of commercial forest products during this period.

Distribution

Food produced by a household is not necessarily consumed by that particular household. There are a number of mechanisms that will make a portion of such food find its way eventually to other households. Around 15 percent of the household swidden rice production goes out to other households as tarakabut rice while another 20 to 25 percent as binlad rice for those who helped in the harvesting proper. The uninhibited food intake during the harvest season by the household members, the harvesters, and the casual household visitors; and during the feast, comes to 30 to 40 percent. This uncontrolled eating habit during this season is further supported by the substantial increase in the mean body weight of the Batak at this particular time span (personal communication with Eder, 19 April 1982).[4] Whether or not this is a strategy to prepare them physiologically for the anticipated period of caloric decline is impossible to substantiate in this study.

After harvest season, only around 20 to 35 percent of the total harvest is left for household consumption in the succeeding months. Although the amounts of food given out and received by a household during harvest season are almost equal, the food outflow generally exceeds the inflow in a majority of cases. Profuse food giving and receiving during the harvest season makes real sense. What is given out constitutes a "social stored food" retrievable later by households when they experience short caloric supply during the period of food scarcity. It should also be recalled that the swidden fields are never planted simultaneously probably at least in part because of the collective planting by turns.[5] It is not unusual to find fields planted at

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[4]The analysis is based on the seasonal weight data of the Batak he collected in 1980-1981.

[5]Planting an open swidden field under the heat of the sun is an extremely strenuous activity and the Batak reported that they prefer to plant in big groups to minimize the drudgery. Men claimed that they would rather work long hours cutting trees since the activity is done under the shade. Collective planting by turns enables them to finish a field in a shorter time.

intervals of one to four weeks. Consequently, rice crops are not harvestable at the same time, making intensive food giving and receiving even during harvest season pragmatically meaningful. While some households wait for their turn to harvest, those harvesting households provide the waiting ones the much needed rice until their turn comes. Planting fields at different times seems to constitute a technological response to their anticipated cyclical caloric stress and to the stress they have just been through.

In the pre-harvest months, food is still shared with other households but with a different intensity and in different context. The sharing of labor which involves food serving during the pre-harvest period, or the occasional feasts which, incidentally, occur very infrequently during this time, distribute food among households.

The distribution of food to other households is affected by the nature of the food involved. My data on the proportion of a particular food type shared with other households indicated that calories derived from purchased food are least preferred for interhousehold sharing while hunted, fished and collected foods have the highest preference (see Appendix Table A-12). As their traditional resources start to disappear as a result of overexploitation or ecological destruction, the demand for cash input may increase to produce alternate food resources. Consequently, the latter food type is the least likely to be involved in the generalized reciprocity. As a response, a new pattern of sharing may be pursued to preserve the sociability of the system.

Consumption

Since food is not solely consumed by the producing household, some households consume more while others consume less than they produce. From the seven sample case households there is a discernible pattern in the household's per capita consumption relative to its per capita production. During the harvest period, the households generally consume less than they produce. In the period immediately following the harvest, consumption and production almost balance though consumption still tends to be lower than production. During the period of relative scarcity, household caloric consumption substantially exceeds production (see Figure 15). Despite the conspicuous food consumption during harvest season, due to the relatively high per capita caloric production during these months, per capita consumption is still lower than production. In the period of scarcity, there is a corresponding control in their eating, bringing the rate down to even one meal a day. The exceedingly low per capita caloric production during this time necessitates lower per capita caloric consumption in some households.

It appears that the pattern of consumption is largely determined by the availability of food in the household. When food supply declines, the level of consumption has to be deliberately reduced. Colson's (1979) study on famine indicated that when food supply is low and all other food alternatives have already been utilized, the people may reduce the amount of food they eat per meal or the number of meals they take. Whichever is followed, the implication is a deliberate reduction of food intake to match it with what is available. A common saying among the lowland peasant Philippine population is: "The buttonhole should be

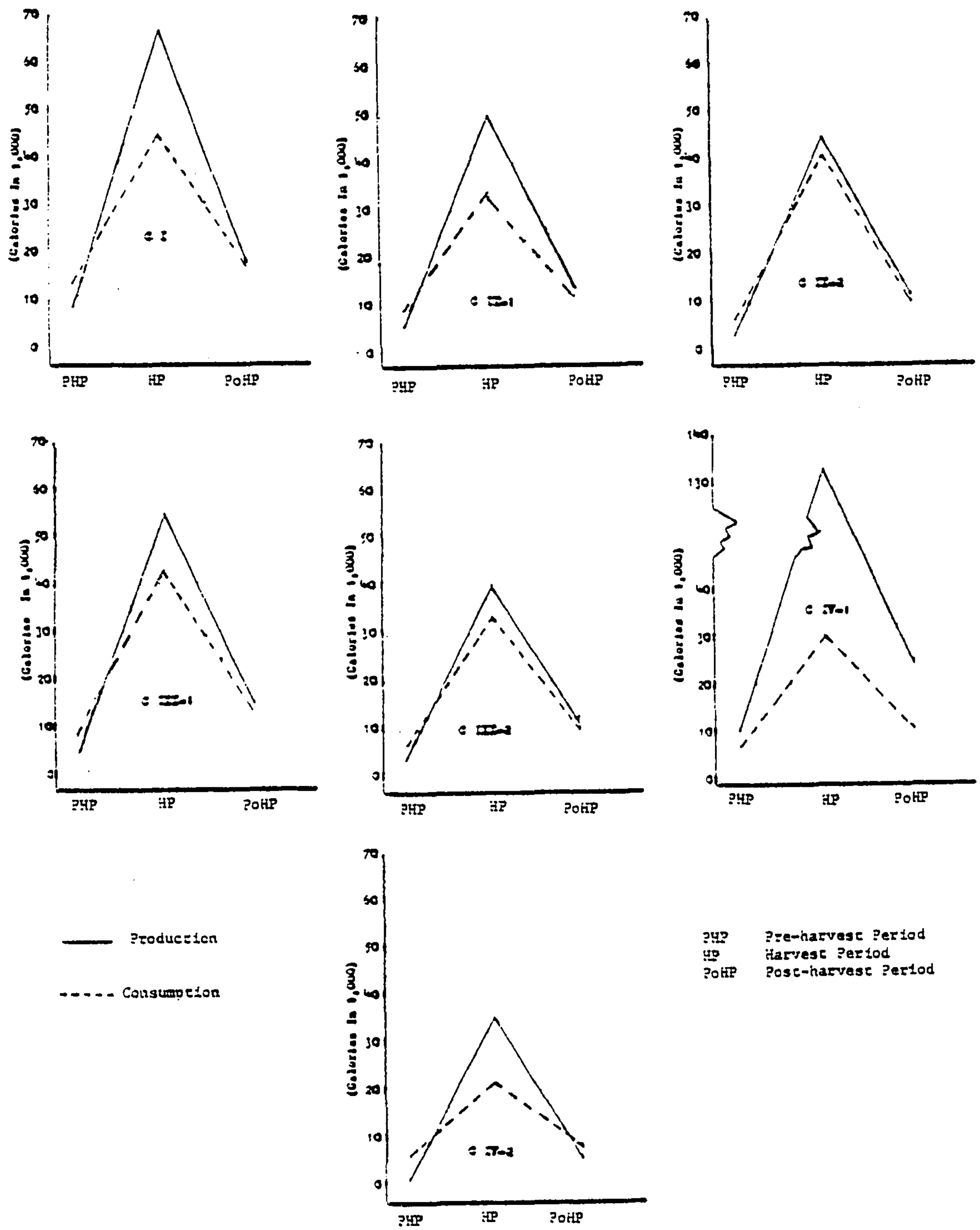

Figure 15. Weekly Per Capita Caloric Production and Consumption Estimates During Three Periods of Food Supply for Sample Households.

as big as the button." It is a strategy of adjusting to one's own economic capability, a classic but often disregarded rule in societies where one can temporarily live on seeming affluence as long as his credit line is still good and the social security system is working. Knowing that they "can survive a good deal: they can (grow thin) and still survive to fatten again (when) the good times return" (Colson 1979: 25), an idea substantiated by the increase in the Batak's body weight during the months of adequate food. There is, however, a threshold point of minimum food intake, below which there may be permanent physical damage to the human body making a person less functional. For instance, I found some people during famine season less active (also see Viteri and Pineda 1971: 25). By minimizing activity, one reduces caloric burning to conserve body energy (Taylor and Keys 1950: 216; Dirks 1980: 23). How far can a body go with this deprivation depends on a number of factors. For the Batak households experiencing this particular stress due to an unfavorable phase in the family life-cycle, additional calories are secured from other households in a favorable life-cycle phase.

Figure 15 indicates that six of the seven case households have higher caloric consumption than production during the famine season. Due to the peculiar family life-cycle characteristics of the seven sample households, six are largely dependent on other households (not included in the sample) in the population whose labor supply and caloric needs are favorable. Only one (C IV-1) of the three households that were theoretically expected to be consuming less than they produce during the period of food scarcity is actually doing so, an anomaly already explained earlier. Physiologically, the couple in C I household has higher caloric needs (see FNRI 1980: 304) compared to the couple in C IV-1 (husband and wife are in their fifties) household.

The surplus food not consumed by the couple in C IV-1 household is given to the married children who are not included in the sample. This situation indicates that the six food-dependent sample households during the period of scarcity are also taking food from the non-sample ones whose labor supply is similar if not better than those of C IV-1 households and whose caloric needs are just as low if not lower.

CHAPTER VII

INTERHOUSEHOLD FOOD SHARING: SOCIOECONOMIC SUBSYSTEM

While all the sample households showed similar timing of cyclical food fluctuation, each household does not necessarily experience similar intensity of food difficulty during periods of scarcity. It was hypothesized that such differences can be explained by the varying number of labor suppliers and consumers in the household caused by the changes in the family life-cycle stage. However, as we saw earlier and will see later in this work, the food sharing patterns of the seven sample households representing the stages of a family life-cycle of the Batak do not completely conform to my theoretical expectations. The anomaly is explained, as mentioned earlier, by the peculiar demographic and non-demographic characteristics of some of the sample cases. Also, due to the limited sample size, there was no chance of cancelling out the extreme variance between households thus increasing the skewed characteristic of the sample.

Nonetheless, family life-cycle stage still remains, as we will see later, a factor that causes interhousehold variation in food availability among the Batak. As a result, some households consume more than they produce due to the additional calories that flow into the hardest hit households from the least hit ones. This is achieved by interhousehold food sharing, one of the forms of social response to caloric stress (see Jochim 1981: 36).

Social Responses to Caloric Stress

Available literature concerning the way people socially respond to food problems are confusing and contradictory. Evans-Pritchard's (1940) work among the Nuer and Schneider's (1957) in the Yap island revealed that scarcity of resources and perception of food difficulty make people more generous (also see Dirks 1980). Laboratory experiments by Shacter (1959) also indicated that hunger reinforced human gregariousness. On the other hand, studies by Firth (1959) in Tikopia, Turnbull (1972; 1978) among the Ik, Laughlin (1974) for the So, and Bishop (1978) with the Ojibwa Indians showed that people generally keep food for their own private consumption and have the tendency to display what Sahlins (1965: 158) described as crypto-stinginess. Seaton's (1962) laboratory experiment showed much of this same tendency among the people in the Arctic.

How do we reconcile these inconsistencies? Dirks (1980: 23), while not discounting the "individual and cultural differences" as possible sources for the difference, feels that the inconsistencies could also lie in the period when the groups were studied. Caloric deprivation has a strong temporal dimension. The effects of famine both on the physiological and the behavior of the people at the outset of the deprivation period could be different from those in the middle or the later phases. Laughlin and Brady's (1978) diachronic theory of the effects of deprivation claims that "early response to scarcity may be quite distinct from, and indeed opposite to, later ones" (cf. Dirks 1980: 23). The progressive, phasic effects of food scarcity on people's social responses (Lipscomb 1945; Leyton 1946; Keys, et al. 1950; de Castro 1952; Schacter

1959; Sorokin 1975; Jelliffe and Jelliffe 1971) are also supported by the distinctively different psychological reactions with which the starvation phase is associated (Drummond 1950). Dirks (1980: 23) concludes: "This distinctiveness of responses at different points in time and the improbability that all individuals and groups will be affected by food shortage at exactly the same moment and to precisely the same degree may explain much of the diversity reported."

Dirks (1980: 26) proposed that the phasic theory of response to food scarcity can be analytically classified into three stages, each representing a particular intensity of stress on the individual. Employing Selye's (1956) theory of the "general adaptation syndrome" which looks at human response to stress as organized in a triphasic level, Dirks (1980) identified these phases: alarm, resistance, and exhaustion.

The alarm phase constitutes an initial response to the onset of food scarcity. The reaction is generally described as hyperactivation and intensified interaction characterized by increased appetence, including appetite for social interaction (Dirks 1980: 27; de Castro 1952: 66-67) to stabilize the system. Based on experimental data, Schacter (1959) hypothesized that in extreme food difficulty, gregarious tendencies first increase and then decrease. Ethnographic evidence of Schneider (1957) from Yap and of Firth (1959) on Tikopia after hurricanes showed intensified food sharing which was later reduced when supplies ran short. "Lacking any escape, victims of famine at first seek help and give in an altruistic manner" (Dirks 1980: 27). Other studies in highly market-oriented societies, however, show that this may result in panic buying and speculative hoarding for opportunistic windfall profit, and this can escalate into a full-scale famine (Mukerji 1965: 46; Jelliffe and Jelliffe 1971: 573; Woodham-Smith 1962: 61; Bhandari 1974: 78). Among traditional and egalitarian societies such as the Batak, this does not occur. Mass migration to a particular abundant area may be possible but is not available to the Batak.

If relief does not come, the level of response moves on to the second phase. The resistance phase works in just the opposite way to the alarm phase. While the latter involves extensive and intensive generalized reciprocities, the former tends to employ controlling means to minimize increasing energy deficit (Dirks 1980: 28). Conservative measures may be introduced. The "extent of active relations, indexed by food sharing, shrinks considerably. Under continued stress, individuals (may) drop friends and extended kin from food-sharing network, restricting generalized reciprocity to close relatives" (Dirks 1980: 28).

If the energy economizing strategy of the second phase fails, the response moves on to the last resort. In the exhaustion phase the basic foundation of social life collapses. Reciprocity eventually declines until the household no longer functions as a redistributive, protective entity, and individuals begin to fend only for themselves (Dirks 1980: 30). The sick and the aged may even be left to die (Murray, et al. 1976), and young children may be sold (Mallory 1926: 2-3) or cast aside (Turnbull 1972: 121, 134).

It may be hypothesized at this stage that the change in the response from sociocentric to egocentric during the alarm and exhaustion phases of food scarcity is suggestive of two issues in adaptation: survival and cost-benefit. At the initial phase (of food scarcity), a community can still afford to redistribute food among its members but in the later phase when food difficulty intensifies, the whole society can no longer survive if the same response is employed. Thus individual survival takes priority. At this point reproductive dynamics assume great importance. The elderly are then considered dispensable since they already have lost their reproductive power for population maintenance and recovery. The young, too, can be sacrificed for they have not reached their productive period and economic investment in them at this early age is still very low.

Dirks' (1980) scheme is analogous to the series of responses Colson (1979) has reported for the Makah of the Pacific and the Gwemba Tonga of Central Africa. After

> shifting from preferred foods, which can be sold if necessary, to a variety of less-liked foods (sheer bulk becomes more important than quality), people may move on to the employment of conservative techniques of food preparation . . . . When grain is plentiful, women stamp grain in large wooden mortar . . . working companionably together. When grain begins to be scarce women turn to the grindstone, which grinds husk with grain, and so produces the maximum bulk, but a coarser product . . . . When times become still worse, the grindstone is moved indoors, as is all other food preparation, so that only family members are knowledgeable about meals. . . . Before the state of emaciation is reached, however, [they may] begin to trade for food grown in regions with better fortune than they have had . . . . [Livestock may be] slaughtered and trade the meat with those in the village who are still fortunate enough to have grain left . . . . As hunger increased, normal standards of conduct altered. People began to steal from each other . . . . Villages themselves began to disintegrate, as families moved in search of food . . . . Families also shed members. The first to be moved out were usually young children and old people, who were seen

> as a drain on whatever food was still available . . . . The able bodied [may also] leave [to migrate]. (1979: 25-26)

The differential stress between households in the population may be escalated in a highly stratified society where accessibility and control of resources are confined to a particular socioeconomic class. In the 1966-1967 famine in India, the upperclass life style during normal conditions continued as if an emergency did not exist (Central Institute of Research and Training in Public Co-operation 1969: 25), a situation that also took place all over Ireland during the Great Hunger (Woodham-Smith 1962: 165). In Ethiopia, food was hoarded in storage while others were starving in 1973 (Shepard 1975: 60). "Grain dealers, merchants, and landlords sometimes reap hefty profits from such 'class famines'" (Dirks 1980: 25). Among egalitarian societies such as the Batak, this escalating factor (one privileged class making profit from a food shortage) does not exist. One of the factors that can lead to an interhousehold differential of food stress in the population is the changes in the family life-cycle stage which brings changes in household labor supply and household caloric needs as the domestic cycle progresses.

Evidence of cyclical food deprivation among the Batak suggests that its intensity probably has not reached the "exhaustion phase." Among the Ik, relative food abundance is an abnormal condition while extreme food scarcity is a normal event (Turnbull 1978), a situation not yet occurring among the Batak. Their stress period is relatively short since the relief phase (harvest) comes reliably after six months from the onset of scarcity (pre-harvest period). It appears that their levels of response still fall within the "alarm phase" and (gradually move to) the "resistance phase" category. In the period of most extreme food difficulty one can still see the basic social foundation working. The household still serves as the basic unit for food redistribution.

Direct Mode of Interhousehold Food Sharing and Food Scarcity

Basically, interhousehold food sharing among the Batak may take place under two modes. One is what we might call the direct mode. It involves immediately consumable food that needs little if any processing before ingestion. This may consist of cooked or uncooked food that has been collected from their natural environment or their swidden fields, or purchased food. The other mode, indirect, involves the sharing of capital and/or resources from which food can be obtained, and these are made known and extended to others for their use.

The pattern of food-giving and receiving for the seven sample households is apparent in Figure 16. In the months of relative food abundance (HP and PoHP), there is the tendency among the households to give and receive food of approximately equal quantity. The ratio between the amount of food given and received by most of the households clusters around the point of perfect symmetry between amount of food received and given.[1] It should be remembered that this symmetrical

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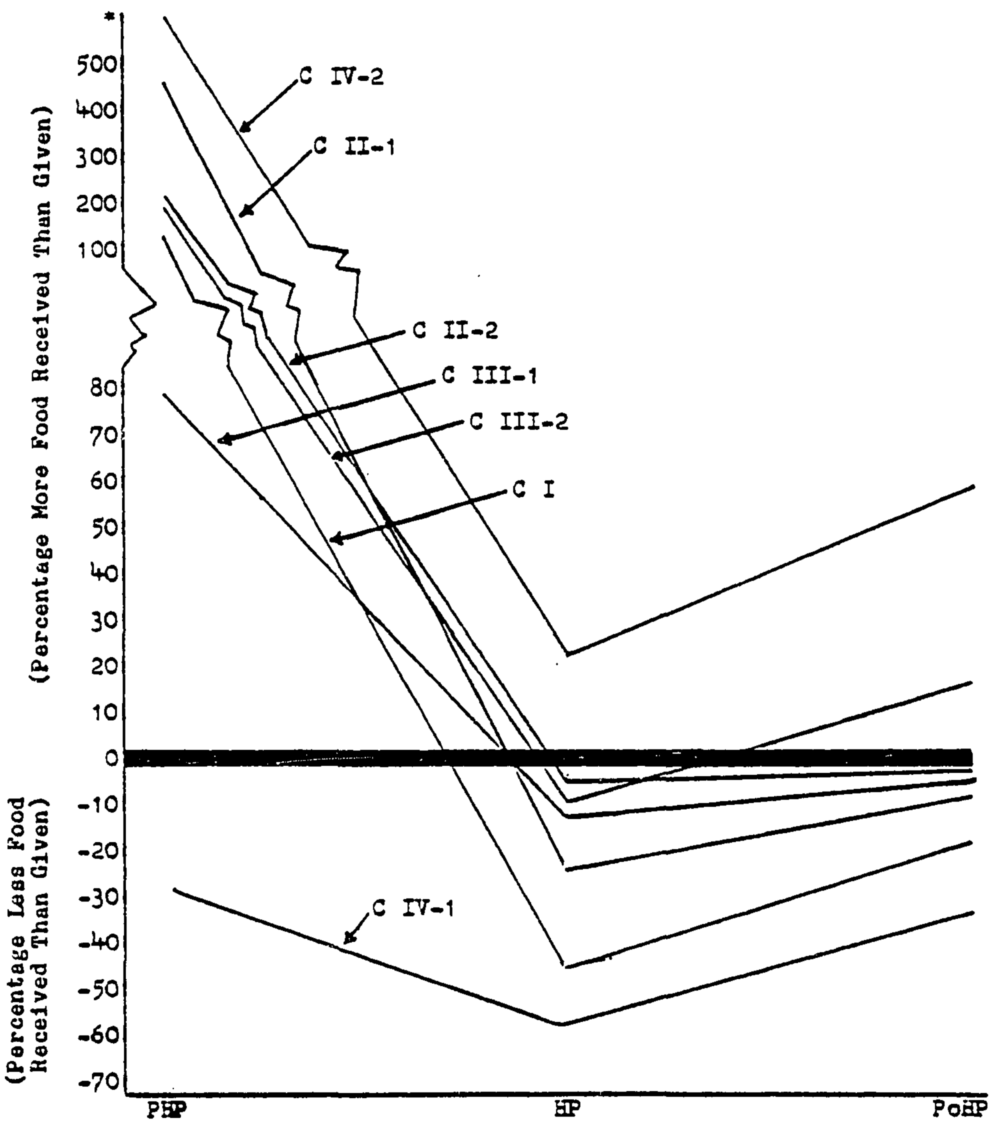
[1]This ratio, which is expressed in a percentage in Figure 16, is computed using the following criterion: $|G - R|$ divided by either G or R whichever is smaller (R is food received and G is food given). If R is smaller, then its quotient is considered as "The Percentage Less Food Received Than Given" and is preceded by a minus sign. If G is smaller and is used as the divisor, then its quotient is considered as the "Percentage More Food Received Than Given" and gets an imaginary plus sign before it.



