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Steps Toward A Coherent Policy for Andean Peasant Agriculture

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Steps Toward A Coherent Policy for Andean Peasant Agriculture

by

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TABLE OF CONTENTS

	Page
Introduction	1
Patchy Environment-Patchy Results	6
Peasant Family Farms and Communities	9
Problems in Andean Agro-Pastoralism and How Peasants Adapt to Them	11
Sustainable Peasant Agriculture	19
New Problems Arising from Population Growth and Commercial Intensification	20
Negative Feedback	23
Positive Feedback	24
Policy Implications	26
References Cited	31

LIST OF TABLES AND DIAGRAMS

Table 1:	Rural Population in the Three Andean Countries	3
Table 2:	Growth Rates in Urban and Rural Population, 1970-75	3
Table 3:	Gross Per-Capita Income, Probability of Death between 0 and 2 Years and Life Expectancy at Birth	4
Table 4:	Probability of Infant Mortality between 0 and 2 Years, 1965-70	5
Table 5:	Probability of Infant Mortality between 0 and 2 Years by Ethnic Group of the Mother in Three Latin American Countries	5
Table 6:	Distribution of Farm Size in the Highlands of Ecuador, Peru, and Bolivia	7
Table 7:	Comunidades Campesinas in Peru	16
Table 8:	Number of Comunas and Population in Ecuador	17
Diagram 1:	Characteristics	9
Diagram 2:	Problems	12
Diagram 3:	Peasant Strategies to Cope with Problems	14
Diagram 4:	Percentage of Fields with Losses According to Two Methods of Calculation	21
Diagram 5:	Imputed and Monetary Cost Components of the Agricultural Cycle	22
Diagram 6:	New Problems Arising out of Population Growth and Intensification	24
Diagram 7:	Policy Implications	29

INTRODUCTION

This study focuses on development policies directed at the impoverished Indian peasant population that inhabits the environmentally precarious area of the Andean mountain chain, in an area that stretches from Colombia to northern Argentina and covers an estimated 80 million hectares of land at elevations greater than 2,000 meters. The area is densely populated with approximately 18 million people. The diverse tropical mountain environment in which these people live provides a precarious natural resource base in which mixed agropastoral systems have evolved and changed over time. But today much of this area is threatened with ecological degradation. Environmentally sound solutions reside in the hope of developing sustainable agriculture and livestock production systems.

Yet this situation was not always like that. One of the world's pristine civilizations developed in the Andean highlands. The wealth of the pre-hispanic civilizations rested on the domestication of plants and animals especially adapted to local conditions combined with a social organization that mobilized people for labor-intensive agricultural and pastoral practices and a remarkable political system that deployed people, resources, and armies for expansionist ventures (Murra 1956, 1975). Carl Troll (1935) has pointed out that the territorial limits of the Inca empire, the last pre-conquest state, coincided with the limits of the tropical mountains of the Andes pointing to the remarkable adaptation of this social system to the particular features of their environment.

However, four centuries of Spanish colonial rule and one and a half centuries of republican regimes have pressured native people onto marginal lands, caused their impoverishment, and politically disenfranchised them (Mörner 1985). During most of the colonial period population declined. However, since the 19th century there has been a steady increase in population.

A process of *hacienda* formation (landed estates with a resident serf-like Indian population) began to develop in the highlands in the second half of the colonial period (the 18th century), which, however, became more entrenched and widespread in the 19th and early 20th centuries of the republican era. When, in the post-war period, policy formulations directed at the Indian populations began, emancipation of the Indian serfs was considered a necessary first step in reaching out to these populations and was achieved through agrarian reform movements implemented in the three countries from 1956 to 1975. During that period peasant uprisings and political mobilizations played a role as important as the policies implemented by reformist governments prodded by international pressure.