*Only Received Food, Not Giving.
PHP - Pre-harvest Period. HP - Harvest Period
PoHP - Post-harvest Period
0 Point of Perfect Symmetry Between Amount of Food Received and Given

Figure 16. Food Giving and Receiving Pattern of Seven Sample Households During Three Different Periods.

tendency will not necessarily result in a one-to-one correlation in the real world at any particular point in time. Although these symmetrical tendencies exist, the amount of food given by most households during this period (HP and PoHP) generally exceeds that which is received. An exception to this is, however, demonstrated by two of the sample household cases where one (C IV-2) has been actually receiving more during HP and PoHP. And, the other (C III-2) doing the same during the PoHP. This is explained by the advanced age of the couple in the former and the high dependency ratio of the latter household.

The trend suggests that in the HP, almost all of the households in the village give as generously as they can afford. It appears that the motivation to share food during this time has a strong social overtone. For instance, C IV-2 household which theoretically is no longer expected to give, still gives substantially during this time but proportionately less than it has received by about 20 percent. However, one cannot discount as an economic motivation the amount of food given by the harvesting households to those waiting for their harvest.

Food giving during this period is so diffused and generalized that food received and given by a household comes from, and goes to, practically all sections of the Batak village. During this period, the mean geographic distance between the giver, the receiver, and the EGO households is more than twice the distance of such households during the period of scarcity. The number of households involved is also twice as many as those during the periods of relative scarcity. While the social commitments and loyalties are established, reaffirmed and strengthened, it widens the network of households which incur a debt of gratitude to the giving households. The probability is that the larger your clientele, the greater your chances of getting something at a later date. By giving to a good number of people during this time, the payoff may be delayed but the cumulative amount of food that may be coming from them will really help, especially during times of high food stress. When caloric scarcity comes, a household may already have a sizable number of potential givers, and although some may not be a good payoff, others will turn out to be very helpful. Thus a comment I commonly heard from heads of households during food shortage was that "some of these days, I can get food from my friends."

Although this generosity declines after the harvest period (PoHP), as the curves in Figure 16 show, food giving in most households still exceeds food receipt. However, among households with a high dependency ratio (C III-2), or households with a couple advanced in age (C IV-2), food giving is reduced such that food receipts exceed food giving by around 20 and 60 percent respectively (see Figure 16).

The onset of food scarcity comes during the month of February, considered as the beginning of the pre-harvest period (PHP). During this and the months following, all of the sample households but one receive more than they give. In fact, household C IV-2 no longer gives, it only receives. This suggests that most of the sample households during this time reduce food giving tremendously and receive more than they give. Food giving becomes controlled and limited. The ratio between the amount given and received is now highly asymmetrical. Figure 16 shows that the ratio is now ten or more times as high as during HP and PoHP from the point of perfect symmetry between food received and given. The number of households involved in the transactions with an EGO household is now reduced and consequently limited to close kin and those geographically close to each other.

The pattern of giving and receiving food during periods of availability and scarcity suggests a number of coping mechanisms. In the period of relative abundance, when the utility value of food is still relatively low, the households can afford to be unusually generous. It appears that everybody (as much as he can afford) is "stocking up" on social creditors. Its adaptive implication lies in the establishing of a large number of households sharing (and thereby lowering) the anticipated risk of hunger. Otherwise a household will have to face alone the risk of starvation in the future since it did not foresee this pay-off.

In the months of food scarcity, on the other hand, households can no longer afford, due to its extremely high utility value, to continue generous giving. Reducing the amount and limiting the number of household transactors, among others, is another alternative. Involving a small number of households is, in fact, statistically disadvantageous since the probability of return is less. This risk is, however, overcome by restricting food sharing to a few selected households, mostly close relatives living nearby. Nonetheless, this set-up does not prohibit the social debtors who may be living far away from giving to their former donors when they can afford to. The mean distance from the food-giver households to the EGO household is twice as much as the distance from the food-receiver to the EGO household, during periods of difficulty (see Appendix Table A-14).

By confining the transactions to the few selected households, the risk of non-return is lowered. Any variance in pay-off that may be expected to occur at this time is largely due to the developmental stages of the related households. The variance is therefore expected to cancel itself out in the long run when the households will all have completed their respective cycles (see below).

The decision to share less food with a few selected households during the hard times may account for the almost equal distribution of food (Wiessner 1977: 105). This decision and its effects are not, however, as simple as Wiessner (1977: 104-105) thought them to be. In fact, this system is meaningless unless it is viewed in the context of the kinds of resources involved, the cyclical pattern of scarcity, and the developmental stages of the households. Since these factors do not work singly, one can imagine the number of permutations the Batak have to consider under particular circumstances.

Theoretically, C IV-1 household was expected to be self-sufficient as borne out by the data (see Figure 16), being in the "no-dependent" cycle stage. Its adequate labor supply along with lower caloric needs compared to the other sample households, enabled it to be self-contained. C I household, whose structure is analogous to C IV-1, is, however, not self-sufficient due to its peculiar characteristics.

But where does this extra food received by most of the sample households during the period of scarcity come from? Obviously, C IV-1 must have contributed some but not all. The food received by these six households came from the other households not included in the sample. Eighty percent of the food received by the six households came from the nonsample households and 90 percent of the giving households come from the latter group of households.

Why are these households capable of giving during this period when in fact everybody is under similar stress? It can be explained by their favorable demographic structure caused by their family life-cycle stage. The data on the production level of the seven sample households can be used as an indicator of the food production potential of the non-sample households, given their demographic structure.

Of the fifteen non-sample households, ten have a "0" dependency ratio. All of these households are active in swidden agriculture (unlike our C I sample) with heads younger than that of the C IV-1 household. The size of their swidden fields is as big as C IV-1's and in fact all of them are better off than our sample C IV-1[2] household since they all participate actively in the collection of commercial forest products, a major food buffer during scarcity.

Does one break the norms of egalitarianism by just receiving and not giving, or by receiving more and giving less? Normative prescriptions are always circumstantial. The adaptiveness and flexibility of norms lies in the "if" clauses that are always either implicitly or explicitly attached to these rules. "If these exist, then the following applies . . . ." Another salient point relevant to this question is that in a generalized form of reciprocity, such as that exemplified in

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[2]The husband in C IV-1 household has a "back problem" caused by a bad fall when he was still young. This keeps him from participating in the collection of commercial forest products.

interhousehold food sharing, giving and receiving are never equal[3] at one particular point in time. Since food giving and receiving is a process defined by circumstances, rather than as an end result of the social prescriptions, the social scale may hit the "balance point" only over a long period, assuming that there is such a thing as "social balancing." Assuming that food receiving creates a social obligation to give, the balancing of this particular social debt involves the while lifetime of a household or a person. This becomes very clear when interhousehold food sharing is seen in the context of the domestic developmental cycle.

Family Life-Cycle Stage and Interhousehold Food Sharing

The developmental view of a domestic structure regards a household composition during a particular point-in-time "not as a (permanent) form, but as a transitory state in the development of the household" (Hammel 1978: 142). The process involves a complex set of factors so that "a simple evolutionary scheme that rests on a crude succession of types" (Yanagisako 1979: 172) usually fails to take into account the variation that may exist even in a small population. Existing literature on this issue suggest that the following interacting factors can yield various household types, each of them in turn yields particular characteristics: demographic, ecological, economic, historical, and social.

Age at marriage, life expectancy, and fertility levels, just to mention a few, are some of the demographic processes that have an

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[3]See Sahlins' (1965) differentiation of generalized, balanced, and negative reciprocity.

impact on the composition of households (Yanagisako 1979: 167; Burch 1972; Levy 1965; Wrigley 1969). Citing Sahlins (1972) and Chayanov (1966), Yanagisako (1979: 167) observes:

> . . . where the household is the unit of production, changes in the demographic structure of the households as it moves through the developmental cycle will entail changes in the ratio of consumers to workers. . . . Moreover, in a society where the household is the unit of production, some percentage of the households will not be able to support themselves because of an unfavorable dependency ratio. (Emphasis mine)

The ecological context in understanding peasant household developmental process was suggested by Wolf (1966). One of the works that followed this framework was Collier's (1975) study of the land tenure system of six Mayan communities which concluded that their household organization is linked with the adaptation of the population to the use of local resources. The complexity of the system becomes apparent when he intimated ". . . that an adequate explanation of the relation between family organization and land tenure required an understanding of the region-wide system of interethnic and interclass relationships linking families to hamlet, township, state, and national processes" (Yanagisako 1979: 170; see also Goldschmidt and Kunkel 1971).

In societies where social stratification is marked, interclass variations in the household developmental cycle are apparent (Freedman 1958). Even at the intraclass level, such as that among the farmers in the villages of Yen-liao in Taiwan, for example, Cohen (1976: 239-242) found that landholdings are not the same and these internal differentiations can bring intraclass variation in household development (Mintz 1973; Shanin 1972; 1973; T. Smith 1977; Wheaton 1975). Mintz observes (1973: 3) that "peasantries nowhere form a homogeneous mass of agglomerate, but always and everywhere typified themselves by internal differentiation along many lines." This suggests that even among egalitarian societies intravillage variation between households may be encountered, brought about by a host of factors.

The economic factors which stem from the labor needs for production (Pasternack, Ember and Ember 1976), defensive needs, care of children, taxation, and conscription practices of the state (Yanagisako 1979: 169; Hammel 1972), inheritance (Freedman 1970; 1958; Ahern 1973) and control of property (Goody 1973; 1976) can affect household formation and timing of structural changes.

The historical factor stems from the recognition that the timing of household formation could mean a different ordering of changes in the household structure. Yanagisako (1979: 169) observes that the "more recently formed households are embarking on a different sequence than older households." The circumstances prevailing at the time a household is formed can lead that household to a different morphogenic arrangement.

Two things are apparent in the broad scenario I have just outlined. First, a monolithic succession of stages of households' development even in a small population will miss the intricacies of domestic developmental processes. This can only be understood adequately if seen as a system of process of socioeconomic relationships starting from a domestic level and ramifying outward to include other households. Second, the "shape of a domestic unit" appears to be universally temporary eventually developing into another until its final extinction. Meanwhile a new unit is normally formed replacing the departing one. At one stage a household will have higher production while its needs are lower and in another the opposite may prevail (Sahlins 1972; Chayanov 1966).

The idea of a long-term, give-and-take balance in a generalized reciprocity is illustrated in this context. Wiessner (1977: 99-103) remarked that this reciprocity depends on the ability of the households to fill each other's needs. However, she believes that a balance between giving and receiving is never theoretically achieved. It is precisely in the imbalance that tips the scale alternately between transacting households to keep the system going. For households that are no longer able to give in kind, "in the case of very old people," Wiessner (1977: 102) said they render in services to the younger ones like arranging marriages, mediating conflict, and curing. The problem is that only one or two people in the community usually can render these services. I argue that it is not only the services that the old render to the young that legitimize their not giving anything in kind, but also the developmental stage of the household. While Wiessner (1977) is realistic about the cyclical fluctuation of food supply, she failed to recognize that changes in the developmental cycle of a household can in turn bring changes in the household's food production and needs. She was able to see the developmental cycle of households in the context of the evolution of <u>hxaro</u> (sharing) partners. Yet if hxaro, as a form of generalized reciprocity, is predicated by the ability of the households to fill each other's food need during different time periods (Wiessner 1977: 99-103), then changes in household's food production and its needs are important as a theoretical and practical issue to consider. At a stage when a household is experiencing caloric scarcity, the household can be expected to receive most of the time, if not always. While it is the social privilege of the "have not" households, using Sahlins' (1965) term, to be the receiver most of the time, it is similarly the social obligation of the "haves" households, by virtue of their economically favorable life-cycle stage, to give. In Western societies, the pressure of the extreme economic squeeze may be reduced by working extra hours through moonlighting (see Welinsky 1963) or by the help of the social security systems. These are options not available, however, to the hunters/gatherers or marginal agriculturalists, such as the Batak. Interhousehold food sharing is the likely recourse for them. It is a lifelong process which eventually leaves some households in some societies, at the end, neither debtor nor lender. At this point, social balancing may be theoretically expected.

Based on my Batak data and the existing literature, a hypothesis concerning the relationship between food production and sharing pattern by a household from its formation to its dissolution can be formulated schematically (Figure 17).

Other Factors Affecting the Direct Mode of Food Sharing

The intensity and structure of a direct mode of interhousehold food sharing may be modified by a number of factors such as the following: manner of sharing food, types of food shared, kinship, and geographical distance between households.

Manner of Sharing Food: Food may be offered to somebody who happens to visit a household. Generally the food offered involves a minimum amount, just enough for the visitor. The process is unplanned and highly casual. A rather planned and more formal way of inviting people to eat in one's household takes place during feasts. When food asking is planned, however, the contact between households, especially between distant kin, tends to be formal although the request is only hinted at:

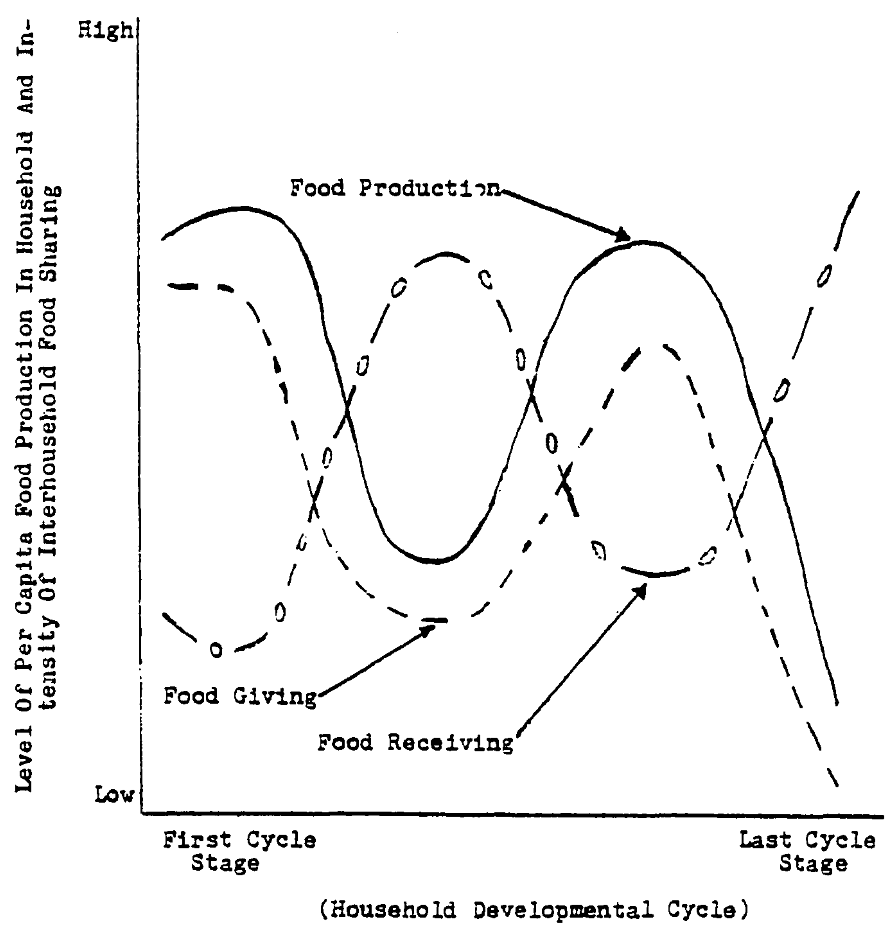


Figure 17. Theoretical Relationship Between Food Production Level, Interhousehold Food Sharing Intensity and Family Life-cycle Stage.

"Umay ko sipút na. Dagwa' maka-én anak ko!" (My rice is all gone. My child has nothing to eat!) When this happens, a food item is given. Unlike the first case where the person is drawn into the household to join in a meal, in the second, it is the food material per se that is sent out.

Food may be shared therefore with other households in two ways: one is to send the food resource item itself to another household in the village; and, the other is to bring a person or persons into a household where food is served.

When a food item is sent from one household to another, the amount involved is generally substantial. This is expected since when a household sends food to another, the number of people in the receiving household is considered. On the other hand, when a person takes a meal in another household, the host offers food just enough for this guest.

During the harvest and the post-harvest periods, the proportion of food sent to other households sharply increases, by almost 800 percent. When people are asked to join meals, the increase is only by 200 percent. In the period of food scarcity, there was a decline in the first by more than 80 percent, but an incrase of around 120 percent was observed for the second manner of sharing food. This suggests that those households capable of giving food during the period of scarcity minimize sending food items to other households. Nonetheless, the act of giving food is continued even at a low level by inviting individuals from other households to join for a meal with them. For instance, it is not unusual for grandparents (like the couple in C IV-1 household) to ask their married children to send the grandchildren to their house to eat with them during the months of scarcity. In the evenings, the grandchildren are sent home.

The increasing niche width and the more diversified procurement mix during the months of food scarcity bring most of the working individuals to the different biotopes. The chances of running into some groups of Batak taking time out to eat while collecting forest products are high. When one runs into these men, he is surely invited to eat with them.

Moving people to other households to join in a meal during the months of food difficulty may constitute a subtle strategy of preserving the social system. By transferring calories in this manner, potential food givers widen the food sharing network, albeit in token form. While the household is assured of the immediate satisfaction of its own limited food, it has also preserved the social cooperation expected at that particular point in time. Some of these gifts may turn out to be good investments in the long run, especially when a household reaches its final life-cycle stage.

Types of Food Shared: Appendix Table A-12 empirically supports the Batak's claim that food produced using cash is very costly, hence should be shared sparingly. This type of product has the lowest food sharing index in contrast to hunted and fished foods. The latter type, which is highly perishable, has to be disposed of before it becomes spoiled. In this way sharing is more economical, since the producer is socially storing in return for a payoff when such food is of high value. Also, this may be nutritionally adaptive. Sharing protein-rich food when it is available in large amounts may prevent wastage by enhancing effective physiological assimilation in contrast to the inefficient metabolism which results when large amounts of protein food are consumed at one time (McArthur 1974: 114). It is believed that protein consumption above bodily needs will only be catabolized instead of being assimilated into the body system (Maynard and Loosli 1979: 118). Since, among the Batak, protein-rich food is scarcer than carbohydrate food, it is a limiting factor. To enable the population to have a fairly regular supply of protein for bodily growth and repair, frequent sharing of protein-rich food although limited in quantity, becomes imperative.

Purchased foods are generally shared through the process of sharing meals in one's own household with other people. This is in keeping without observation that such items are generally meant for private consumption, and hence should be shared with restraint. Sharing of these items would only create a dent in the volume of the food supply for that particular meal but would not necessarily diminish the volume of the entire purchased caloric supply. The risk of uncertain future return for a highly valuable resource, such as purchased foods, is anticipated and should be handled effectively. So far, there is no attempt to undermine the social system. In fact much of their behavior demonstrates their concern with the preservation of the system through subtle strategies.

Kinship: Kin proximity among households also affects the structure and content of food sharing. In an egalitarian society such as the Batak's, social consciousness is still channeled on the basis of kin relations. The core concern starts with members of the nuclear family. This concern gradually spreads out like concentric cirlces with a ripple effect (see Figure 10).

Figure 10 (see Chapter V) illustrates the distance of kin from EGO. These distances are mentally categorized and concretely reflected when EGO behaves in relation to these individuals as well as when individuals relate to EGO. There is a declining intensity of socioeconomic intercourse between EGO's household and those more distant in the kin network. By measuring the intensity of this intercourse on the basis of the amount of calories that EGO's household gives out and the calories it receives from donor households, a pattern of declining caloric quantity is demonstrated (see Appendix Table A-13).

To the Batak, his immediate family is his prime concern, but he does not overlook the welfare of the community without which his own family's very existence would be endangered. The system suggests, in economic terms, that food handling among close kin groups minimizes the uncertainty of return in time of high utility value of food such as the months of deprivation. In evolutionary terms, this demonstrates the principle of exclusive selection (or fitness) for a particular subgroup in contrast to an inclusive selection (or fitness) of the total group (Hamilton 1975: 135-136; 1971: 82). Many times I heard a son say to his father:[4] "Father, please give me food. When you do not have, and I have, I will give you!"

The way EGO relates with these categories of kin, however, varies as the level of food availability changes from scarcity to abundance. In the months of food scarcity, around 80 percent of the food involved

[4]As a general rule, soliciting food is only hinted. But when contracting parties are closely related by consanguinity such as between father and son, then the asking can be made more direct.

in sharing is focused at Levels 1 and 2 while a more even pattern of levels of kin involvement is observed during periods of abundance.

Geographical Distance: There is a correlation between kinship and the clustering of households. A cluster of households largely consists of the first two levels of kin. Consequently, one can appreciate the direct relationship between geographical distance of households and the intensity of food sharing. The farther apart the households, the more energy is spent in moving the food or people between them. Thus confining food giving to geographically accessible households, especially during caloric scarcity, would be more profitable in energy terms. In fact, there seems to be a kind of threshold beyond which close kin preference for food sharing no longer works. In July to September, hunting is profitable. During these months in 1980, one prolific hunter was giving meat to his brothers, sisters, uncles and aunts, and in-laws who were living at a distance of a 30-minute walk. The hunter had another brother and sister living in another village, an eight-hour walk from my study area, but not a single slice of meat was given to them. I asked him, "Why?" He answered: "Very far!"

Appendix Table A-13 shows the range of distance between ego's household and the food donor and recipient households. It indicates that food giving and receiving is greatest among households located less than one kilometer apart, and least among those situated beyond two or more kilometers. This tendency is more apparent when households restrict transactions of this nature to households located one-half kilometer apart during the period of relative scarcity (see Appendix Table A-14).

Indirect Mode of Interhousehold Food Sharing

Unlike the direct mode, the indirect mode brings the receiver of capital resources to the area or site where food is produced. In the sharing of tools, swidden fields, rights to collect resin from tapped resin trees, labor, and information, the recipient invests his own energy to obtain food from such resources. This gives him the freedom to determine the amount of calories he desires. This suggests that some of the factors affecting the direct mode do not necessarily affect the indirect mode, except those which involve kinship and geographical distance between transacting households.

There are two types of resources involved in the indirect mode of interhousehold food sharing: the material and the non-material (information) resources.

The sharing of the material resources usually occurs in a cyclical fashion to coincide with food-getting activities, seasonality, and opportunities. For instance, the snaring of swidden plots for root crop production (dab-dab) takes place after the harvest season. Tools may be shared when the owner does not use them, while labor may be shared when the swidden cycle demands intense labor. Let us follow one particular resource to demonstrate this point.

Most Batak households, except those of the elderly, have enough almaciga trees (Agathis philippinensis) in the zone of 1,000-meter and above elevation for each to produce one adequate man-load[5] of wild resin (Manila copal) every collecting trip. Whoever makes the first

[5]Between 25 to 35 kilograms depending on the size and age of a person.

tapping of the tree, under usufructuary principles, owns it. Nobody dares to tap the resin from it unless the owner gives him permission. Normally the resin is collected one week after the tapping.

Occasionally, a household may not be able to collect from its trees for some reason. Meanwhile, a household, whose resin trees are drained, and is badly in need of cash, for instance, to pay a cereal debt, may collect from another household's trees with permission.

From May, 1980 to April, 1981, I recorded all Manila copal collected under these circumstances. The number of households, trips, and total weight of Manila copal showed a trend which logically follows the pattern of intensity of collecting commercial forest products. The most intense sharing of the use of almaciga falls in the months when most of the households have reduced the collecting of commercial forest products. This suggests that those households which are badly in need of the resource and which have the time and the manpower to do the collecting synchronize their solicitation with the period when almaciga trees are free from their owners' use.

CHAPTER VIII

INFORMATION SHARING: COMMUNICATION SUBSYSTEM

A village, as a system, "has a given productive potential at any point in time, and its external resources (inputs) give it the opportunity to realize that potential" (Kincaid 1976: 93-94). Aside from the resources are processes of "psychological and social events that are interrelated in a web of communication and involve continual decision making under conditions of uncertainty" (Buckley 1967: 72). In its entirety, it can be viewed as a complex adaptive system. However, any real system, like a village, "has limitation on what it can do with its resources--material, energy, technology, and information" (Kincaid 1976: 94).

There are two ways of looking at a village system. One is that the village consists of groups which are task-oriented. Interdependence is therefore important in the process of attaining a common goal. The other is that it consists of an aggregate of individuals, each independently pursuing a solution to a problem and then pooling the results (Kowitz and Knutson 1980: 4). The Batak's own village system is an interphase to these two types. At a certain point in time, the first condition is demonstrated; at other times, the second. In either case the process of decision making rests on "the exchange and processing of information among groups' members" (Kowitz and Knutson 1980: 5). For efficient collective or individual activities, a sector of the group has to collect, select, interpret, and disseminate information (Rahim 1976: 146). In a population where information is informally and personally transmitted, each individual has the responsibility to serve as a vital part of the communication system. Implicitly, each individual becomes a member of the network and links established by patterned communication flows (Rogers and Agarwala-Rogers 1976; Lauman 1973). In this network, an exchange of information such as facts, opinion, or advice (Kowitz and Knutson 1980: 8) takes place.

Information exchange carries both symbolic and material dimensions. Shared meaning, aspirations, role realization and other symbolic aspects of the social life are activated and interpreted in the process of sharing information. On the other hand, economic resources may be exploited and goods may be distributed as information is shared. Information sharing is a social process that provides for both the symbolic and the material needs of the population.

Information Flow Analysis

In systems analysis, information has two components, the "symbol or signal" (see Hartley 1928; Shannon and Weaver 1949) and the "meaning." Meaning is the significance of a symbol or signal to a system which processes it (J. Miller 1965: 193). This study views information in the context of these two components.

Information flow analysis has been largely focused on the process of maximizing energy returns (Reynolds and Zeigler 1979; Reynolds 1978; Charnov, Orians and Hyatt 1976; Schoener 1971; J. Wiens 1976). Such focus has, however, been considered inappropriate for low-energy using societies like those of the hunters and gatherers (see Reynolds and Zeigler 1979: 405). Furthermore, these studies have reduced the importance of information flow by making it as a peripheral variable in their analysis. "Most theories have no explicit role for information sharing and processing as a variable. Whether one looks to geography, ecology, or economics, the role of information sharing as a dynamic social process is hidden behind the familiar visage of the rational 'economic man'" (Moore 1981: 194). At worst, these analyses frequently concentrate on the flow of matter and energy while neglecting the flow of information (Flannery 1972).

There is another way of looking at information sharing besides being a maximizing mechanism in the use of resources on a short-term basis. It should also be viewed as an adaptive strategy in handling the problem of declining resources characterized by their seasonal fluctuation. As an adaptive strategy, it may help a population to preserve its resources for a sustained long-term use (see below). Such mechanism is also highly adaptive for marginal agriculturalists (with still highly generalized subsistence practices) who are rapidly becoming sedentary.

The adaptive implications of information sharing have still remained implicit in many "maximizing" models of researches among the lower and higher forms of animals. Studies on lower species predation on "depressed resources" (see Charnov, Orians and Hyatt 1976; 247; Brown and Orians 1970; Stokes 1974) suggest that the monopoly of information (about availability of resources) to "territorial owners" prevents unnecessary aggression between potential competing predators. In the absence of speech, such information is shared by using cues or signals among its members. J. Wiens (1976: 99) in his study on population responses to patchy resources noted that "individuals that have been unsuccessful in finding resource concentration may follow successful individuals out of the roost or colony on foraging trips to good feeding areas, and successful individuals may 'advertise' their success by behavioral differences from unsuccessful individuals, and thus attract followers" (also see Ward 1965; Zahavi 1971; Ward and Zahavi 1973). In the analysis of cultural evolution, Flannery (1972: 411-412) observes that the collection and distribution of knowledge concerning resources availability has a high survival importance (also see Steward 1955, Chapter 6). Such importance is articulated when some egalitarian societies link information sharing with elaborate rituals (see Rappaport 1968).

Constant supply of information serves as a basis in the daily decision-making process for choosing with a minimum amount of uncertainty a specific activity over others (Demski 1972: 4). Such a process has a survival relevance especially when it deals with the utilization of increasingly scarce resources.

The thesis is that sharing information about resources, as an adaptive mechanism, is related to two factors, ecology and mobility. When resources are unevenly distributed in time and space, information sharing is important. Its importance increases as the people become less mobile subsequently making forest trips less frequent. The loss of information by individual discovery may be compensated for by sharing information with others. This has implications both in the preservation of resources and the people's survival.

Information sharing leads to interhousehold food sharing. Conceptually, when marginal agriculturalists share information concerning resources in their natural habitat, food is potentially shared. This is expected since the link between obtainable food and information about these resources is very close.

Structure of Food Base and Optimal Food Utilization

In the analysis of optimal resource utilization, two aspects have to be considered, the feeding population and the resources fed on. The feeders can be of two types, the "time minimizers" and the "energy maximizers" (Schoener 1971: 376). The first minimizes time requirement in the production of energy like the animals that live in colonies with very limited feeding range. The second minimizes energy expenditure in the production such as the "ambush type" predators which stalk their prey by strategically hiding themselves at prey routes and attack at the right moment. Even at the lower level, however, this dichotomy is still inadequate since there are animals that demonstrate both types. This problem is all the more apparent at the higher level since man shifts from one type to another depending on the circumstances. Among the lower forms of animals, behavior may be largely determined by the genetic code. Among the higher forms, the wide range of learning experience and historical background largely affect their feeding behavior patterns. For instance among the Batak, during the period of plenty, concentrating on the most abundant resource with the shortest production time is the appropriate strategy. In the months of scarcity, energy cost is minimized by limiting unnecessary energy expenditure. Feeding behavior becomes highly opportunistic and generalized. A wider range of niches is exploited and to shorten the searching efforts in this widening niche width, sharing information on resource condition is intensified.

Distribution of resource supply may vary spatially and temporally. They can be highly concentrated and specialized (such as in agriculture), widely dispersed, patchy and generalized, highly seasonal but either concentrated or highly patchy, constant but either patchy or concentrated. Further, resources may dwindle by sheer exploitation. Whichever is the resource structure, the feeding strategy of the population is affected.

A population has its own set of policies concerning exploitation of resources in their environment (Flannery 1972). Their different feeding strategies are an articulation of these policies. "Thus changes in resource exploitation policies over time are related to corresponding changes in resource exploitation strategies" (Reynolds and Zeigler 1979: 406). Reynolds and Zeigler (1979: 407) conclude that these changes are "strongly limited by the information gathering of its individual members and not by the number of individuals in the group" (see the concept of population pressure on resources (PPR) by Boserup 1965). Constructing the model of the evolution of hunter-gatherer decision-making systems, R. Reynolds (1978: 31) concluded that "in situations where language facilitates the pooling of information between individuals within a hunger-gatherer group, the group minimally need only to pool information with one central decision maker" in order to maximally utilize the resources in the environment. This has a strong parallelism to a situation among highly socialized lower primates such as the hamadryas baboon. Kummer (1971b: 62) observes that:

> To obtain the ideal design of the route, the slightly differing information of all members would have to be pooled and evaluated . . . . As already mentioned, all a [lower] primate can do to inform the departing troop of a profitable location is to indicate, by the direction of his glances and shifts, the direction

which he intends to take, and possibly the strength of his motivation to go there.

The feeding strategy with respect to specific spatial and temporal distribution of resources has been associated, among others, with the following factors:

a. The ability of each member to collect and process information about the resource distribution;

b. the extent to which information is shared among members;

c. the specific sets of decisions available for each member to make; and

d. the way in which the individual decisions are integrated to produce a group decision. (Reynolds and Zeigler 1979: 406)

In societies where there is no decision-making hierarchy, like that of the Batak, decision making is strictly limited by the individual's abilities to gather information (also see Reynolds and Zeigler 1979: 417). For resources that are widely scattered, the amount of collected resources depends on at least four conditions:

1. Variability in yield from one year to another

2. Variation in distribution of plant and animal resources over time.

3. The ability of the group to identify and exploit maximum concentrations of existing resources. (Reynolds and Ziegler 1979: 417)

4. The availability of labor in the household.

Among egalitarian populations dealing with an extremely large geographical area, the third factor just cited is problematic. Reynolds and Zeigler (1979: 417) indicate that there is a threshold area beyond which individualized information gathering is impossible. Such a problem may be minimized by the following:

> First, it could alter the distribution of available plant resources by means of agriculture, guaranteeing that certain plants would be found in predictable areas. Second, . . . , it could remove the constraint of maximum area by adding a central decision maker, that is, creating a hierarchy in the decision-making apparatus. These alternatives need not be mutually exclusive and might both be employed by a group. . . . For example, the Indians of the Pacific Northwest Coast of the United States and Canada developed a ranked society with a decision-making hierarchy but not agriculture (Drucker 1955). The Indians of Mesoamerica, on the other hand, developed agriculture thousands of years before hereditary ranking (Flannery 1972; 1973). We can now suggest that neither phenomenon is necessarily the result of . . . population growth, but rather a solution to the search strategies and communication policies . . . (Reynolds and Zeigler 1979: 417)

Reynolds and Zeigler's (1979) last two points are intriguing but they appear to have missed another system, i.e., systematic information sharing. Splitting a population into small residential units, widely distributed in a large territory (where each household takes responsibility to monitor resource conditions in its area and to share that information with others from other residential sections) creates an effective information network without having a central decision maker. Although decisions may be carried out on an individual basis, this is based on accurate information constantly flowing among its members. Information sharing, as an adaptive mechanism, may be complemented with interhousehold food sharing practices. The latter is important to households with insufficient labor (thus for lack of manpower, receipt of information on resources is deemed useless). Until the time of study, the Batak have remained egalitarian, without a headman as the central decision maker. Although they already have adopted swidden agriculture, they still have retained their generalized subsistence strategy. Whether the geographical area they are dealing with is smaller than what Reynolds and Zeigler (1979) have considered as the threshold size, is difficult to ascertain since they themselves have not identified how large this threshold area is. Its size has still remained a theoretical construct than an empirical fact.

One distinguishing feature that characterizes the food base of marginal agriculturalists in a tropical forest ecosystem is its widely diffused location. The food resources in the five food zones of the Batak vary in their level of perishability, degree of dependability, and level of energy input to produce them. For wild plant or animal foods, the specific time and place of availability are uncertain, unlike the situation for domesticated crops. Although the Batak have a general idea as to the cycle of availability of the first type of food resources, specific information concerning their particular location is not always at hand.

The Batak may also know generally when lowland Christians need labor, but everybody wants to have specific information about which particular household needs labor on what specific date. The efficiency of their food procurement system depends on the ability of the population to integrate various food production activities.

For highly dispersed resources, in contrast to the highly localized ones found in advanced intensive agriculture, optimal utilization of resources is a survival issue. Optimal food production may not necessarily mean the maximum quantity of food produced as commonly assumed in the West. For the non-Western mind it may only involve the process of reducing to the lowest level the risk of not being able to utilize the resource at its most appropriate time (Johnson 1971b: 137).

To satisfactorily exploit their resources, it is not enough for the Batak to have ownership right and access to a sufficient level of energy input. They must also have precise information concerning the specific location of a particular food resource. While intensifying efforts in the search for these resources does not necessarily lessen the risk of loss, the increase in energy input is contrary to the principle of "Least Effort" (Zipf 1949) which assumes that man opts for a particular food procurement system with the least amount of energy demand. If other factors are constant, the population may not favor technological intensification (Boserup 1965). Energetically, information sharing is most economical. Once a particular resource site is known, labor is deployed without incurring any energy cost for the searching effort. If there is systematic information flow, then food production can be coordinated with minimum energy cost.

Hunters and collectors who frequent the forest are the natural carriers of such information. They usually know the current condition of food resources in different areas. Batak households plan their food production moves based on this information. Ethnographic evidence from hunters and collectors (Lee 1979) and pastoral nomads (Barth 1965) indicate that information exchange is a major part of the group's nightly talk. Among Batak adults, around 67 percent of their conversation time involves information on food availability and labor opportunity in the area. Strategies for individual moves and activities for the next day are usually based on the information obtained the night before.

Among marginal agriculturalists like the Batak, whose residential pattern is becoming more sedentary, specific knowledge about food resources in the wild is becoming a limited resource. Nomadism keeps people in constant contact with the forest resources. The decline in nomadism brings the decline in the people's affinity with their own forest resources.

Information Sharing: An Ecological Perspective

The ecology of information sharing may be understood in the context of the Batak's two subsystems, the natural environment and the population.

Natural Environment: The natural environment consists of the biotic and the abiotic elements in their ecological zones. Their food supply can be obtained from the plant and animal resources found in the forest, their swidden fields, and from other food-getting opportunities in other biotopes. The resources in the forest will be self-sustaining if their natural structure is not irreversibly altered. Instead of simplifying their resource diversity, the Batak sustain a technology adapted to resource diversity. By coordinating various food production activities the Batak are able to utilize resources in various areas of the forest. Coordination, as we have mentioned earlier, depends on the specific knowledge the population has during a particular time concerning food availability in a given locality. This knowledge can be obtained by taking frequent trips to the forest or by receiving information from others.

When information on various food resources becomes limited, the population's food production activities will be limited, and most likely they will be focused on the few resources about which they have the information. An inverse relation between the amount and variety of information and the degree of concentration of resource use may therefore theoretically be expected. Ecologically, having limited information may lead to an "over-kill" or "over-utilization" of a particular resource which is detrimental to the resource's natural regeneration process. To prevent such energy drain, collecting or gathering activities should be diffused and diverse.

Population: Among other factors, a population's survival depends on the quantity and quality of food in their diet. For a population whose nourishment is taken directly from their natural environment rather than from the market, diversified food collection is necessary to yield nutritional variety and to improve food quality (see K. Dewey 1981). In this manner the volume of food may likewise be increased. Evidence shows that when food difficulty is increasingly felt by the population, information sharing about food resources is intensified (see Figure 18). It is one way of bringing people to various resources and resources to people during food stress. The collective cumulation from these resrouces may lead to an optimum level in the absolute amount of food produced during a period of food scarcity.

Information sharing is therefore two-pronged. While it may help to preserve the resources from being over-exploited, it may keep the population from absolute starvation.

Structure of Information Sharing

Marginal agriculturalists need information to pursue appropriate economic behavior. In societies where information is not commercialized, information transfers hands in a more direct and immediate fashion. The information chain is short.

Depending upon the immediacy of response to information shared, information sharing can be divided into two categories: one involves "calling out" for immediate response; and the other, information transfer for delayed response.

Calling Out: When one or two individuals among the primates such as the chimpanzees chance on a food resource, they call out or signal to the group (Reynolds and Reynolds 1965: 414). The food source is shared with the group by immediately bringing the consumers to the food site. This process of signaling results in an immediate response--moving the users to the resource. For human beings such as the Batak, this may simply involve dispatching labor from the household to the collecting site.

Calling out is essentially employed when it involves highly perishable food resources such as mushrooms or ripe wild fruits which demands immediate response. In this case once the "call out" is made, the recipients immediately go to collect. Households which do not have personnel available to do the collecting may later get their share from those who have.