Combined efforts to undertake development projects in the region began in the 1950s with the *Misión Andina* sponsored by the International Labour Organization and other national and international efforts that resulted from concern for providing the Andean rural populations with roads, schools, and health-care facilities through community development programs. Today basic infrastructural services such as roads, electricity, educational services, and public health infrastructure (water and sewers) -- though increasingly installed by the modern states of Ecuador, Peru, and Bolivia on a massive scale -- are still far from complete and inadequate in coverage. Though attention was also given to improving the productive capacity of highland agriculture, net family incomes and general standards of living have only improved negligibly. Introduction of modern agricultural techniques has not yet provided many visible benefits for these people, although they are increasingly being adopted.

Today the peasant populations of the Andean area continue to live in conditions of poverty, caused largely by increasing population pressure on an insufficent, diminishing, and degraded resource base and low incomes as wage earners and producers of food commodities. The rural population in Ecuador, Peru, and Bolivia increased from 12 million in 1970 to 14 million in 1980 (Table 1).

TABLE 1

Rural Population in the Three Andean Countries
(in thousands)

	1970	1975	1980
Bolivia	2,673	2,873	3,081
Ecuador	3,600	3,992	4,432
Peru	5,648	6,045	6,448
Totals	11,921	12,910	13,961

Source: CELADE, Boletín Demográfico No. 28, Julio de 1980.

Though the relative proportion of urban-to-rural population has been diminishing in the three countries, rural population is still growing in absolute numbers, except for Bolivia (Table 2).

TABLE 2

Growth Rates in Urban and Rural Population 1970-75
(in percentages)

	Total	Urban	Rural
Bolivia	2.5	4.1	-2.9
Ecuador	3.3	5.2	2.3
Peru	3.0	5.7	1.1

Source: CEPAL, 1977 (E/CEPAL/1027).

UNICEF (1979) estimates that by the year 2,000, 48.5 percent of the population in Bolivia, 45.5 percent of Ecuador's, and 23.3 percent of Peru's population will still be rural. In the next two decades neither rapid rural depopulation nor its concentration on better-endowed lands can be expected, although rural emigration and colonization into the tropical lowlands is occurring at an increasing rate. According to the World Bank (1988: 202, 274) the three countries are in the lower middle ranges of per-capita gross national product (GNP) for 1987 (Bolivia $600, Ecuador $1,160, and Peru $1,090). Growth rates in income, however, have not kept up with population expansion. Bolivia's population grew at 2.5 percent from 1965 to 1980, while its per-capita GNP diminished at a rate of -0.4 percent annually in roughly the same period (1965-1986). The figures

for Ecuador are 3.1 percent of population growth compared to 3.5 percent per-capita GNP and 2.8 percent population growth to 0.1 per-capita GNP for Peru.

Very unequal income distribution also characterizes these three countries. Comparisons with Argentina of per-capita income, probabilty of infant mortality in the first two years, and life expectancy in each country indicates the impact of this disparity (Table 3).

TABLE 3

Gross Per-Capita Income, Probability of Death between 0 and 2 Years and Life Expectancy at Birth

Country	Per-Capita Income in 1970 (US$)	Probability of Death between 0 and 2 Years per 1,000 (1966-1971)	Life Expectancy at Birth (years) (1970-75)
Bolivia	260	202	48.49
Ecuador	355	127	57.10
Peru	525	169	54.55
Argentina	1,208	58	68.19

Source: Cited in *Situación de la infancia en América Latina y El Caribe 1979* , pg. 54.

A 1979 study of poverty levels found that 68 percent of the Peruvian rural households had incomes below poverty levels (less than US $119) and 25 percent of the rural households were below the line of indigence with less than US $68 and thus incapable of covering their food budget (Altamir 1979). Comparable data for Ecuador reveal similar proportions (Luzuriaga and Zuvekas 1980). The high figure of excess of rural infant mortality over urban rates indicates the underpriviledged status of the rural populations of the three Andean republics (Table 4). An important hidden dimension of the problem of rural poverty is that a majority of the population belongs to Indian "ethnic" groups, whose status in the colonial period was relegated to that of vassals. Although the independent republics abolished these legal distinctions, the Indian groups of today continue in many ways to be second class-citizens in these countries, a fact reflected in the differential infant mortality rates between Indian and non-Indian groups (Table 5).