For example, in the early morning of 29 July 1980, Mananawon went to a nearby secondary growth forest with her twelve-year-old daughter, Imay. Fifteen minutes later, her daughter was shouting and running toward the house of her uncle. "I saw plenty of mushrooms. Bring your basket." Then the daughter went back to the site and met her cousin, Armando, on the way. She told him about it. Armando went with her. In ten minutes, four persons collected all the mushrooms on the site, each taking home approximately two kilograms. When Mananawon reached home, she gave around 500 grams to Tadungan, her daughter-in-law living in a nearby hut, who could not go with them since she has an infant.

Information for Delayed Response: For resources that demand delayed response, such as wage-labor opportunity, information is disseminated to other individuals or households during field encounters, household visitation, and nightly chats. Information of this nature has to be passed on early to prepare the recipients and to let them evaluate their own time, labor capability and needs. The planning and deliberation takes into account the total picture of their food production capacities and household needs. A case will clarify this.

On 5 May 1980, Tuyak left the house at 10:15 in the morning to sell his 30-kilogram almaciga in the lowland market. Three hours later he came home bringing two kilograms of rice cereal, 250 grams of brown sugar and two sticks of rolled chewing tobacco. His brother-in-law with his wife, his son-in-law, and his married son were waiting for him. Everybody took a bite of his chewing tobacco. While the whole group was busy masticating betel nut and leaf, lime and tobacco, the brother-in-law asked: "When does Pedro need help to clear his field?"

Tuyak replied: "Three days from today. Are you coming?"

"I am planning to collect almaciga but I will see," his brother-in-law answered.

Meanwhile his son asked: "How many persons does he need?

"He needs at least ten. Did you go to Arorog yesterday?" Tuyak quickly asked after answering.

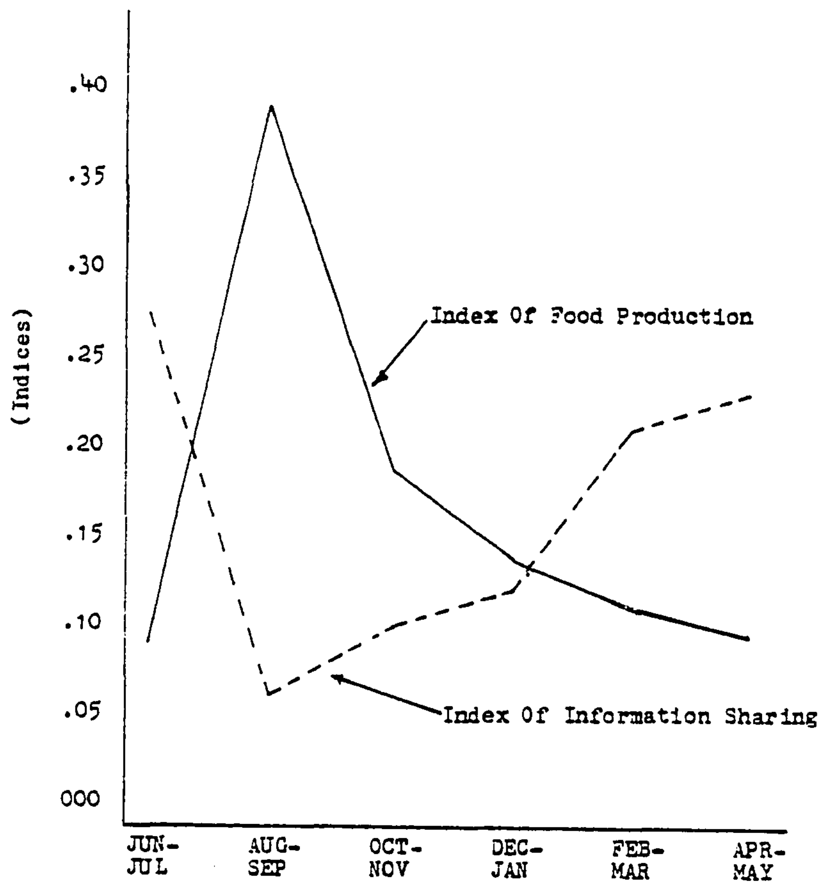
His son replied, "No." and countered, "Why?"

Tuyak anxiously answered. "I just wanted to know whether the fruits of that tree we saw last week are already ripe."

Information Sharing and Food Scarcity

My hypothesis is this: If interhousehold food sharing is used as a mechanism for coping with cyclical food stress, and if information sharing is an indirect form of sharing food, then there must be a correlation between the intensity of information sharing and changing food supply level.

Figure 18 shows that in the months when household caloric production increases, the intensity of information sharing, as measured by the mean number of man-hours spent, decreases. Conversely, as food production declines, the intensity of information sharing increases. In the extreme case of the Ik (Turnbull 1972), I have argued that the intensity of food scarcity among the Batak is not as severe as that of the Ik. The response level (to food scarcity) of the Batak has not reached the exhaustion phase yet, in contrast to what apparently happened among the Ik. As the household's food production starts to fall in the months of December and January, information sharing starts to rise reaching its peak in the months of June and July when household food production is at its lowest. The latter period shortly precedes the start of the harvest season. It is during the months of food scarcity when the niche width is at its widest (see Chapter VI) indicating a highly diverse use of biotopes, thus the demand for information is at its highest. During the harvest period, information sharing declines to its lowest level. Again we witnessed earlier that resource use during the harvest months is confined to their swidden fields



Note: Information sharing index is computed as the ratio between the man-hours spent per week by the seven sample households and the total man-hours spent for all weeks considered. Food production index is computed as the ratio between the weekly caloric production of the seven sample households and the total caloric production for all weeks considered. All the data were collected on a bi-monthly basis.

Figure 18. Curves of Food Production and Information Sharing Indices on a Bi-Monthly Basis for Twelve Months.

yielding a very narrow niche width (see Chapter VI). Consequently, information sharing is not essential during this period. In the succeeding months, food production begins to fall while niche width starts to widen and the need for information sharing begins to rise.

Other Factors Affecting Information Sharing

Unlike sharing food per se, the sharing of information is not necessarily affected directly by most of the factors cited in the first type of sharing. Only two factors, kinship and geographical distance between households, appear to affect the readiness between individuals to share information of a highly limited and readily collectible wild food. Otherwise information sharing is not restricted by these factors. The difference between sharing food per se and information is in their cost-benefit ratios. In the first, a food giver spends his own energy in its procurement while the information provider merely passes the information. When the information concerns a highly limited resource, it should be limited to geographically close kin reducing the collector-resource ratio to maintain a higher per capita yield.

When dealing with other ethnic groups, sharing information involving resources right in their "own territory" becomes highly discriminating. Since other ethnic groups are not barred from utilizing these resources, information concerning these are generally withheld from other groups--a way of minimizing interethnic competition. Functionally, it serves as a "gatekeeping" device (Fisher 1980: 83). Nevertheless, such information is not necessarily kept from a few selected outsiders who have developed special relationships (such as

Plate XXI. One of the More Formal Scenes of Information Sharing.

sandugo or compadrazgo) with a few Batak. In so doing a Batak expands his own resource base by having access to outside resources via these special ties.

Information sharing is not only a medium for social interaction but also an economic vehicle for mobilizing food resources. It is a tool by which marginal agriculturalists are able to coordinate their multiple subsistence activities dealing with cyclical and diverse resources. It is important for human survival. Cultural systems not only function through flows of matter and energy, but also of information (J. Miller 1965; Flannery 1972; Adams 1975; Moore 1981). Information gathering, processing, storage, and analysis are essential in the management of resources. And, as societies get more complex, information management becomes more elaborate. Flannery (1972: 411-412) says:

Thus, one of the main trends in the evolution of bands into tribes, chiefdoms, and states must be a gradual increase in capacity of information processing, storage, and analysis.

Among bands, much of the data handling is done by informal headmen, who collect and distribute knowledge about which groves of edible nuts have been thoroughly harvested, which canyons currently have high concentrations of game, and so on (Steward 1955, Chapter 6; Richard Lee, personal communication). These headmen support themselves taking no "overhead" from society; but the number of bits of information they can process is limited, and serves probably no more than 100 persons at any time. With agriculture comes a need to control not only data on wild foods, but the allocation of land, timing of planting and harvest, and collaboration on land clearance; perhaps most importantly, disparities in harvests and surpluses resulting from differential fertility must be regulated for the overall good of the group. Among egalitarian tribes and even in some chiefdoms, elaborate ritual programs detect such disparities and ceremonially circulate harvests, resources, obligations, and rights to land among members of society (Rappaport 1968). These rituals are costly (overhead is still overhead, even when it is ritually committed to gods or deceased ancestors), yet they process . . . data and perform . . . regulation . . . .

CHAPTER IX

THE ECOLOGY OF FOOD MANAGEMENT:

SYNTHESIS AND CONCLUSION

> Coping for survival includes, most obviously, obtaining adequate food. Feeding behavior has long been a focus both of biological ecology and, . . . of anthropology . . . . If human behavior is to be viewed in systemic terms, then subsistence activities provide one point at which to enter the system of study. (Jochim 1981: 64)

A food management system is a complex set of strategies employed in the procurement, distribution. and consumption of food Its concern is how to derive reliable and probably maximum returns from all possible endeavors both on short- and long-term bases. This concern revolves around the following decisive questions: "_which_ resource to utilize," "_how much_ of each," "_how many_ . . . to exploit," and "_how_ and _when_ to exploit them" (Jochim 1981: 64).

These interactive systems of strategies dealing with these questions can be analytically distinguished; food procurement practices, settlement pattern, and balancing mechanisms.

Food Procurement Practices

A population, like the Batak whose resources are varied, is constantly faced with making decisions on which resources to utilize, and what techniques to employ. In such decisions, two conditions may be considered, efficiency and security.

Efficiency: Efficiency may be viewed in energy terms as a cost-benefit ratio (Keene 1979; E. Smith 1979). When used as a basis for feeding selection, this may act to increase the ability of the organism to recognize food needs within some optimum range, choose the best (and most economic) foods, locate, acquire and ingest food in the most economical manner (Emlen 1973: 157). While this is an objective measurement, a rather subjective criterion, like the prestige people attach to a particular food resource, cannot be ignored. The choice of resources, therefore, may be based not only on the amount of energy yielded per unit of energy expenditure, but also on such intangible gains as status or prestige. In general, the Batak demonstrate highly calculative economic behavior in their choice of resource use over time. However, their general preferential tendencies for purchased rice over wild root crops, which gives a higher caloric return, during the months when their own swidden rice is gone indicate that there is also a subjective basis for the choice, such as prestige[1] (also see Eder 1978). Prestige consciousness however may be inconsistent with their ideology of egalitarianism. Yet some changes in their world view are inevitable. They may already be starting to see themselves in the other ethnic groups' social mirror as they intensify their socioeconomic ties. Jochim (1981: 113) suggests that the idea of widening their credit lines

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[1]The idea that the taste of rice is better than wild roots may constitute another motivation for their preference seems not to be supported by my ethnographic evidence. Most Batak claim that unlike rice, they can eat wild root crops without any side dishes. Also, especially during my first contacts, wild root crop foods were generally hidden from me as if there was a social stigma attached to eating them while their cooked rice was more displayed.

with the cereal merchants, thus assuring themselves of a buffer during emergency food problems, in return for commercial forest products may be appealing as a motive for this preference. Such an explanation is, however, doubtful since the unusually high rate of interest lowland creditors impose on their Batak debtors will further jeopardize the already low cost-benefit ratio. With traditional foods, however, such as wild root crops, a Batak generally prefers one that would give higher yields per unit of labor invested (see Eder 1978: 61).

To a preliterate as well as an advanced Westernized society, time is an economic commodity. The Batak's preference for nocturnal (over diurnal) collection of shellfish is wiser as empirically demonstrated by the number of hours spent and the volume of the catch (see Appendix G). For women whose time is limited, such as those with suckling infants, less mobile riverine food products with higher yields per unit of time spent are preferred, although they are considered less desirable. Solitary hunts are preferred to collective ones when the meat return from wild pig is low per unit of time.

The positive correlation between higher levels of procurement mix and the increasing intensity of food scarcity appears to support the idea that the Batak only work as hard as necessary increasing labor input under pressure by food shortages (Jochim 1981: 72; Zipf 1949). In the months of food scarcity, subsistence activities are intensified by utilizing as many resources as possible in the area thus increasing their foraging efforts. In the months of abundance, efforts are reduced and food supply is now mostly taken from the harvestable crops in their swidden fields.

The implementation of more modern tools and techniques can increase food production efficiency per unit of time, labor and land compared to the traditional ones. Hames (1979: 219) found steel axes to be 300 to 500 percent more labor efficient than stone axes. Mark's (1977: 32) study in the valley of Bisa of Zambia revealed that using shotguns was more profitable than using muzzle-loaded guns. The productivity of bow and arrow hunting among the Ye'Kwana and Yanomamo of Amazonia range from .29 to .92 kilograms of game per man hour while almost three times that much is produced by a hunter using a shotgun (Jochim 1981: 115) and the other accessories that go with the whole Western hunting technological complex (Sponsel 1981: 373). Moerman's study (1968: 171) indicated that in Thailand, an agricultural society, tractors improve the efficiency by 300 percent a day over that of water buffaloes.

There appears, however, a threshold point of intensification beyond which diminishing returns can be expected (L. Brown 1981: 103) especially if a Western-based technology is employed in a non-Western society. Umehara (1978) measured the increase in the level of production in comparison with the cost in intensified irrigated agriculture in Nueva Ecija Philippines between crop years (CY) 1970 and 1978. The average yield per hectare increased by 15 percent (from 41.68 in CY 1970 to 47.98 in CY 1977-1978) while the average cost of production increased by 70 percent from 25.11 to 42.78 cavans. This means the average return per hectare actually decreased by 219 percent, from 15.67 to 5.20 cavans (also see Cadelina 1982a). The increase in the cost of technological input needed by the (paradoxically) so-called high yielding (HY) varieties of rice (Ofreneo 1980) caused the tremendous decline of returns. In fact, it is precisely the technological intensification that may eventually lead certain agro-ecosystems in the tropics incapable of nourishing crops. Farmers in Asian countries are now beginning to complain about the increasingly poor performance of their farms after continuous use of commercial fertilizers. Experimental studies on multi-cropping (MC) in the University of Chiang Mai, Thailand, showed a tremendous decline of rice production in the three-cropping paddy fields after three years of intensive use of commercial fertilizer (Gypmantasiri, et al. 1980: 92). From a peak of seven tons per hectare in 1971, the yield has continuously dropped to its lowest level of four tons per hectare in CY 1977-1978 (see Figure 19). Other crops suffered just as badly.

The decline in the soil performance is complex. The heavy use of ammonium fertilizer causes the loss of calcium and the lowering of the soil pH (Gypmantasiri, et al. 1980: 92). In the MC experimental plots, severe soil acidity has developed within the first three years of use from a value of 6.5 to less than four. When the soil is highly acidic, it inhibits the reversion of a potentially toxic divalent manganese ions to insoluble tetravalent manganese which prevents its absorption by plants (Gypmantasiri, et al. 1980: 92). Plant analysis of the MC crops showed more than 2,000 ppm manganese in peanut and mungbean leaves, considered to be unusually high. While it is argued that this increasing acidity of the soil can be reduced by commercial liming, it is now believed that this may cause certain nutritional imbalances in the soil (Gypmantasiri, et al. 1980: 92).

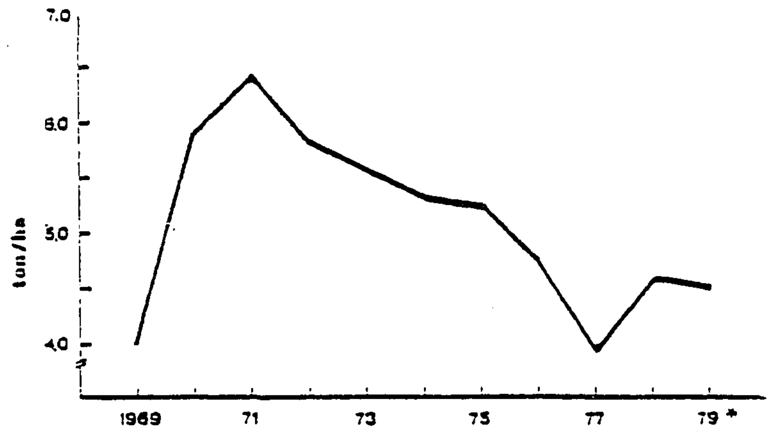

Figure 19. A Declining Trend in Rice Yield Under High Inputs and Intensive Cropping (3 Crop/Year) at MCP Experiment Station. Means of 16 Half Rai Plots, *Mean of 4 Plots (from Gypmantasiri, et al. 1980: 93). Taken from Rambo (1981: 11).

The Batak are now using the locally made muzzle-loaded gun. They themselves have reported the great superiority of this gun over their traditional bow-and-arrow and spear. The employment of the rifle, however, could have long-term deleterious effects. Chances of future encounters may decline as the frightened game animals retreat deeper into the forest. Also, it is precisely this high level of efficiency that may lead to game over-kill.

The "pursurer" and "searcher" dichotomy in the lower forms of animals on the basis of the kind of prey they stalk (see MacArthur 1972) applies to the way the Batak divide labor between the sexes. The women are the "searchers" who generally collect the sessile or less mobile food resources. The men are the "pursuers" who are responsible for catching the more mobile ones, including those resources that demand more energy for obtaining as well as those with higher risks involved. Present evidence seems to suggest that this sexual division of labor is not only determined by the people's traditional norms but also by some ecological factors. It is possible that in certain ecosystems where game animals are more abundant than collectible carbohydrate and vitamin foods, both men and women may participate actively as pursuers. Among the Agta hunters and collectors in the Sierra Madre mountain range of Northeastern Luzon, participating women do contribute substantially to their meat supply by several styles of hunting, including bow and arrow (Estioko-Griffin and Griffin 1981b). Recently it is believed that the same area has still more game animals than other collectible food.[2] Emic reports showed extraordinary abundance of game animals in the past according to the Griffins and Headland (personal communication).

It appears that daughters are deliberately trained for hunting. As the girls grow older, they receive frequent training, as the boys do. The Griffins estimated that between 40 and 60 percent of the adult women in the entire Agta population in the area are presently participating in hunting. In some isolated segments of the population, nearly 100 percent of the adult women hunt at one time or another, the Griffins claimed. This phenomenon is not, however, peculiar to the Agta. Fox (1953: 263) casually reported that among the Negritos in the Pinatubo Mountain range of Zambales, some women were excellent bow-and-arrow hunters. The Griffins speculated that as the contact between the Agta and the lowland peasant farmers (who put negative value on women

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[2] Personal communication with Estioko-Griffin and Griffin, 14 August 1982.

hunters) intensifies, the former's attitude toward women hunters may change. Also, their contacts with the lowland peasant farmers may open new options for other subsistence activities for women which may replace their hunting enterprises. Further, as game supplies dwindle, female participation may no longer be profitable.

The women tend to be generalists in their pursuits while the men are the specialists. All food procurement efforts that have the following characteristics are largely the domain of men: those involving highly mobile resources, those involving high energy-demanding resources, and those that need complicated tools or processes. Due to the more general responsibility of the wives in the domestic and food production activities, they are commonly found around their settlements. The men are more active away from their camp, a situation that fits into Watanabe's (1968) "activity fields" concept.

Men may do the tasks of women when collectible food resources are extremely abundant so that an immediate supply of extra labor is needed; if the men are free while the women are busy; and, if there is an immediate or emergency need for the resource. On the otherhand, women may participate in men's activities such as hunting, but mainly they do the simpler tasks of "bush beating and driving," for instance, in sagbay hunting.

The "searcher-pursuer" dichotomy of the Batak sexual division of labor is therefore not rigid. It is so fluid that men can move into the "women's economic sphere" if circumstances demand. While it is easy for the men to move into the women's domain, the reverse is not true among the women due to the nature of men's activities. With such fluidity, men are not completely barred from a particular woman's food activity when circumstances demand. Hence, it provides an opportunity for optimal utilization of resources.

The diversity of the Batak's subsistence activities indicates a number of things: first, it shows the variety of resources available to them; second, it shows the number of options at their disposal to meet their own food problems; and third, the Batak heed the negative feedback arising from their food shortage problems. Instead of intensifying their technology to meet the declining food supply, they have retained a generalized subsistence system while keeping their population low. Although at present there is no conclusive empirical evidence to determine the exact cause of the Batak population size, the fact that their present population size is advantageous (given their available resources and technology), still remains.

Security: While efficiency is measured by the amount of return per unit of time, labor and land spent on a synchronic basis, security is aimed at maintaining this efficiency on a diachronic basis. In short, it is efficiency in an "elapsed time" (Jochim 1981: 90). It is addressed at maintaining the reliability of return from various food production activities.