TABLE 4

Probability of Infant Mortality between 0 and 2 Years, 1965-70
(per 1,000)

Country	Urban	Rural	Rural "Exess Mortality"
Boliva	166	224	34.9%
Ecuador	98	145	48.0%
Peru	132	213	61.4%

Source: Behm Hugo and D. Primante "Mortalidad en los primeros años de vida en la América Latina", CELADE Notas de Población, Año VI o 16, 1978.

TABLE 5

Probability of Infant Mortality between 0 and 2 Years
By Ethnic Group of the Mother in Three Latin American Countries
(per 1000)

Country	Indian Ethnic Group	Non-Indian Groups	"Exess Mortality"
Bolivia*	258	149	73.2%
Ecuador**	197	143	37.8%
Guatemala***	173	128	35.2%

* Defined as Indian if mother is monolingual in an Indian language, defined as non-Indian when the mother is Spanish monolingual.
** Counted according to *cantones* with predominantly Indian populations in the 1950 Census.
*** Counted as Indian in the Indian Census.
Source: Cited in *Situación de la Infancia en América Latina y El Caribe* 1979, pg .140.

Official development assistance to Bolivia in per-capita dollars was $49.0 in 1986, although the equivalent figures for Peru and Ecuador remained at $15.2 and $13.7, respectively (World Bank 1988: 264). The three Andean republics and donor agencies have made a considerable effort to channel development aid to the rural populations. An example from Peru in the period 1983-84 shows that the multinational and bilateral effort at agricultural development was considerable at $1.0 billion ($400 million from bilateral sources and $800 million from multilateral programs). The government of Peru allotted $649 million toward these projects. The World Bank and the Interamerican Development Bank (IDB) invested a total of $681 million ($414

million from IBRD and $267 million from IDB). Almost 70 percent of the total donor support to the agricultural sector was directed at supporting irrigation projects, public-sector credit, and large area development projects in the high jungle region. Bilateral donors were Germany ($86 million), Spain ($73 million), and Canada ($27 million) and the US ($143 million). Among the bilateral donors, USAID had a more diverse portfolio as well as the largest investment. USAID is a pioneer in support toward land use and environmental-planning technologies, in small-scale irrigation projects in the *sierra,* in soil conservation, water and range management, support for crop research, and development and livestock technology development, that are increasingly concentrating on the *sierra* problems. Donor assistance (leaving aside $266 million for public-sector credit) projects specifically directed to highland agriculture and livestock is about 25 percent of the total contributions (Bathrick 1985).

Although improvements have been achieved, none of the depressing trends that cause these people to lag behind the rest of their respective national groups has significantly been reversed. This paper takes a fresh look at specific aspects of the problem and suggests new ways of thinking about development for this target population of thirteen million people.

PATCHY ENVIRONMENT- PATCHY RESULTS

Tropical mountain environments such as in the Andes are characterized by sharp environmental gradients. Every 100-meter difference in altitude is equivalent to a shift in 10 degrees latitude. Most of the climates on the earth can be found and are condensed in small geographic areas resulting in a veritable mosaic of specialized areas or ecotypes capable of supporting varied ecological life forms (Troll 1968). Because of this diverse natural vegetation, agriculture and animal husbandry are also very varied. For humans, diversification in the exploitation of their environments is one consequence of this patterning of nature. Another consequence is that no one ecotype is fully capable of supporting human populations by itself.