On the basis of resource availability, food can either be predictably or unpredictably variable (Jochim 1981: 91). The variability of resources depends on a number of risks a population has to face, such as the physical environmental conditions or the conditions of the food resources themselves. There are three dimensions which seem to be relevant to the way the Batak handle the variability of their supply; temporal, spatial, and degree of abundance of supply (also see Jochim 1981: 92; Dyson-Hudson and Smith 1978).

The concern for the security of food supply is universal, although various cultures have different ways of contending with the risks associated with food problems (Jochim 1976: 16-17; 1981: 91; Bronson 1972: 100; Johnson 1971b; Wharton 1969). Johnson (1972: 151) observes that traditional agriculturalists in fact prefer costly low risk strategies with little return over those high risk ones with big returns (also see Jochim 1981: 91). This suggests that risk minimization does not necessarily mean maximizing returns. Among hunter/gatherers and marginal agriculturalists, this may only involve avoiding the perceived or real risk (Wiessner 1977: 10-11). Wade's (1974: 1189-1191) study on the Green Revolution revealed also that the peasant farmer's number one goal is not to maximize profits but to minimize risks. Among marginal agriculturalists, such as the Batak, this constitutes one of the important considerations in the choice of resource and technology.

The widening of their niche-width as food scarcity intensifies is reflective of their efforts to minimize the risk of failing in one pursuit. The change in niche-width also suggests a change in their dietary habits in the period of food scarcity. Since their foraging episodes during these months tend to be more opportunistic, their diet tends to be highly generalized to include the least preferred foods. Unlike the pattern in the period of abundance, flexibility is the rule.

To minimize the risk of a drastic gross decline in their food production due to the substantial disruption of their "pristine forest ecosystem" by logging and other food production activities by other ethnic groups, they try to enlarge their swidden fields and participate more in cash trade. The more intense human activities in the forest may have depleted their hunting resources. Game animals retreat to the interior and become more elusive, making their traditional weapons less effective for a substantial catch. The use of muzzle-loaded gun becomes increasingly practical, the Batak claimed.

Settlement Pattern

While the Batak's food procurement practices enable them to obtain the necessary food from their resources, their settlement pattern makes possible the distribution of the feeding pressure on these resources. Provided other factors are constant (see Connel 1978; MacArthur and Wilson 1967; Diamond 1973; 1978; McNaughton and Wolf 1970; Jochim 1981: 48-49), the lesser and the more equal the feeding pressure, the better the ecosystem's chance of being self-sustaining. Thus, production efficiency may be sustained and the risk of starvation may be reduced.

In a highly mobile population, frequent movement of the people constitutes a strategy of equalizing the feeding pressure on their resources while up-to-date information concerning resource conditions is constantly provided. As the population becomes more sedentary, the feeding pressure may become more concentrated. Knowledge about their resource conditions in their total ecological range may also diminish. Among marginal agriculturalists with an increasing sedentary life, such as the Batak, this can become a major problem. Three related issues may be considered: settlement permanence, settlement location, and settlement size.

Settlement Permanence: Although the Batak village is permanently situated in one contiguous area, a number of widely scattered settlements (each comprising some nuclear families), usually lasting from two to six months, are established.

The location of a cluster of huts is determined by swidden sites and the cluster is primarily composed of kin. Seasonal changes and the swidden cycle cause settlements to shift, redistributing people around the area. In this manner, the feeding pressure is shifted from the resources of one particular area to another. Regeneration can take place where the feeding pressure is lifted.

Among other things, the da-us camps during summer bring the people into closer contact with the lowland peasant farmers who, at this time, are in need of the former's labor. Commuting time and energy expenditure are therefore substantially reduced.

Settlement Arrangement: Clusters of huts are distributed over a wide area. Each cluster is held responsible for keeping others informed on the state and conditions of resources available in their own respective "sector of responsibility." When resources of extraordinary abundance are available, information is passed on to others who in turn dispatch their labor to the resource site. Viewed in this context, a system of "communication networks" is formed to minimize risk of wastage and consequently for optimal resource use.

The frequent and regular household fusion and fission reshuffles households to different settlements which have implications both in resource use and in labor demand and supply among households and settlements.

Settlement Size and Composition: Since there is no problem of raiding or warfare, a settlement is generally small, consisting of two to four nuclear families at most (around eight to sixteen people), closely related by kinship. A cluster tends to be self-contained in terms of producer-consumer members. It may include a retired couple, but productive couples with dependent and/or productive offspring are always present.

Two basic demographic features are apparent in the Batak settlement --the small number of individuals and the balance in age and working capabilities of members. The size creates little pressure on the resources while it allows a manageble number of households for intensive food sharing and redistribution during periods of food scarcity. Given their demographic structure, a cluster of households can be economically self-supporting, a situation similar to what has been reported by Estioko-Griffin and Griffin (1981a: 126) for the Agta in Northeastern Luzon.

Balancing Mechanism

Although the resources and the techniques in food procurement are equally available to all households, different domestic units may have varying levels of success in food production. The difference can be attributed to the kind of resources and techniques different households employ at a particular time. On the other hand, the household's changing life-cycle may cause it to have a different food supply and demand levels. Response to this imbalance could either take the form of "anticipatory" or "compensatory" measures (Jochim 1981: 165).

The anticipatory measures are preventive. Here, the possible imbalance between food supply and demand is foreseen. On the population level, equalizing success in food procurement efforts over time may be anticipated by employing a number of strategies such as: (1) technology which emphasizes conservation and risk minimization; (2) population control (Ammerman 1975; Hassan 1978); (3) establishing territorial rights to prevent unnecessary competition and guarding costs (Klopfer 1969; Kummer 1971); and, (4) establishing long-term socioeconomic credits with other populations (Heider 1969; Pryor 1977) through exchange. On an interhousehold level within the population, establishing long-term social credits is most commonly employed along with other strategies. Among the Batak, three main strategies are employed: population control, technology emphasizing conservation and risk control, and exchange.

The anticipatory mechanism may not necessarily eliminate the expected imbalances at either the population or household level among the Batak. For instance, an imbalance may result from the inherent demographic structure caused by the cycle of the household bringing substantial interhousehold variation in the level of food supply. When this happens, compensatory mechanisms may be employed.

In some societies where production failure on the population level is substantial due, for example, to unexpected natural catastrophe, strategies such as warfare (to take away the stored resources from other population groups) may be employed (Jochim 1981). People may be redistributed (Suttles 1968) by migration such as in a frontier settling or in circular migration (Chapman, in press). Or food resources may be redistributed through exchange (Suttles 1968).

Food imbalances among the Batak can be viewed both on a temporal and developmental level. Due to the seasonality of resources, food shortage occurs periodically. During these periods each household faces a different degree of food scarcity, due to its particular stage in the developmental cycle. The technological and social responses complement one another in handling both the temporal and the developmental food imbalances.

Food exchange (such as barter, cash trade, or sharing) in many studies has been primarily viewed in the context of harvest timing differential between two geographically close groups (Jochim 1981: 178); schedule differential of resource seasonality (Piddocke 1965; Suttles 1962); niche differential (Vayda 1967); and individual differences in the schedule of success among hunters (Jochim 1981: 178). It is apparent that these studies have neglected the interhousehold variation of food production due to varying manpower supply and levels of caloric needs associated with family life-cycle stages. This variation consequently brings interhousehold food imbalances, a problem minimized, among the Batak, by interhousehold food sharing.

Food Consumption

Food management analysis is never complete unless the consumption phase is considered. Batak food consumption practices are rather opportunistic. When food is extremely abundant, food consumption is unrestrained; when food is limited, consumption is controlled. It is a strategy of matching food intake with food supply. They can afford to grow thin during periods of scarcity and fatten themselves in the harvest and post-harvest periods. For households where caloric needs are high, due to young growing household members, or where production is extremely low, as with retired senior couples, per capita food consumption exceeds per capita household production. The difference between the amount provided by the household's own efforts and the amount consumed is made up from food gifts from other households with better food supply conditions.

In some societies, interhousehold food allocation may be employed where food may be distributed among its members according to their needs (Colson 1979; Dirks 1981). Among the Batak, there is no apparent intrahousehold food allocation pattern, except in emergency cases, such as when someone is sick. The extraordinarily long breastfeeding period, if it constitutes a substantial nourishment for the child, seems to suggest a strategy of intrahousehold food allocation. Older siblings can feed on the scarce solid foods while the youngest is breastfed indefinitely.

Conclusions

The present demographic conditions of the Batak should not necessarily be viewed only as an indication of their inability to cope with the problem of limited food. Aside from considering depopulation as a consequential <u>condition</u> from their failure to adjust, it should also be viewed as a positive process of coping with the increasing food supply difficulty given their present technological system and resource conditions.

The Batak food supply has progressively declined due to resource depletion and interethnic competition in the use of these resources. It is also cyclically fluctuating during three different periods annually; pre-harvest, harvest, and post-harvest. This regular fluctuation is caused by the seasonality of their resources. Although all households are affected by this fluctuation, they do not however experience the same degree of food supply difficulty due to their varying life-cycle stages. Some households in certain stages have more workers with lower caloric needs.

Four areas are relevant in the understanding of the Batak food management system: food procurement practices, settlement pattern, mechanisms for equalizing food between households, and food consumption patterns. While they have responded technologically to the progressive decline of their caloric supply, they try to cope socially with the problem of cyclical fluctuation of food supply. Interhousehold food sharing constitutes a major balancing mechanism.

Interhousehold food sharing is a socioeconomic behavior of moving food from households of higher, to households of lower food concentration. Biologically, it is a process of providing the essential nutritional requirements of individuals (Lee 1969: 74) through sharing various food resources (J. Peterson 1978: 83). It is a system that is rooted both in the Batak beliefs, norms and traditions and in their total food management complex. This is best understood in the context of family life-cycle stages. Households whose family life-cycle stage is favorable to higher per capita food productivity and whose caloric needs are decreasing--due to changes in household size, composition, age structure, and the physiological requirements of the members--are generally the givers of food to households in different circumstances during periods of food scarcity. Viewed in the developmental cycle process of households, "social balancing" in a generalized reciprocity is a long-term process, not a social condition achieved in a single socioeconomic transaction.

Depending on the stage of the household, interhousehold food sharing of the Batak may be seen as existing in a continuum from generalized, diffused and generous (tending to be symmetrical) to discriminate, focused and controlled (highly asymmetrical).

Symmetrical food sharing is commonly correlated with (1) long-term optimization of socioeconomic payoffs and minimization of long-term risks; (2) periods of food abundance when foods have little or no immediate utility value; and (3) exchange among individuals including those of distant kinship and geographic location. On the other hand, asymmetrical food sharing is commonly correlated with (1) short-term optimization of socioeconomic payoffs and minimization of short-term risks; (2) periods of food scarcity when foods have great immediate utility value; and (3) exchange among individuals of close kinship and geographical proximity.

The sharing of capital resources into which the recipient still has to invest his energy to obtain food, is generally seasonal and follows the agricultural cycle. The intensity of sharing information is positively associated with the intensity of food scarcity. Unlike sharing food, only kinship and geographical distance between households affect interhousehold sharing of capital resources. In sharing food, the following factors are associated: manner of sharing, types of food, kinship, and geographical distance between households.

Information sharing, as a coping mechanism, is related to ecology and mobility. While it helps people who are becoming more sedentary at present to survive, it enables them to preserve their resources.

The Batak experience does not clearly support the idea that food sufficiency (J. Peterson 1978: 101, 105) has to be established during food difficulty. The population's prime concern is not necessarily how to achieve caloric sufficiency during periods of scarcity, but how to make the most out of the minimum supply of food to tide them to the next period of abundance. It is apparent in their adaptive behavior that caloric adequacy is never achieved during food stress. What is necessary is the minimum amount to make it through the period of stress to the period of abundance. According to Liebeg's Law of the Minimum, adaptation involves the process of sustaining the minimum level of the most critical factor (Sutton and Harmon 1973: 177). In evolutionary terms, sociocultural and biological selection may work under extreme environmental fluctuations.

The following related conclusions have to be stressed. First, all the Batak villages do not differ substantially in their resources, only in degree.

Second, among the Batak there are no clear or rigid territorial boundaries, hence there is no clear definition for exclusive territorial use. Different groups cross territorial boundaries easily, a case not only peculiar to the Batak but also to other hunters, collectors and marginal agriculturalists.

Third, food scarcity among marginal agriculturalists, such as the Batak, cannot be adequately viewed as an average or mean constant over time. Food scarcity is rather a cyclical phenomenon which the Batak have to deal with and it is in the regular occurrence of food fluctuation, aside from the gross caloric decline, to which their present adaptive behavior is addressed.

Fourth, a household is not a static social unit with an unchanging demographic structure. It is dynamic and its labor capability and caloric needs change over time. Households with favorable labor capability and with lower caloric needs are in a position to give assistance to others who are experiencing more difficulty. It is therefore not necessary that the transacting units in an interhousehold food sharing system should come from different geographical areas where resources are different, or that the units be exploiting different niches (Vayda 1967).

In periods of stress, such as wartime, natural disaster, and energy crises, practices of sharing and reciprocity take place in Western communities which contrast with the competitive and individualistic mode, more common during normal conditions. These Western sociocultural mechanisms for dealing with emergencies are not unlike those for handling seasonal stress among the Batak.

Interhousehold food sharing behavior, analyzed holistically in the context of food management, has two dimensions--symbolic and material.

The reductionist either emphasizes the symbolic or the material. He fails to see the interrelatedness of these dimensions. Consequently the full meaning of exchange is lost. Using the cultural ecological approach, this work has demonstrated the material implications without obliterating the symbolic ones.

CHAPTER X

ASSISTANCE PROGRAMS AND POLICY IMPLICATIONS

> Both economic pressures and political instincts encourage a short-term focus but pressures to wring too much out of the land in the short run can destroy it over the long run. . . . Taking part in the creation of a sustainable society will be an extraordinarily satisfying experience . . . . We have not inherited the earth from our fathers, we are borrowing it from our children. (Brown 1981: 369)

Gaining knowledge about man's responses to deprivation is not enough. It has to be used tangibly for making human life better. One last question must be considered: What did we learn about the Batak that will serve as a basis for assisting them?

We have learned that the Batak occupy the marginal upland forest areas which are ecologically fragile, extremely sensitive to intensive human intervention. In this area they have to contend with two types of food problems, the progressive food decline and the yearly cyclical fluctuation between high and low food supply. While the first type is caused by the depletion of their resources due to the increasing human economic activity in their forest ecosystem, the second is caused by the seasonal characteristic of their food resources. The first is relatively new and an outcome of the increasing outside population pressure intensifying interethnic competition in the use of their resources. On the other hand, the seasonal rise and fall of food supply is an old problem that the human populations, in fact, have been dealing with since the Pleistocene period. Due to the structural and functional changes of their ecosystem, their traditional social responses to the latter type of food problem like band splitting or circular migration have lost their adaptive value. The remaining primary solution is interhousehold food sharing. They may be able to ward off starvation from cyclical food stress for now, but the problem of progressive food decline will still remain as a sword of Damocles over their heads.

Integrating subsistence with commercial gathering, wage labor, horticulture and other options constitutes their technological response to the progressive gross caloric decline. Although such new food production systems may have improved the absolute amount of the food production, in terms of caloric output-input ratio, it is less efficient than their traditional ones. The Batak have simply no choice at present because of the increasingly limited alternatives to their new economic system. To the naive observer, technological intensification may be the answer, but it is precisely this that has imperiled the food production sustainability in marginal uplands.

The Batak have been in this predicament for almost a hundred years. At this time, they have evolved a system of food procurement which, as my indirect evidence suggests, is conservation-oriented and risk-minimizing. At best, and on their own terms, it is even self-sustaining. The problem they are facing today is not of their own making, rather it emanates largely from the outside where values, motives, and actions contradict those of the Batak. While the Batak do try to preserve their forest ecosystem, the lowland farm-oriented peasants who know next-to-nothing about forest ecology unwisely convert the hillside forest into an intensive mono-crop agriculture.

Historical evidence suggests that the only viable human society is one that is self-sustainable. More convincing data at present show that the downfall of the early civilizations such as the Mayan (Deevey, et al. 1979) and the Mesopotamian societies along the Tigris and Euphrates River Basin (Jacobson and Adams 1958) was due to the "cumulative environmental stress that eventually reduced food supplies and undermined their economies" (Brown 1981: 4). In Building A Sustainable Society Brown noted with particular reference to the Maya:

> The members of the joint research team . . . who made these discoveries observe that population-induced environmental stresses had become intense during the centuries preceding collapse. They report that the area was almost deforested by A.D. 250. Deforestation and mounting pressure on croplands then led to the loss of topsoil and the gradual decline of the land's productivity. In passing, the research team points out that the environmental havoc so discernible from our current perspective may not have been perceptible to the (quoting Deevey, et al. 1979) "managerial elite or their economic advisors." (Emphasis mine) (1981: 4).

Resource Depletion

Today, the utilization trends of land and forest resources are towards technological intensification with high level of exploitation. The rate of depletion and destruction are increasing. If not regulated, these practices will eventually lead to resource degeneration.

Let us follow one indicator of environmental stress occurring in the Philippines. Results of environmental research on the country's tropical forests is not encouraging. They reveal the rapidity of environmental disentegration. They reveal how strong the population pressure is on resources, and from which sectors this pressure originates. They also reveal who is directly and indirectly affected by the stress. For instance, intensive wet-rice agriculture, which is dependent on adequate water supply from watershed areas, is adversely affected by the continuous disappearance of the forest while the natives' food resources are directly depleted.

The data on forest condition are not complete and at worst are unreliable (Persson 1974; Sommer 1976; Myers 1980; UNESCO 1979). Although reliability has been the most important consideration in most recent estimates (see Myers 1980), figures cited should only be used as trend indicators rather than absolutes.

With a population of almost 47.5 million in mid-1979, the country has the smallest forest area per head in Southeast Asia, only .24 hectares in contrast to Thailand (.32 hectares), peninsular Malaysia (.65 hectares), and Indonesia (.8 hectares) (Myers 1980: 95). The low man-forest ratio has been due to intensive commercial selective logging, expanding legal agriculture (every year around 500 square kilometers of forest land are alienated for legal farming), illegal agriculture (commonly known as squatter farming [kainginero]), and natural catastrophe. In 1978, around 1,000 square kilometers of primary forest were estimated to have been extremely degraded by intensive commercial logging paving the way for illegal forest farming. At present around 380,000 families were engaged in kaingin, occupying at least 23,000 square kilometers of forest, and around 13,000 of these families are now occupying critical watershed areas (Myers 1980: 96).

There are conflicting reports concerning the precise area of Philippine forest left at present. A more reliable estimate using Landsat imagery and digital data for 1972-1976 supplemented by areal photographs, reconnaissance flights over selected areas, and topographic maps (see Lachowski, et al. 1978; Roque 1978) showed that in 1976, there were only around 114,616 square kilometers, or some 38 percent of the country's land area, which was forest covered (Myers 1980: 98). Palawan still has the biggest proportion of forest land (75 percent); followed by Mindoro (49 percent); Mindanao (42 percent); Luzon (36 percent); and Visayas (24 percent) (Myers 1980: 100).

The Landsat survey also indicates that from 1971 to 1976 the country was losing forest at an average annual rate of around 3,000 square kilometers. This deforestation is believed to be growing to between 5,000 and 7,000 square kilometers per year. Myers (1980: 99) estimated that the "latter rate, which is likely to accelerate, would theoretically bring an end to all forests within 15-21 years."

The National Economic and Development Authority (NEDA), the National Environment Protection Council (NEPC), and the Population Resources, Environment and Philippine Future (PREPF) have now recognized the threat of deforestation in several major watersheds in the country. They have strongly required that around 17 percent of the country (around 52,166 square kilometers) "must be reforested, in order to safeguard watershed, reduce soil erosion, and supply other environmental services" (Myers 1980: 101). The proportion of the present area of Philippine forest relative to its total land area is now around 4 percent lower than that which the government has defined as necessary "to safeguard economic and development interest" (Myers 1980: 101). Based on a number of criteria, it has been determined that around 42 percent of the total land area of the country should be covered with forest. Reforestation is now in progress. The estimated average rate of 175 square kilometers per year (Tagudar 1978) is rather generous considering that some sociocultural factors seem to be at odds with reforestation efforts. Granting that this is the actual rate of reforestation, still this is far lower than the present annual rate of forest loss. With an increase in foreign as well as domestic demand for wood, there will still be lower wood supply than demand by the year 2000 (Dung 1975; Revilla 1976). This suggests that there is a very good chance that all of these plans will go to waste.

There are two major factors that cause this rapid decline of forest resource. First, is the intensified commercial logging due to the increasing demand for wood. It is estimated that world consumption of wood in the last quarter of this century is going to increase by 135 percent. Need for fuel wood will increase by 66 percent; poles, sawn wood, and panel products by 179 percent; and, wood pulp products by 246 percent. Of the three areas of tropical hardwood suppliers in the world market, South and Southeast Asia have produced the highest (93 million cubic meters) and exported the most (65 million cubic meters) in 1980, against Tropical Africa which was producing 20 million and exporting only 12 million and Latin America producing 32 million and exporting only four million. It is estimated that in 1990 a similar pattern will prevail at an increasing level. Myers (1980: 35) observes, "By far the major source of tropical hardwoods to date has been Southeast Asia. Between 1950 and 1973, the region increased its exports 24 times, until it was accounting for three-quarters of international trade in tropical hardwoods." It is apparent that it is Southeast Asia that suffers most at present from the deleterious effects of logging activities. While the developed countries are able to preserve their existing forest (in spite of their increasing lumber needs) by importing, the developing countries have and will have to suffer the irreversible effects of deforestation if they continue to provide these resources to the former.

The ecological impact of commercial logging is complex, ranging from the disturbance of other floral (Burgess 1971; Ewel and Conde 1976) and faunal species (Hardjosentono 1978; Harrison 1968); soil impaction by heavy machinery (Burgess 1973), and soil erosion. The climate may be affected since forest cover influences ground temperature, rainfall and regional weather patterns (CSI 1982: 3). Forest retains rainwater and allows it to seep downward to refill underground storage. When forests are removed, rainwater quickly runs off without sinking thus causing water tables and stream-flow to fluctuate. Irrigation systems will be directly affected while runoff water inundates rivers and other bodies of water causing floods. The worst flood that ever hit the southern and northern Philippines during non-flood months in 1980-1981 was linked to excessive logging. Soil erosion caused by rainwater runoff can lead to siltration of rivers and estuaries killing their plant and animal life that may provide food for the human population. Hydroelectric dams are also affected. Quoting the Agency for International Development report, Brown (1981: 38) noted the present state of the Ambuklao Hydroelectric Dam in the Philippines, "The cutting of timber and the subsequent loss of water retention capacity of land surrounding the reservoir has resulted in massive silting of the reservoir, reducing its useful life from 60 to 32 years."

The other factor that has caused rapid disappearance of forest is the country's still high rate of population increase. With its estimated annual rate of natural increase of 2.4 percent, the country is believed to have a doubling potential every 29 years. This potential has caused a lot of people to seek lands and take whatever opportunities there are, even illegal forest farming. They have no other choice, but are compelled by circumstances in order to survive. The increasingly tougher laws against illegal cutting of trees has been circumvented by following and occupying logged-over areas. The increasing number of people has also meant increasing needs for logs for housing materials as well as for fuel. Village studies in Tanzania and Thailand, just to mention a few, showed an annual per capita consumption of firewood ranging from one to two tons (Brown 1981: 36). As population density increases more people will be taking firewood from nearby woodland or scrub, and as depletion accelerates it forces people to move further afield. In some places commercialization of firewood is becoming lucrative and in fact now involves considerable distances. This is increasingly pronounced in certain places in the Philippines, notably in the island of Cebu (one of the Visayan provinces with the lowest per capita forest supply).

It appears that the forest is the heart of a long-term economic system.[1] Croplands which are the "foundation not only of agriculture but

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[1]The disappearance of forests could also mean the loss of minor forest products (latex, resin, oil, nuts, rattan, etc.) whose local and international demand is increasing. It could also bring to an end the further discoveries of medicines. At present, it is estimated that around half of the medicines in the drugstore have their origin in materials taken from tropical forests. A child with leukemia has now an 80 percent chance, compared to only 20 percent in 1960, of improving

of civilization itself" (Brown 1981: 13) can be sustained when supporting systems help preserve soil fertility and maintain adequate water supply. Reports now indicate that the green revolution in Southeast Asia is beginning to falter because the water supply has declined making two or three crops per year impossible (CSI 1982: 3).

The immediate effects of forest destruction may not necessarily be equally felt by the different groups of the population. People whose food base is the forest (the ecosystem societies) are the first ones to feel the pain of forest damage. Their food problems definitely are exacerbated when faunal and floral resources are depleted due to the structural and functional alterations of the forest ecosystem caused by external agents. On the other hand, for people who are not directly dependent on forest products for food (the biosphere societies), forest loss is not an immediate threat for their survival. Ironically, the very first people to be hit most by forest destruction are those who throughout their entire lives have been trying to prevent that destruction.

Marginal Agriculturalists and Their Dilemma

It is apparent by now that the food-related problems the marginal agriculturalists like the Batak are facing today are not intrinsic. Increasing demand for forest products largely comes (in the marginal agriculturalist's view) from the "unknown huge enterprise somewhere out there." Likewise, more lands are sought by other population groups in

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if given vincristine, a medicine taken from a rainforest plant. Tropical forests provide the potential for materials from which compounds may be derived against other diseases like cancer and coronary disorders as well as contraceptives (CSI 1982: 4).

the country. Most marginal agriculturalists such as the Batak do not have a population size large enough to inflict considerable damage to their ecosystem. The rapid population growth rate occurs among lowland populations where infant mortality has been greatly reduced by modern medicine while fertility level remains high.

Whether change comes about by the modifications of the structural and functional characteristics of their physical, or social environment, it is inevitable among marginal agriculturalists (Pitt 1977: 11). The options available to them have greatly diminished as they start relating more intensely with other ethnic groups.

If you ask them to compare their life today with that of yesterday, they are quick to cite the many advantages of yesterday's life. Still, there is no turning back. One old Batak man asked me one day, "Why do people keep coming to our place?" The situation is so complex that I found it difficult to explain to him for fear of giving a simplistic answer.

While there are good reasons to believe that these people prefer to live in their traditional setting, political and economic reasons demand that these resources be utilized, but hopefully without bringing irreversible ecological degradation. Lacking other alternatives, compromise is the usual option. Unfortunately, ill-advised compromises can generally jeopardize the marginal agriculturalists' life, a situation they can hardly comprehend.

Views about Marginal Agriculturalists

There are at least three ways of looking at the present condition of marginal agriculturalists, such as the Batak. One looks at them as an independent, isolated segment of the national population, apart from the mainstream of the national economic system. In this view, two extreme ideas prevail. One is that they are an anachronism in the modern world. Appell (1975: 36) criticizes the thinking of most policy makers who consider these people as "illiterate savages with nothing to offer their country's growth and evolution" (also see Weiss 1977: 891). Their survival is taken, Weiss (1977: 891) observed, as a "reproach and an indication of a remaining task to be done" in modernizing a nation. Their economic system is believed to hold back the country's economic development and hence should be replaced by an allegedly more viable economic system. The other extreme considers them as living in a "well-integrated, self-contained and satisfying system[s]" if they are left undisturbed (Bodley 1982: 126). The idea is that marginal agriculturalists will have a better life if they are left alone hence any attempt to draw them into the mainstream of the larger economic system will only make their lives more difficult.

From another standpoint, marginal agriculturalists are viewed in the context of the benefits lowland farmers and marginal agriculturalists derived from each other. One extreme opinion is that marginal agriculturalists are parasites on the lowland farmers (Kroeber 1928: 19). In this kind of relationship the "interaction is necessary for the survival of the predator or the parasite" (Sutton and Harmon 1973: 184). The other opinion views their relationships as commensalistic (Sutton and Harmon 1973: 184) where one population (the lowland farmers) benefits while the marginal agriculturalists (such as the Batak) are not necessarily affected. In certain economic situations, this otherwise harmless relationship may develop, however, into one where the latter is exploited by the former (Rai 1982: 190-192).

The most recent view is mutualism or interactionism (J. Peterson 1978). Marginal agriculturalists are believed to be an integral part of a bigger economic system. There is a symbiotic relationship between marginal agriculturalists and the other population groups involved. By circumstance, both are forced to establish this structure of relationships. While the former provides the resources needed by the national or international economy, the latter provides the necessary links that will sustain marginal agriculturalists in their increasing participation in a wider economic system.

Marginal agriculturalists try to preserve the ecological balance of their forest environment by retaining a more generalized subsistence system and helping to protect the watershed for the much needed water supply for intensive farming in the lowlands. Since their technology is adapted to upland marginal areas, they are converting these areas into productive sites. For instance a Batak, by shifting his swidden every year, is able to draw around 5,000 kilograms of rice from a well-maintained hectare plot situated in areas with a slope between 30 to 60 degrees. With a technology that demands only an ax, a bolo, a trowel, and of course a forest where people can shift around, this yield level is better than that proposed in the Green Revolution with its high technological input requirements.

Of the three views, mutualism appears to be the most realistic. A policy of "isolation" or "self-containment" for marginal agriculturalists does not seem feasible since the economic ties between these people and the outside world had already started a long time ago.

Prospects for Assistance Programs

Since the terms "development" and "change" are usually thought of as value loaded, I am using "assistance" as a neutral term to denote helping people in a direction that will provide them maximum benefits. It is a model that is envisioned not only for the marginal agriculturalists but also for the larger economic system.

I will discuss this area by analyzing a number of falacies pervading many assistance programs and in the process suggest an alternative approach.

FALLACY 1: Marginal agriculturalists have little, if anything at all, to offer to national development. For many policy makers and change agents, marginal agriculturalists' economic system holds back the country's economic development. It has to be replaced by an allegedly more viable economic system. Under diminishing options, they are increasingly forced to adopt the technology in their upland habitat that is proposed for their lowland counterpart. Their system has to be replaced, obviously with tremendous ecological risk, since they contribute nothing but problems to the larger society. Paradoxically, the problems these people are presently facing are not caused by their own traditional technology per se, but by the modernizing process. Bodley observes:

> Many of the ethnocentric interpretations of tribal cultures are understandable when it is realized that development writers often mistakenly attribute to them the conditions of starvation, ill-health, and poverty which are actually related to civilization and industrialization. (1975: 11-12)

To be able to produce approximately 5,000 kilograms of rice in one hectare plot, if properly maintained, in marginal lands with steep slope, is evidence of good soil preservation techniques. Marginal agriculturalists have been accused of denuding the forest by cutting trees, but this act is never indiscriminate. Under this system they have sustained the production of minor commercial forest products such as rattan, wild resins, and wild honey for years. In 1978, using a very modest estimate, the total value of wild resin, rattan, and wild honey produced in Palawan alone was in the range of more than two million pesos (PDS 1979: 18). In absolute terms, this amount appears negligible if compared with the amount contributed by the other economic sector to the total national economic production. This is precisely the problem. Macro economics tends to look at their relative absolute contribution not in terms of the capital and ecological cost that contribution entails. While the intensive capital and technological system involves tremendous financial and ecological cost, the generalized extensive system of the marginal agriculturalists does not. Their contribution may be modest but it is <u>sustainable</u>. It is fallacious to make gross comparisons of the contribution to the total national economic production between two or more economic sectors without considering their respective ecological context.

Swiddening[2] is part of their whole subsistence strategy to keep food zones diverse while giving them a major carbohydrate food, rice. Trees are cut in a prescribed perimeter and left fallow for the forest to take over after a year of cultivation. While the natives are making

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[2]It should be borne in mind that there are two types of swiddening practiced in the Philippines. One is destructive while the other is "conservation oriented" and is practiced by the marginal agriculturalists (see Conklin 1957; Cadelina 1982b).

marginal agricultural lands ecolomically productive, they try to preserve the ecological balance in the area as well as in the low-lands. Watersheds are preserved keeping an adequate water supply for intensive agriculture in the lowlands. In a village of more than eighty individuals, only around three hectares of primary forest on the average are cut annually and left fallow by the next year.

If national development is viewed in the context of a sustainable economy, the marginal agriculturalists in fact would be valuable cooperators and protectors for sustained forest industries and agribusiness. In this context, they should not be exploited by out-siders for quick profit but should be treated as cooperators in the management of the forest resources for long-term use. The logging industry, agribusiness in the uplands and the lowlands, and the marginal agriculturalists are dependent on the forest. The Batak system of food production helps to conserve the forest for future needs. They are, in their own right, environmental engineers skilled in protecting the forest ecosystem.

FALLACY 2: Only new forms of technology can make the present life of these people better. Paradoxically, the opposite is usually experienced when a new, borrowed technology is used (Peterson 1982: 388). Due to the ecological degradation the new technology generally brings, it diminishes the local quality of life.

When assistance policies are designed, the first question asked is: "What can we offer to these people?" The "materialist-realist position" believes that the only way to help is to offer them new technology (see Appell 1977: 11). With the policy maker's own bias, he is tempted to offer a technology that has proven effective to him or to his own people. Inherent in this approach is the assumption that developed countries can provide the model for development in the tropics. Paradoxically, developed countries themselves suffer from many problems of technological imperfections such as environmental pollution and inefficient use of energy just to mention a few. Theoretically, this approach is also anti-ecological and anti-evolutionary. Since technological development is supposedly an adaptation to ecological constraints, then using a development model from temperate countries in the tropics, by all simple logic, is not sound and is inappropriate. In most cases this technology is out of ecological and cultural context and may only create disastrous effects on the life and environment of the natives (Appell 1977; 1975). The potency of "technological transfer" in assisting developing populations is now, in fact, a myth. Technological transfer has not always worked according to expectations. When developed countries transferred technology to developing countries without success, an example is provided so that this mistake should not be repeated for the marginal agriculturalists.

In terms of managing their ecosystem, marginal agriculturalists are in fact more advanced than their so-called "more advanced" lowland farmers counterpart. What is needed more is not the replacement but the improvement of their present system. Viewed in the context of a regional and national development scheme, the marginal agriculturalists are actually a vital component of a larger economy. For analytical purposes, their own system may be evaluated according to its role in the whole regional and national development plans while taking into consideration the impact of the assistance scheme on the people.

Policy makers, therefore, should instead be asking questions such as these: "What can these people do to help themselves and how can we assist them on this basis?" Adequate evaluaton of the people's own potential is necessary. Others, however, insist that immediate action is imperative and the approach should be based on "common sense." However, "common sense" is value-laden and one may be rising a wrong prescription. Appell observes:

> What concerns me is that if we operate under the guise of "common sense" the values may clash with the values of indigenous societies. This approach is furthermore part of the family of models or world views provided by our own society, Western society, the very society that has precipitated many of the threats to the survival of indigenous peoples. As a result, we could very well end up participating in the same set of world views and their derivative action systems that have already contributed to ethnocide. (1977: 13)

Intuitively, this approach is more difficult than when one works on the first question: "What can we offer to these people?" In the second question, information which most often is not available in the literature is necessary. This is where anthropology, as a discipline, should provide the data from which national policies could be drawn. Perhaps anthropologists in the developing countries today will be partly blamed for the errors policy makers have committed. More careful attention should be given to questions such as how marginal agriculturalists can be assisted and what can outsiders learn from them. The intention is not simply to collect a complex set of field data, but anthropologists should translate these data into a set of meaningful ideas for policy makers.

FALLACY 3: Any change program that helps the lowland peasant population will eventually benefit the native population.

Picking out key populations and geographical sectors for a program that increases food productivity with the idea that the indigenous populations will also benefit eventually, will not necessarily work for the latter population. The natives' concerns are never articulated in the total program. Inevitably the natives will be dispossessed of, and dislocated from, their own environments where their technology has evolved for centuries.[3] These possibilities are not seriously considered at the initial phase since the primary targets for assistance are the selected key segments of the population which will later supposedly assume the responsibility for bringing the benefits to the natives. This is apparently a vestige of the "trickle down effect" or the "development nucleus" theory which assumes that the benefits generated by a development program at a certain geographical point will spread out like the ripple effect in a pool of water. This has been the guiding principle for development in the Philippines. Such experience should tell us that if we employ similar principles for our native population, we simply repeat our error. Assistance policies should not rely on the "trickling," or on the "rippling," of benefits to intended beneficiaries. This will not work under the present socioeconomic

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[3]The Pantabangan Hydroelectric Dam and the Chico River Basin Development Program in Luzon, Philippines are good examples (see Carino, et al. 1979: 37-103).

structure of developing countries. Benefits should be brought to the recipient with adequate force.[4]

Model for Assistance Programs

The only viable assistance program for the marginal agriculturalists is one that is locally based and ecologically sound. By taking into account their psychological, cultural and technological preparedness to adopt, it appears that an integrated agroforestry program[5] is compatible with their own present conditions. While agroforestry allows the people to keep their traditional food production activities, as well as the recent ones like wage labor, it also opens new economic options for the Batak. At the same time, it is not only good for their own economy but also for the larger economic system. It is predicted that agroforestry together with agriculture will have more prominent roles in the economy than what it appears today as society is increasingly sustained by renewable resources (Brown 1981: 263).

Agroforestry is a practical approach since it is addressed at preserving the sustainability of resource use and is compatible with

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[4]Development is seen "as purely an 'economic' phenomenon in which rapid gains from the overall growth of GNP and per capita income would automatically bring benefits (i.e. 'trickle down') to the masses in the form of jobs and other economic opportunities. The main preoccupation was therefore to get the growth job done while problems of poverty, unemployment and income distribution were of secondary importance" (Todaro 1977: 441).

[5]Very recently an assistance program for an upland population in Palawan has been designed (see Fernandez, n.d.). Also see Rice (1981) on the Ikalahan development program in Central Luzon, Philippines. Also see Vergara (1982a; b; c; d; e) on his two-part information packet on legume-tree-based agroforestry.

the local people's socioeconomic, cultural, and ecological conditions. Very recently the working group on agroforestry of the Environment and Policy Institute of the East-West Center came up with the following definition:

> Agroforestry is any sustainable land-use system that maintains or increases total yields by combining food (annual) crops with tree (perennial) crops and/or livestock on the same unit of land, either alternately or at the same time, using management practices that suit the social and cultural characteristics of the local people and the economic and ecological conditions of the area. (Vergara 1982e: 13)

This system improves and maintains soil fertility thus sustaining productivity in two ways: (1) "by decreasing surface water runoff, nutrient loss, and soil erosion; and (2) by recycling leached and percolated nutrients and 'pumping' new nutrients to the soil surface where they can be used by food crops" (Vergara 1982: 13).

In contrast to the commercial agroforestry commonly proposed, this model advances a combination of subsistence and commercial agroforestry. It fits with the present Batak practice of integrating subsistence and commerical foraging. The subsistence type will be established in areas experiencing the least disturbance. These areas are generally situated in places which are least desirable for a relatively more intense human activity such as swiddening. Indigenous forest plants from which subsistence food can be derived should be preserved and possible ways for their cultivation and domestication should constitute one of the ongoing research efforts. Indigenous commercial trees (such as wild resins) and other forest products such as rattan growing in this area should be preserved and be part of the ongoing research effort, too. In so doing, the forest structure will be kept minimally altered to protect the faunal and the floral communities. Consequently, game supply for their traditional protein source can also be protected.

The commercial agroforestry will be established in areas which are presently experiencing the highest level of forest alteration. New tree species adapted to upland terrain which have commercial values (fruit trees, pulp trees, and leguminous trees for watershed cover, food, animal fodder and fuel needs) should be introduced without eliminating the remaining indigenous commercial plants. A specific portion of this area will be defined where shifting agricultural activity can be practiced. Such an area has to be planted with soil fertility generating trees such as the leguminous species which are fast growing to allow shorter fallow period. While an area is cleared for farm plots, the cut trees can provide the domestic fuel needs while the surplus can be traded in the lowland markets. Further, its leaves and pods have a very good prospect for an excellent feed for livestock and human food.

Integrating subsistence with commercial agroforestry will protect the people from the adverse effects of unexpected fluctuating market demand for commercial agroforestry products. This problem may be further minimized by organizing a marketing system that is designed to protect the interest of the native operators.

Two types of integrated agroforestry are possible: the plantation type, and the household farm type. Policy makers should remember that the plantation type will only make the life of the marginal agriculturalists more difficult if its structure is designed after the sugar plantation system in the Philippines where the workers are powerless and oppressed. A household farm type would be more appropriate since the natives will be the operators. They have the folk wisdom to deal with the forest ecosystem, an important requirement for the operation of the program.

For the specific objectives of the program, the people's own opinion should be regularly consulted. Particular strategies for realizing these specific objectives should be responsive to the people's changing life aspirations. Possibilities of organizing the people for an effective utilization of new food production opportunities outside their local community should be considered. Working as an organized group rather than as separate individuals minimizes the risk of exploitation by the other ethnic groups.