Andean farmers exploit several of these microenvironments simultaneously. A developmental constraint is that technological change also has a patchy mosaic-like impact. Thus, the advantages of economies of scale, of specialization, and the impact of a single technological innovation with a broad and rapid impact are not easily available. No one significant technological breakthrough can be expected for the Andes. Rather, solutions will come from a myriad of small improvements, each applicable to numerous but very small and isolated areas. Improved production and better welfare in the Andes is dependent on regional and microregional developments in which each component of production is gradually improved. Growth and development in this region is accretional and slow, rather than driven by a single powerful change agent or commodity (Gonzalez et al. 1987).

Posner and McPherson (1981:93) estimate that 25 percent of cultivated land in Peru and Bolivia is on steep slopes greater than 8 percent, though most cultivated slopes range far more than this, between 15 and 25 percent. About 50 percent of the farming population, living mostly on small-scale family farms, depend on steep-slope agriculture (Table 6).

TABLE 6

Distribution of Farm Size in the Highlands of Ecuador, Peru, and Boliva (in percentages)

Country	With Less than 1 Has.	With 1-5 Has.	With greater than 5 Has.
Ecuador	35	43	22
Peru	37-47	16	21*
Bolivia	17	42	41

Source: Posner and McPherson (1981), Table 4, pg. 97.
* Caballero (1981), Table 12, pg. 99.

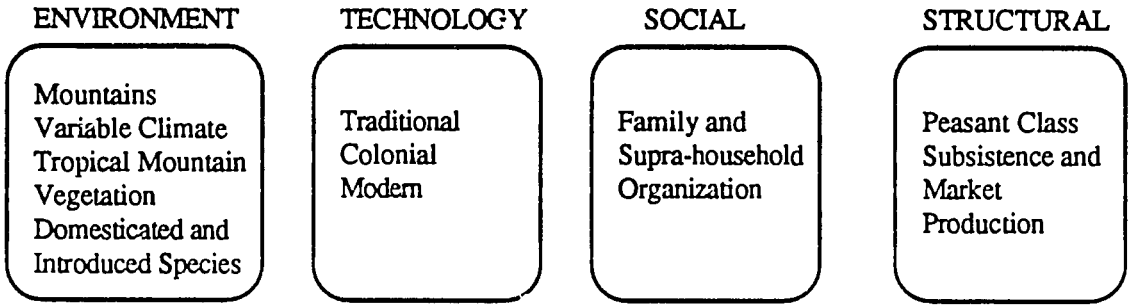
Diversified small-scale agriculture in the highlands is a technological adaptation to the mountain ecological conditions, because family-based farms with labor-intensive technologies are also characteristic of other mountain environments such as the Himalayas and the Swiss Alps, unlike

large- scale specialized units that require homogeneous environments found in flat areas. One of the advantages of the small-scale farm unit is that it can respond flexibly to heterogeneous environmental conditions characteristic of mountainous areas.

Low (1967) and Le Baron (1979) report alarming rates of erosion in Peru and Bolivia, respectively. Zamora and Medina (1969:46) state that "Peru has one of the world's most spectacular erosionable formations. Erosion is active and continous. Based on estimates, annually some 200 to 300 thousand hectares of top soil with a depth of 20 cms are totally destroyed by erosion." Slope agriculture, overgrazing, road building, and deforestation are among the direct causes, but Caballero (1981) points to social and economic determinants for the serious erosion problems in the Peruvian highlands: 1) the disintegration of the community as an institution and its role in regulating land use; 2) the decadence of the *hacienda* system and the role the owners and administrators played in regulating land use on large units of land; 3) the increase in livestock; and 4) the intensification of agriculture because of population growth and the expansion of commercial agriculture, which reduces the fallow cycle and exposes land to greater danger of erosion. Godoy (1984) has shown that land degradation in the Potosí area of Bolivia resulted from two centuries of firewood depredation that the Indians had to deliver to the Potosí smelters in the 16th and 17th centuries as part of their tribute obligations. Furthermore, massive absorption of inmigrants who were settled on marginal lands aggravated the rapid processes of resource degradation.