Although their present system has accorded them diverse types of food, much can still be desired for improvement. It is in this context that something new may be introduced. Anything that reduces their present food diversity may be physically (in terms of health), psychologically (feeling of security and of assurance of food supply), and ecologically (environmental integrity) lethal to the population. The ecological side effects will not only be felt by the natives but also by the larger population. The old stereotype that marginal agri-culturalists are rigid traditionalists is contrary to existing evidence (Vayda, et al. 1980). The Indonesian Borneo forest farmers are innovative, responsive, and flexible to changes in their environments. The Batak have demonstrated similar flexibility of response.
The model proposes: INNOVATION FOR IMPROVEMENT, NOT FOR REPLACEMENT (also see Grandstaff 1978). This allows functional permanence for their ecosystem, but with flexibility and resilience sufficient to accommodate various environmental stresses (also see Clarke 1977).

The viability of this model, however, depends on support from the outside, since most of the factors that have caused their present problems are exogenous ones. First, developed countries should not only be extractors of the forest resources in the tropics, but also protectors of its ecological integrity if wood supply is to be sustained. Fiscal support for ecological protection in the extraction of these resources should be provided rather than ignored "on the grounds that it would be . . . inflationary" (Myers 1980: 40). Since the developed countries are preserving their own forest reserves (by wood imports) at the expense of those in the tropics, they should help bear the burden of protecting the ecological integrity of these forest ecosystems. In the final analysis, we all ride in one vessel, EARTH. Countries can no longer establish borders between "developed" and "developing" countries. Second, timber suppliers should further improve their processing techniques of forest products to derive maximum fiscal returns. Third, loggers should be required by law to observe measures against irreversible ecological degradation in the extraction of resources. Fourth, lumber producing countries should develop an adequate and effective land-use policy. Such a policy should classify land according to its food production capability, watershed value, aesthetic value, wildlife considerations, as well as on the basis of technological suitability. Certain forest areas can only support a highly generalized subsistence activity, for instance that of the Batak, without causing any ecological disintegration. And fifth, a more intensified family planning program for the lowland population to reduce the increasing population pressure from this area should be continuously implemented.

Research Support

The model just outlined should take into account the following research priorities:

(1) Extensive and intensive inventory of marginal agriculturalists' capabilities, natural resources, skills, and tools. Their extensive knowledge about plant and animal use should be explored and recorded as well as their traditional customs and heritage before they get lost in the process of change. Appell aptly puts it this way:

> The point is that Westernized man never seems to have learned his lesson, and therefore he is doomed to constantly repeat it, while at the same time his teachers are rapidly becoming extinct. We frequently resist the knowledge of less advanced peoples, incorporating it informally into our own culture only centuries after it was first presented; in other instances we reject it outright only to rediscover it later by our "scientific" techniques . . . .
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> But in the majority of instances; Westernized man and his new industrial society destroy the indigenous books of knowledge, casting aside the potential contributions to the knowledge of all mankind as being superstitions and evidence of "primitive" mentality. We do not systematically attempt to collect this knowledge before it is lost, before the indigenous peoples lose their culture and become articulated to the modern world . . . . We are now finding a new form of colonialism, a decentralized colonialism, sometimes practiced by the Western-educated elites of Third World countries who view their less economically developed countrymen as illiterate savages . . . . (1975: 36)

(2) Intensive research on non-conventional food (which these people are presently subsisting on) should be done to determine the potential of these items for domestication and improvement. These data will also be useful for lowland populations with their own food plight.

(3) More intensive research on the understanding of the ecological requirements for normal growth of commercial forest products such as wild resins, rattan, and wild honey should be undertaken. This

information can identify the possibility of their domestication in marginal uplands. More than half of the total land area in Asia and the Pacific is hilly and is more adapted to agroforestry.

These objectives are easier said than done, of course. Taking an unpopular course is a lonely job. But we have the commitment. Lester Brown in his book, Building a Sustainable Society, concludes:

> Achieving a sustainable society will not be possible without a massive reordering of priorities. This in turn depends on political action by individuals and by public interest groups, much of it may come from the bottom rather than the top. If we fail, it will not be because we did not know what needed to be done. Unlike the Mayas, we know what must be done. What we will soon discover is whether we have the vision and the will to do it. (1981: 372)

APPENDIX A--TABLES FROM TEXT

Table A-1. Soil Fertility Condition of Batak Farms Situated at the SLOPE by Length of Fallow Period (Summer, 1981)

Length of Fallow of Swidden Fields	Number of Sample Swidden Plots	Number of Sample Quadrats Taken	Level of Alkalinity of Soil (PH)	Macro Soil Nutrients[a]			Micro Soil Nutrients[a]			
				Organic Matter (Percent)	Pospho- rous (PPM)	Potas- sium (PPM)	Copper (PPM)	Zinc (PPM)	Iron (PPM)	Manganese (PPM)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
STANDARD[b]	4	16	5.6	3.8	16.0	453.2	.48	2.31	23.5	7.7
Seven Years	4	12	3.7	2.9	15.3	634.7	.89	.93	20.3	3.5
10 Years	4	12	4.1	2.9	13.0	338.7	.17	.35	21.4	1.9
11 Years	4	12	4.1	2.2	11.3	242.7	.57	.93	18.8	3.6
15 Years	4	12	4.8	3.0	22.7	705.3	.28	1.90	10.7	5.1
All Fallowed Fields	16	48	4.2	2.8	15.6	480.4	.48	1.00	17.8	3.5

[a]Analysis conducted by Soil Fertility Section, Regional Laboratory, Bureau of Soils, Region 4, Manila. Analysis started 25 May 1981 and completed 1 July 1981.

[b]Soil samples from swidden sites made from virgin forest (4 fields) and from uncut virgin forests were taken. Eight sample quadrats were randomly drawn from the swidden fields and another eight from the uncut virgin forest. Means from these samples were computed and are used here as our standard figure.

Table A-2. Soil Fertility Condition of Batak Farms Situated at the VALLEY by Length of Fallow Period (Summer, 1981)

Length of Fallow of Swidden Fields (1)	Number of Sample Swidden Plots (2)	Number of Sample Quadrats Taken (3)	Level of Alkalinity of Soil (PH) (4)	Macro Soil Nutrients[a] Organic Matter (Percent) (5)	Pospho-rous (PPM) (6)	Potas-sium (PPM) (7)	Micro Soil Nutrients[a] Copper (PPM) (8)	Zinc (PPM) (9)	Iron (PPM) (10)	Manganese (PPM) (11)
STANDARD[b]	4	16	5.5	3.8	16.0	500.0	.53	1.9	31.0	7.4
Seven Years	4	12	4.3	1.6	13.7	449.3	.39	.61	21.5	4.8
10 Years	4	12	4.1	2.6	13.3	268.0	1.28	1.06	29.2	2.9
11 Years	4	12	5.0	1.7	14.0	420.0	.90	.89	24.6	5.1
15 Years	4	12	5.4	3.0	20.3	597.3	.59	2.30	36.4	8.4
All Fallowed Fields	16	48	4.7	2.2	15.3	433.7	.79	1.2	27.9	5.3

[a]Analysis conducted by Soil Fertility Section, Regional Laboratory, Bureau of Soils, Region 4, Manila. Analysis started 25 May 1981 and completed 1 July 1981.

[b]Soil samples from swidden sites made from virgin forest (4 fields) and from uncut virgin forests were taken. Eight sample quadrats were randomly drawn from the swidden fields and another eight from the uncut virgin forest. Means from these samples were computed and are used here as our standard figure.

Table A-3. Soil Fertility Condition of Batak Farms Situated at HILLTOP By Length of Fallow Period (Summer, 1981)

Length of Fallow of Swidden Fields	Number of Sample Swidden Plots	Number of Sample Quadrats Taken	Level of Alkalinity of Soil (PH)	Macro Soil Nutrients [a]			Micro Soil Nutrients [a]			
				Organic Matter (Percent)	Pospho-rous (PPM)	Potas-sium (PPM)	Copper (PPM)	Zinc (PPM)	Iron (PPM)	Manganese (PPM)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
STANDARD[b]	4	16	5.5	3.0	11.7	410.7	.46	1.7	26.5	7.9
Seven Years	4	12	4.1	2.9	12.0	306.7	.24	.46	17.5	1.8
10 Years	4	12	3.6	3.4	15.0	384.0	.11	.36	34.13	4.1
11 Years	4	12	4.1	2.3	14.7	278.7	.36	.87	16.4	3.5
15 Years	4	12	4.3	2.5	13.7	310.7	.49	1.02	14.5	4.2
All Fallowed Fields	16	48	4.0	2.8	13.9	320.0	.30	.68	20.6	3.4

[a]Analysis conducted by Soil Fertility Section, Regional Laboratory, Bureau of Soils, Region 4, Manila. Analysis started 25 May 1981 and completed 1 July 1981.

[b]Soil samples from swidden sites made from virgin forest (4 fields) and from uncut virgin forests were taken. Eight sample quadrats were randomly drawn from the swidden fields and another eight from the uncut virgin forest. Means from these samples were computed and are used here as our standard figures.

Table A-4

Sex Composition of the Batak Population
By Age Groups (1980)

Age Groups (1)	Male (%) (2)	Female (%) (3)	Total Population (%)[a] (4)
Below 5	3.17	1.79	2.52
5 - 9	11.11	11.61	11.34
10 - 14	10.32	10.71	10.50
15 - 19	10.32	9.82	10.08
20 - 24	9.52	8.93	9.24
25 - 29	8.73	8.93	8.82
30 - 34	8.73	8.04	8.40
35 - 39	7.14	7.14	7.15
40 - 44	6.35	7.14	6.72
45 - 49	5.56	6.25	5.88
50 - 54	5.56	6.25	5.88
55 - 59	4.76	5.36	5.05
60 - 64	4.76	4.46	4.63
65 +	3.97	3.57	3.79
All Age Groups	100.00 (126)	100.00 (112)	100.00 (238)

[a]Data taken from only four Batak major villages: Lipsu, Kalakuasan, Langogan, Tagnipa.

Table A-5

Mean Age at Menarche of Women and Mean Age at First Marriage of Men and Women by Birth Cohort (1980)

Birth Cohorts	WIVES			HUSBANDS	
	Number	Mean Age at Menarche	Mean Age at First Marriage	Number	Mean Age at First Marriage
(1)	(2)	(3)	(4)	(5)	(6)
1960-1969	9	15.8	12.0	5	18.8
1950-1959	19	15.8	13.6	16	20.5
1940-1949	15	15.5	16.2	17	18.8
1930-1939	10	15.3	17.2	11	20.9
1929 and earlier	9	14.5	16.2	13	21.2
All Birth Cohorts	62	15.4	15.1	62	19.9

Table A-6

Marital Experiences of Men and Women Aged 10 and Older by Age Cohort (1980)

Age Groups of Men and Women		Number of Marriage Experiences				TOTAL
		None	Once	Twice	Thrice or More	
(1)		(2)	(3)	(4)	(5)	(6)
All Age Groups (10 - 60+)	Male	29 (28.65)	43 (39.81)	28 (25.93)	8 (7.41)	108 (100.0)
	Female	15 (15.46)	36 (37.11)	33 (34.02)	13 (13.41)	97 (100.0)
10 - 19	Male	21 (80.77)	5 (19.23)	-	-	26 (100.0)
	Female	14 (60.87)	9 (39.13)	-	-	23 (100.0)
20 - 29	Male	6 (26.09)	14 (60.87)	3 (13.04)	-	23 (100.0)
	Female	1 (5.00)	12 (60.00)	7 (35.00)	-	20 (100.0)
30-39	Male	1 (5.00)	10 (50.00)	5 (25.00)	4 (20.00)	20 (100.0)
	Female	-	8 (47.06)	6 (35.29)	3 (17.65)	17 (100.0)
40-49	Male	1 (6.67)	7 (46.66)	4 (26.67)	3 (20.00)	15 (100.0)
	Female	-	4 (26.67)	8 (53.33)	3 (20.00)	15 (100.0)
50-59	Male	-	6 (46.15)	6 (46.15)	1 (7.70)	13 (100.0)
	Female	-	3 (23.08	7 (53.85)	3 (23.07)	13 (100.0)

Table A-6 (continued) Marital Experiences of Men and Women Aged 10 and Older by Age Cohort (1980)

Age Groups of Men and Women		Number of Marriage Experiences				TOTAL
		None	Once	Twice	Thrice or More	
(1)		(2)	(3)	(4)	(5)	(6)
60 +	Male	-	-	9 (81.82)	2 (18.18)	11 (100.0)
	Female	-	-	5 (55.56)	4 (44.44)	9 (100.0)

Table A-7. Number of Children Ever Born to Women Under Different Number of Marital Experience by Length of Time Living Together with Husband (1980)

Length of Time Living Together with Husband (in Years)[a]	Ever Married Women with Their Husbands Present					
	All Ever Married Women			Women Married Once		
	Number of Women	Children Ever Born		Number of Women	Children Ever Born	
		Number of Births	Average Number Ever Born Per Woman		Number of Births	Average Number Ever Born Per Woman
(1)	(2)	(3)	(4)	(5)	(6)	(7)
All Time Groups	73	179	2.45	36	101	3.00
Less than 5	7	10	1.43	7	10	1.43
5 - 9	10	21	2.10	6	12	2.00
10 - 14	12	31	2.58	7	16	2.29
15 - 19	9	24	2.67	3	7	2.33
20 - 24	8	26	3.25	3	12	4.00
25 - 29	9	35	3.89	4	18	4.50
30 - 34	9	36	4.00	3	14	4.67
35 - 39	6	24	4.00	3	12	4.00
40+	3	12	4.00	0	-	-

[a]Adjustments made for interval between marriages for women having multiple serial marriage.

Table A-7 (continued) Number of Children Ever Born to Women Under Different Number of Marital Experience by Length of Time Living Together with Husband (1980)

Length of Time Living Together with Husband (in Years)[a]	Ever Married Women with Their Husbands Present					
	Women Married Twice			Women Married Three Times or More		
	Number of Women	Children Ever Born		Number of Women	Children Ever Born	
		Number of Births	Average Number Ever Born Per Woman		Number of Births	Average Number Ever Born Per Woman
(1)	(8)	(9)	(10)	(11)	(12)	(13)
All Time Groups	28	106	3.36	9	12	1.33
Less than 5	0	-	-	0	-	-
5 - 9	3	9	3.00	1	0	-
10 - 14	4	15	3.75	1	0	-
15 - 19	5	17	3.40	1	0	-
20 - 24	4	13	3.50	1	1	1.00
25 - 29	4	16	4.00	1	1	1.00
30 - 34	4	18	4.50	2	4	2.00
35 - 39	2	9	4.50	1	3	3.00
40+	2	9	4.50	1	3	3.00

[a]Adjustments made for interval between marriages for women having multiple serial marriage.

Table A-8. Age-Specific Marital Fertility Rates and Indices of Mean Fertility Rates of Batak and "Natural" Fertility Schedules by Age Cohorts of Mothers

Age Cohorts	Batak Fertility Schedule		"Natural" Fertility Schedule[a]	
	Age-Specific Marital Fertility Rates	Indices of Mean Fertility Rates	Age-Specific Marital Fertility Rates	Indices of Mean Fertility Rates
(1)	(2)	(3)	(4)	(5)
20 - 29	.400	1	.421	1
30 - 39	.315	.788	.335	.795
40 - 49	.040	.100	.086	.205

[a]Taken from Henry's (1961: 84) natural fertility schedule of 13 groups of sample women from different parts of the world where birth control is not practiced.

Table A-9

Mean Birth Intervals (in Months) of Batak Mothers Compared with Those of the Metropolitan, Other Urban, and Rural Mothers of the Philippines in the 1970s By Birth Order

Birth Order	Batak Population	Other Philippine Population Groups[a]		
		Metropolitan	Other Urban	Rural
(1)	(2)	(3)	(4)	(5)
1[b]	15.03[c]	*	*	*
2	33.9	21.6	23.1	22.6
3	50.0	32.0	25.3	25.2
4	40.4	35.2	26.6	26.7
5	40.3	31.0	27.7	27.4

[a]Data were collected between 1971 and 1976 (Rindfuss and Bumpass 1979: 2; 29).

[b]This is the interval between marriage and the first birth.

[c]The practice of pre-marital sex must have caused this rather short birth interval between marriage and the first birth.

*Not computed.

Table A-10. Male and Female Infant Mortality Rates for 1961 to 1980 Births by Birth Cohort (1980)

Birth Cohorts	BIRTHS			MALE DEATHS				FEMALE DEATHS			
				0 - 3 Weeks Old		4 - 51 Weeks Old		0 - 3 Weeks Old		4 - 51 Weeks Old	
	Total	Male	Female	No.	Neo-Natal Mortality Rate	No.	Post-Natal Mortality Rate	No.	Neo-Natal Mortality Rate	No.	Post-Natal Mortality Rate
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
All Birth Cohorts	150	83	67	24	289.16	17	204.82	23	343.28	14	208.96
1975-80	40	25	16	8	320.00	5	200.00	6	375.00	3	187.50
1970-74	50	28	21	8	285.71	6	214.29	7	333.33	4	190.48
1965-69	38	18	20	4	222.22	4	222.22	7	350.00	4	200.00
1961-64	22	12	10	4	333.33	2	166.67	3	300.00	3	300.00

Table A-10 (continued) Male and Female Infant Mortality Rates for 1961 to 1980 Births by Birth Cohort (1980)

Birth Cohorts	DEATHS TO BOTH SEXES						SURVIVAL RATES BEYOND INFANCY[a]		
	0 - 3 Weeks Old		4 - 51 Weeks Old		0 - 51 Weeks Old				
	No.	Neo-Natal Mortality Rate	No.	Post-Natal Mortality Rate	No.	Infant Mortality Rate	Male	Female	Both Sexes
(1)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
All Birth Cohorts	47	313.33	31	206.67	78	520.00	506.02	447.76	480.00
1975-80	14	350.00	8	200.00	22	550.00	480.00	437.50	450.00
1970-74	15	300.00	10	200.00	25	500.00	500.00	523.81	500.00
1965-69	11	289.47	8	210.53	19	500.00	444.44	550.00	500.00
1961-64	7	318.17	5	227.27	12	545.45	500.00	600.00	454.55

[a]Births surviving after the first birthday.

Table A-11

Estimated Proportion of the Caloric Contribution of a Particular Food Source to the Total Household Caloric Production During Three Different Time Periods

Types of Caloric Source (1)	Harvest Season (August-Sept.) (2)	Post-Harvest (Oct.-Jan.) (3)	Pre-Harvest (Feb.-July) (4)
Swidden Rice[a]	95.09	86.77	*
Wage Labor	0	.33[b]	10.74[b]
Fish	.13	.23	6.13
Hunted Meat	2.18	1.24	2.45
Subsistence Forest[c] Products	2.60	3.74	18.72
Commercial Forest Products	0	7.69[b]	61.96[b]
All Sources[d]	100.00	100.00	100.00

[a]Swidden rice production was measured by weighing the quantity of rice that a sample household harvested and brought into the household in a week's contact during the harvest season. In the harvest season, the timing of the household contact was synchronized with their harvesting week. In the post-harvest period, the swidden rice was measured by taking into account the amount of swidden rice available for consumption in that particular week of contact. Unlike the other food products, this staple is being cropped once-a-year. There was no problem with identifying swidden from bought rice since the latter is always husked and well polished unlike the first. Unhusked rice was weighed and the total weight was multiplied by the rice cereal recovery rate of .8 (this is the mean computed from five different series of tests I personally did using their local rice and husking it with the use of their own mortar and pestle). Production from other sources was taken directly from the production data collected for each sample household during the one-week contact every other month. Raw weight of various food types was multiplied by their respective IFU value (see Chapter II). To get their caloric value, the FNRI (1980) caloric table for Philippine foods was used.

[b]Around 95 percent of the total cash derived from wage labor and the collection of commercial forest products is used to purchase rice cereal.

[c]Subsistence forest products include fruits, vegetables and tubers. In the harvest and post-harvest seasons, wild tubers are not usually collected. They are eaten only during the pre-harvest period which accounts for the upward swing in the proportion of its contribution during this time.

[d]Food derived from occasional government relief operations and from the tourists do not provide substantial contributions to total food production.

*For most households during these months only seed rice for the next planting season is left. The excess after planting is consumed but its contribution to the total caloric production during these months is nil. In 1980, there was only one household (C IV-1) that had 50 kilograms of husked rice set aside for consumption. This was shared with the household's three married children who in turn shared with the household their food produced from collecting commercial forest products.

Table A-12

Interhousehold Food Sharing Indices
by Types of Caloric Sources

Types of Caloric Source	Index of Interhousehold[a] Food Sharing
(1)	(2)
Swidden Fields	.10
Cash Derived from Commercial Forest Products	.02
Subsistence Forest Products	.19
Hunted Food	.30
Fished Food	.20

[a]This is computed as the average of the ratio between the calories produced and given out; and the ratio between the calories produced and received by a household.

Table A-13

Estimated Percentage Distribution of the Amount of Food Received and Given Out by EGO's Household Classified By Mean Distance Between EGO's and Food Giver and Receiver's Household

Distance (in Kilometers) (1)	Caloric Reciprocity Given Out (Percent) (2)	Caloric Reciprocity Received (Percent) (3)
0 to .90	51	52
1 to 1.90	33	33
2 kilometers and farther	16	15
All Distances	100	100

Table A-14

Estimated Mean Geographical Distance Between Transacting Households During Two Different Time Periods By Types of Households Involved

Households Involved (1)	Period of Relative Abundance (in Kilometers) (2)	Period of Relative Scarcity (in Kilometers) (3)
Food Giver and Ego's Household	2.0	.9
Food Receiver and Ego's Household	1.9	.5

APPENDIX B

"NATURAL" AND "CONTROLLED" FERTILITY CONCEPTS DISTINGUISHED

L. Henry (1961: 81) describes the two concepts in the following manner:

> We can term as natural the fertility which exists or has existed in the absence of deliberate birth control. The adjective "natural" is admittedly not ideal but we prefer it to "physiological" since the factors affecting natural fertility are not solely physiological: social factors may also play a part--sexual taboos, for example, during lactation. Some of these factors may result in a reduction of fertility but this cannot be considered a form of birth control. Control can be said to exist when the behavior of the couple is bound to the number of children already born and is modified when this number reaches the maximum which the couple does not want to exceed; it is not the case for a taboo concerning lactation, which is independent of the number of children already born. (1961: 81)

L. Henry (1961) selected thirteen societies around the world which are known to have not controlled birth at all and restricted his study to the:

> . . . fertility of women who have formed a union which is stable enough for them to be considered as exposed to the same risk as married women. Moreover, the age of the woman has to be taken into account as that also plays an important part . . . , rates for legitimate births by age or age group must be formulated. (Henry 1961: 82)

His work yielded a table of what he calls "age-specific female legitimate fertility rates" (Henry 1961: 84). From this age-specific fertility schedule he proceeded to establish what he calls the "indices of mean fertility rates" which are the ratios of the age-specific legitimate fertility rates to the ratio at ages 20-29 or 20-25 if one decides to use a five-year interval. He uses this age bracket as the mean age since fertility by this time is least affected by the age at marriage of a woman, and hence stable.

By using Henry's data on the "natural fertility" schedule, Knodel (1977: 221) compares the curve of the indices of mean fertility rates of "natural fertility," using it as the standard, for a "controlled fertility" population. He says:

> If fertility declines with age in the same way as in the standard natural fertility schedule the ratio of the two indices should be 1.00 at all ages. (At ages 20-24, of course, the ratio for any schedule will always be 1.00). Values below unity indicate that for that age the schedule under consideration shows lower fertility relative to ages 20-24, than in the standard natural-fertility schedule. For populations experiencing natural fertility, the ratios of the index values should remain close to unity at all ages; for populations with controlled fertility the ratio of the indices should fall progressively below unity with increasing age, since larger proportions of couples will have reached or exceeded their desired number of children at successive ages, and hence be highly motivated effectively to prevent further births. (1977: 221)

By plotting the fertility curve of the United States (1960), Sweden (1961-1965), and Bulgaria (1968) populations which Knodel (1977: 222) used as "controlled fertility" population against Henry's "natural fertility" schedule, the curve of the former takes a concave shape, while that of the latter is convex.

APPENDIX C

BATAK SWIDDEN AGRICULTURE

The major agricultural product of the Batak is rice, produced in swidden fields. Usually by pooling labor from various households, a household on the average clears around one-third of a hectare for a swidden plot.

In August, 1980, I randomly drew ten sample quadrats from each of the ten sample swidden plots. Two field characteristics were controlled in choosing a swidden sample, level of adequacy of maintenance such as weeding and the length of fallow. Terrain was not considered since they were all practically the same. From all the sample quadrats (each quadrat had an area of one square meter), I harvested the rice myself, threshed, dried, and pounded it using their own pestle and mortar. The results are shown in Tables C-1, C-2, and C-3.

On the average, a one-hectare swidden field under various levels of field maintenance produces around 3,900 kilograms of husked rice. A field with excellent maintenance (weeds completely removed) produces almost 5,000 kilograms while a moderately maintained one (between 30 to 50 percent of the field weeded) produces around 4,000 kilograms. A very poorly maintained field (below 30 percent of the field weeded) makes around 2,000 kilograms.

The data suggest that one of the critical factors for a high yield after planting is maintenance (also see Cadelina 1978; 1979; Ashby and Pfeiffer 1965). Maintenance demands an accurate scheduling

Table C-1. Production Estimates of One Square Meter Quadrat of 10 Sample Swidden Plots Classified by Level of Field Maintenance

Level of Field Maintenance	Swidden Sample Plot	Length of Fallow (in Years)	Area of Quadrat (Meter)	Number of Trials	Unhusked Rice with Chaff Removed (Grams)	Husked Rice (Grams)	Recovery Rate (Col. 7/ Col. 6)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Excellent	Sample 1	VF*	1	10	560	505	.90
	Sample 2	20	1	10	550	497	.90
	Sample 3	13	1	10	543	494	.90
	Sample 4	15	1	10	540	498	.92
Moderate	Sample 1	VF*	1	10	500	445	.89
	Sample 2	10	1	10	494	435	.88
	Sample 3	7	1	10	498	438	.88
Very Poor	Sample 1	VF*	1	10	262	228	.87
	Sample 2	9	1	10	260	213	.82
	Sample 3	10	1	10	265	230	.87

*Cut from Virgin Forest.

Table C-2

Mean Production Estimates Per Hectare Classified by Level of Field Maintenance

Level of Field Maintenance	Husked Rice		Unhusked Rice (Cavan)	Cereal Recovery Rate (Col. 3 / Col. 4)
	Kilogram	Cavan*		
(1)	(2)	(3)	(4)	(5)
Excellent	5,000	89	97	.92
Moderate	4,000	71	81	.88
Very Poor	2,000	36	42	.86
All Fields	3,600	65	73	.89

*One cavan is equal to 56.25 kilograms. One cavan is also equal to 25 gantas.

for weeding since the stages of rice growth are rather short. Batak rice variety ripens between 110 to 120 days.

My study in 1976-1977 among the Bukidnon in Southern Negros, Philippines had shown that there is a kind of a threshold for the area of a swidden plot that the Bukidnon can cultivate, but beyond this size, production begins to decline (Cadelina 1978). This is caused by their inability to provide sufficient labor to weed during the critical stage of rice growth. After planting, each household has to maintain its own field using its own labor force. Absence of that labor at a particular phase could mean losing 50 percent of the field's potential production (see Table C-3).

If a Batak maintains his field efficiently, he can produce around 90 cavans of husked rice per hectare, just as high as most of the lowland farmers' levels whose labor and capital intensive irrigated fields require fertilizer and pesticides, for the commonly known high yielding (HY) rice variety. The Batak with only an ax, a bolo, forest to shift around fields, and of course a relatively full-time household labor force compare well with our modern farmers.

The data do not, however, necessarily romanticize the Batak situation. Actual household production is not really high. As said earlier, a Batak kaingin field is only one-third of a hectare, on the average. Other uncontrolled conditions such as rodent and wild pig (among other predators) predation may wipe out a ripening rice field overnight. Illness may also keep household members from attending to their fields.

Table C-3

Estimates of Yield Decline of Swidden Fields Classified by Decline in Levels of Field Maintenance

Decline in Levels of Field Maintenance	Decline in Production	
	Absolute Quantity* (in Kilograms) Per Hectare	In Percentage Per Hectare
(1)	(2)	(3)
From Excellent to Moderate Field Maintenance	592	12
From Moderate to Very Poor Level of Field Maintenance	2,156	49
From Excellent to Very Poor Level of Field Maintenance	2,748	55

*Husked rice.

APPENDIX D

COLLECTING COMMERCIAL FOREST PRODUCTS

There are four main forest products which are in high commercial demand--wild resins (Manila copal), rattan, wild honey, and orchids. Due to the higher price offered for Manila copal in Borneo, it is estimated that around 30 percent of the total annual production in Palawan is sold there by the traders.[1] Most recent data indicate that annually around 450,000 kilograms of Manila copal and 150,000 linear meters of rattan are reported to have been shipped to Manila.[2] All of the Manila copal is shipped out of the Province while only 80 percent of the rattan is. The rest of the rattan is consumed locally.

Part of the wild honey is generally consumed locally but a substantial amount is shipped to Manila. It is seldom declared in the Philippine Port Authority in Palawan, indicating illegal shipment. The figure for wild honey is therefore extremely underreported. From April to July, 1980, I recorded 500 kilograms of honey sold to the agents just in my one village of study. From January to May, 1981, I recorded 800 kilograms in the same village. The yearly honey production of the Batak in this village alone must be in the vicinity of 1,000 kilograms. If we multiply this with the number of other population groups and communities collecting wild honey in the Province, the volume is

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[1]This is a modest estimate from the Palawan Economic Development Council (PEDC) in 1980 (personal communication with PEDC Office).

[2]Data provided by the Bureau of Forestry Development and the Philippine Port Authority, Puerto Princesa City.

Table D-1. Production Efficiency Ratio Estimates by Type of Commercial Forest Products

Types of Commerical Forest Products	Calories[a] to be Produced	Calories[b] Spent for Traveling Without Load	Provision[c] Necessary to Collect in 24 Hrs. (Calories)	Calories[b] Spent for Collecting	Calories[b] Spent for Traveling with Load	Total Caloric Expenditure (Cols. 3 + 4 + 5 + 6)	Production Efficiency Ratio (Col. 2 / Col. 7)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Almaciga	38,112	1,386	4,110	4,320	2,794	12,611	3
Rattan	38,112	1,386	4,110	3,695	2,329	11,520	3
Wild Honey	38,112	462	0[d]	690	159	1,310	29

[a]Calories from a 30 peso worth of rice. One ganta (2.25 kilograms) of rice costs six pesos and 50 centavos.

[b]Computed from tables of energy cost of man-work (see Altman and Dittmer 1968: 355-57)

[c]Normally, a person brings half ganta of rice cereal for provision which is equivalent to 1.12 kilograms.

[d]No food provision is necessary when one collects it. Traveling and collecting only last, at most, three hours.

substantial. Honey is bought right in the area between five to six pesos per kilogram, while rattan at 10 pesos per 100-strip bundle. Almaciga is bought one perso per kilogram while orchid is two pesos per plant.

Wild honey is seasonal and it is only available during the summer months (it may be available at low level in December). It reaches its peak in March to May, declines until it disappears in the last week of July. During these months more efforts are spent in looking for honey since it is more profitable than taking the other commercial forest products. Energy-time expenditure and total caloric production ratio is higher than when they collect rattan or almaciga (see Table D-1).

Rattan is available practically all year round. Intensification or disentification of its collection depends on the outside demand usually from Manila furniture making industries. The concessioner knows exactly what he should produce as Manila demand changes from month to month. This information is then relayed to his capataz who in turn informs the Batak what to collect month by month. Twelve species of rattan are reported to have commercial importance, and the demand for each species changes.

Like rattan, almaciga trees grow in virgin forest of more than 1,000 meters elevation. The resin-like product tapped from these trees is heavy to carry and thus demands more energy compared to other commercial forest products. The product is available year round, and so is the demand for it. But the Batak slow down its collection during the height of the rainy season, May to July, due to transport problems.

Collecting Manila copal, like collecting rattan, involves a number of days. The average distance between the Batak's residential area and the collecting site is more or less a three-hour hike. A household head therefore has to be away from home for at least two days. He needs food provisions for himself collecting in the forest and for his own family at home. He, therefore, needs cash or cereal in advance to meet these needs. This is the catch: once the Batak starts collecting commercial forest products, he is bound to the rules of the system. He needs a loan to start with and most often, he does not collect enough in one trip to pay back, thus putting him in constant debt. In this manner, the capataz is assured of regular delivery and of his commission which depends on the volume of the product turned in to the concessioner.

Orchids, on the contrary, no longer contribute much to the total caloric production from commercial forest products. This product is getting extremely rare, consequently its collection is no longer organized.[3] Most of those sold are found accidentally during forest trips when searching for other forest products.[4]

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[3]Legal restrictions on the collection of these endangered plants also has reduced the Batak's interest in collecting them.

[4]When a Batak travels for a specific purpose, he anticipates that other food items can be encountered along the way, thus he keeps looking around when traveling, especially in the forest. To a casual observer, however, this seems to show lack of direction or goal. Therefore, the Batak claim, daytime travel takes longer than night travel. During the latter time, looking for food products along the way is not advisable because of the darkness.

APPENDIX E

COLLECTING SUBSISTENCE FOREST PRODUCTS

Subsistence forest products consist of vegetables, carbohydrate food, and fruits. Twenty different species of fruit trees are reported. Since their fruiting seasons differ, a limited supply of ripe fruit (also see Eder 1978: 58) is available practically thoughout the year, and in the months of July to October there is an extraordinarily good supply of balisangkad, a wild variety of the domesticated rambutan (Nephelium lappaceum Linn.) common in Malaysia and Mindanao in the Philippines. The fruit is fleshy with an edible nutty seed. It has the following nutritional content:[1] crude fat value of 43.37 percent, crude protein of 2.97 percent, and a total carbohydrate digestible part of 17.98 percent.

Wild vegetables are numerous, ranging from the edible palm tree tips (ten different species of these trees were reported), to leafy ones (nine species). Most of these products are avaiable the whole year round, wild bracket fungi (consisting of three species) and mushrooms (consisting of four species) are abundant only in the months of July to September after the rainy season has reached its peak in June. These add to the total vegetable repertoire of the Batak.

Wild tubers provide carbohydrates. Four species grow but only two are commonly consumed, the abagan (Dioscorea luzunensis Schauer) and

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[1]A 200-gram balisangkad fruit was analyzed at the Chemistry Laboratory of Silliman University, Dumaguete City, Philippines.

kurot (Dioscorea hispida Dennst.). They are all collectible during the summer months (for more discussion on these tubers, see Eder 1978).

Most (estimated to be around 80 percent) of the subsistence forest products are collected by women with the help of their younger children and teen-aged daughters. A number of adult women may go out as a group to collect, although each one brings home what she has collected. In cases, however, where one of them is unlucky and finds nothing, the finders share with her. When certain products are extraordinarily plentiful or when there is an emergency need for a particular product, and when men are not busy, they may join the women in collecting.

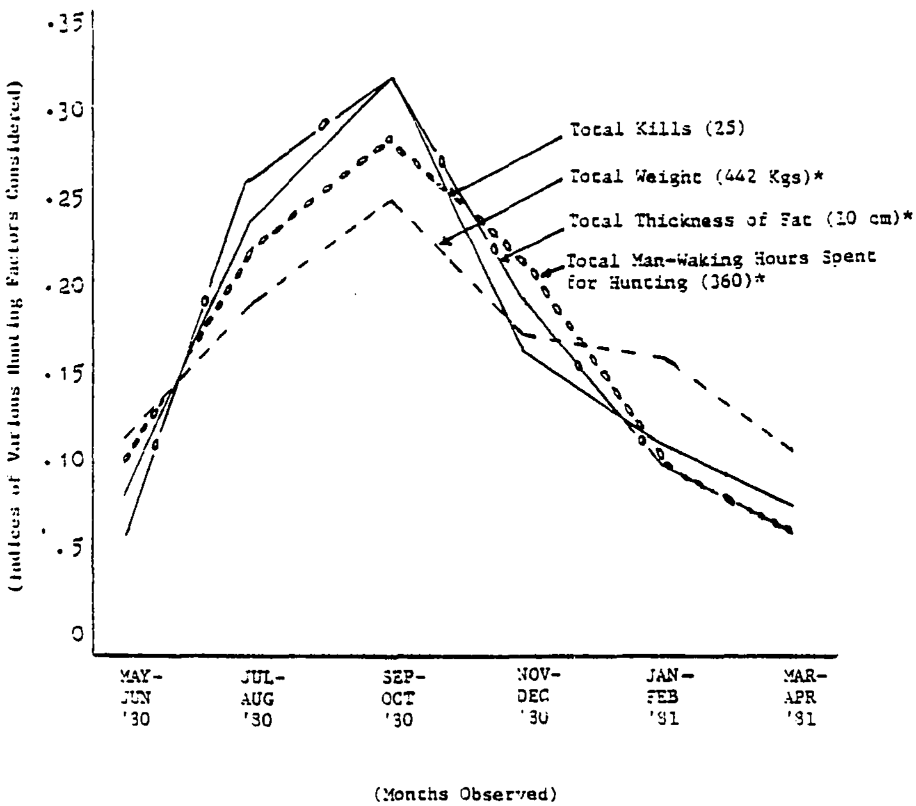
APPENDIX F

HUNTING

Hunting is focused on one major game animal, wild pig. It is caught either by using a locally-made muzzle-loaded rifle (paltik) or by chasing using hunting dogs and spears. Hunting by rifle can be done either alone (manggarut) or in groups, while chasing is usually done by groups. A ritualized collective hunting participated in by the whole village population is disappearing. This is locally known as sagbay (see Venturello 1907:554). Formerly, this was regularly done every year. Today, this is rarely done. I was lucky to observe and participate in three sagbay trips in September, 1980. This was the first sagbay since 1970, they reported.

Hunting may also involve minor game. These are caught by trap, by smoking them out from their holes, or with the use of the blow-gun or bow-and-arrow. Hunting for this purpose is never planned or organized Game are caught whenever they are encountered or when circumstances allow. Minor game consist of birds, reptiles, and mammals. Fourteen species are reported.

The intensification of hunting wild pig is determined by the objective evaluation of the situation. In the month of July, hunting intensity rises until it reaches its peak in September and October (see figure below). These are the fruiting months of the balinsangkad trees and the harvesting season of the swidden ricefields. Since food is abundant during these months, wild pigs are fattest at this time. Consequently the Batak's desire for this meat increases in contrast to



*Sum of the bi-monthly mean.

Comparison of Trends of Factors Involved in Wild Pig Hunting Complex other months when wild pig meat is not so desirable, they claimed. The tarakabut harvest requiring men to hunt this time also increases the hunting effort.

There is empirical evidence to support their claims that meat is most desirable during these months. From May, 1980 to April, 1981, I recorded their monthly catch and took the weight of each catch. The data show that the mean weight per catch starts rising in the month of July and reaches its peak in the months of September and October. The thickness of the fat also follows the same pattern.

If we compare the intensity curve of hunting with the mean weight and fat thickness curves on a bi-monthly basis, their pattern is similar as we can see from the above figure. Hunting is organized to coincide with the favorable circumstances affecting the whole hunting complex. The net effect is a conservation strategy which requires hunting to slow down when the quantity and quality of meat return per catch is at its lowest thus keeping stock supply in reserve until the next season when the meat is at its best. Whether the people can see the logic in this is another story.

APPENDIX G

FISHING

Unlike hunting, fishing is largely done by women. Men very infrequently do spear fishing and "overnight" hook-and-line fishing.

Three products are obtained: fish, crustaceans, and mollusks or shellfish. Fish are largely caught by hook-and-line and trap; crustaceans, essentially by trap; while mollusks are simply collected from the river bed in the early part of the evening using a torch made from wild resin (for illuminating purposes). This is the most profitable time to collect since fresh-water shellfish and snails come out of their burrows. They go out in the evening to feed and "hide" (burrow) during the day, the Batak reported. It is not impossible, however, to collect mollusks during the day, but the return per unit of time spent is less compared to when the collection is done in the evening as you will notice in Table G-1.

Evening collection, however, can be done only if the household has a ready supply of wild resin for a torch. Others which do not have a torch ask from those who have; a form of food sharing in an indirect fashion.

Table G-1

Efficiency Ratio of Collecting Mollusks
Classified by Periods of Collecting

Collecting Period (1)	Number of Trips Recorded (2)	Mean Number of Man-Hour Spent (3)	Mean Weight of Mollusks Collected (Kilogram) (4)	Efficiency Ratio (Col. 4 / Col. 3) (5)
Nighttime	15	2	6	3
Daytime	8	3	3	1

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