Four dimensions will be considered in this paper in the design of a coherent policy: environmental considerations, technological aspects, social characteristics of the populations, and structural aspects (Diagram 1). These latter refer primarily to the relationships that Andean peasants have to the larger society of which they are part, and, very importantly, because they can be modified, to the relationships the peasantry have with the state. The intent of this paper is not to describe nor to summarize vast information available for each one of the "boxes," but to try to explain the inter-relationships and effects on each other. The important point to note is that a variable environment calls for variable responses.

DIAGRAM 1
Characteristics



Environment and Technology: For a geographical and climatic analysis of the Andean highland environment see Winterhalder and Thomas (1978). A discussion of climate and how it relates to agricultural development is provided by excellent study in the Vilcanota Valley of Cuzco in Peru by Daniel Gade (1967). For an overview on peasant production systems and environmental concerns see ECLA and UNEP (1983). Pastoral systems in the southern altiplano are analyzed by Tapia and Flores (1984). The minor Andean crops (excluding maize and potatoes) and their potential for development are analyzed by Tapia et al (1979). Kubler (1944) discusses the evolution of Andean communities since colonial times, and a good example of the peasant family adaptation to mountain agriculture is provided by Brush (1976, 1977). **Agrarian Reform:** For Ecuador see Barsky (1984), for Peru see Alberts (1983) and Matos and Mejía (1980); and for Bolivia see Carter (1964) and Heath et al. (1969).

PEASANT FAMILY FARMS AND COMMUNITIES

All three Andean republics have witnessed significant agrarian reforms in the past three decades, beginning with Bolivia in the 1950s followed by Peru in the 1970s, and rather more timidly, by Ecuador, also in the 1970s. As a result, the old *hacienda* is history; so are the traditional service tenancy relationships by which free labor was delivered to the landlord in exchange for the right to cultivate a small subsistence plot. In the three countries, peasants have gained a measure of political power. They have benefited to a small extent from education and the provision of basic health services and today they are linked much more to the rest of the country by roads, markets, and labor migration. Though the *sierra* population is still the poorest and neediest in the Andean republics, change has not passed it by as much as more pessimistic readings of the situation would have us believe.

What is also significant is that most or all of the artificial structures that were set up by the agrarian reform process, such as cooperatives, service cooperatives, Agrarian Societies of Social Interest (SAIS), *sindicatos campesinos*, and so forth, to a large extent have collapsed or been dismantled (for Peru see Eguren 1987) . Some experts would regard this as a sign of failure of agrarian reform. An alternative interpretation proposed here is that this dismemberment of the productive structures created by agrarian reform represents the third phase of the reform. The first one was the process of expropriation. Then in the second, the state, where it had enough control and power, set up its own organizations, such as cooperatives. The third phase then is the "adjudication" process proper, where the peasants, who previously were only given legal title, actually took control of the land and began to restructure it in their own ways.

By and large, it has been the old peasant community that has assumed control of the land. This type of organization, largely bypassed and ignored by the reform process, has actually emerged strengthened and fortified through the long years of struggle against *haciendas* and against the state.

Communities have the potential to become the dynamic promoters of social change. They can partially overcome the problems of family-based enterprises (which pose problems of economies of scale), they are existing organizations that fiercely cultivate the spirit of self-help and self-governance, they are units that have been around for a very long time (at least since colonial times), and they provide the best way of linking the collective problems of environmental management to the economic needs of individual families. Policy measures directed at communities also facilitate policy implementation, because it is easier to deal with and through an organized intermediate organization such as the representatives of a local community than with each one of the hundreds of thousands of individual peasant families.

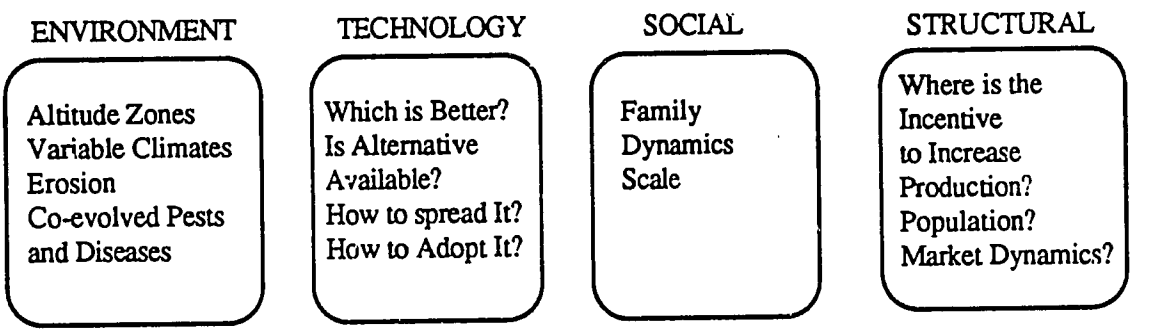
Generally, however, communities have been considered bastions of traditionalism and the peasant populations within them as being resistant to change. This is not so. Economists from the Andean Pact countries (which include Colombia and Venezuela as well as Ecuador, Peru, and Bolivia) estimate that peasant agriculture generates between 50 and 60 percent of the basic agricultural consumption commodities of these five countries (Ortega 1982). In Ecuador the peasant sector registered a 3.5 percent annual growth rate between 1965 and 1967 and 1975 and 1977, while the agricultural sector as a whole grew only at an annual rate of 3.3 percent (Ortega 1982:88). The case of Boliva is also illustrative since small-scale peasant agriculture is definitely the predominant agricultural farm unit. In Bolivia production of typical peasant crops in the highlands grew at an annual rate of 4.4 percent between 1950 and 1974-1976. In the years inmediately after the agrarian reform, the rate was even higher reaching an average annual growth rate of 6.3 percent between 1950 and 1961 (Ortega 1982: 88). For the peruvian *sierra* Caballero (1981:176) calculates that predominantly small-scale family agriculture produced 48.8 percent of the gross value of agricultural food crops and 53.1 percent of animal products in 1972.

PROBLEMS IN ANDEAN AGRO-PASTORALISM AND HOW PEASANTS ADAPT TO THEM

The basic question is whether the drive toward increased production comes from the market incentive to make profits, or whether it is a result of population pressure and the need to feed more mouths. There are two long and heated debates about the peasant agricultural sector in Latin America. The first is concerned with the "logic" of the farm-family enterprise. Does it respond to the profit motive in the same way as a capitalistic firm does, or is it primarily concerned with assuring its own subsistence base? Because farm families need to do both, a better way to approach this problem is to observe the degree of market integration of peasant family production. Caballero (1984:20) concludes that in Peru the average share of monetary income in the total income of highland peasant families falls between 60-70 percent, though specific studies give

higher ranges of 80 percent in the Cajamarca region, and as low as 30 percent in some southern regions of the country. The share of monetary income derived from the sale of agricultural and livestock production that is marketed comes to 29.8 percent and off-farm wages account for 18.9 percent in one detailed study of southern Peru (Figueroa 1984).

DIAGRAM 2
Problems



It can be assumed that in seeking cash for their produce, peasants would be interested in obtaining as high a price for their product as any other economic actor, even though structurally peasants are in a situation of being price takers because they have little influence on the factors that influence price formation. The other debate is related to the hypotheses that population pressure plays an important role in changing agricultural technology through agricultural intensification (Boserup 1965). In the Andean situation both factors are important, as population in the *sierra* is increasing on a fixed land base, and, at the same time, the incentive for each household to expand the production of marketable agricultural commodities puts an even greater pressure on available land resources.

Both are powerful incentives, but the policy option is to work through the market incentive -- given other needs in these Andean states, such as food for urban dwellers, and the objective to achieve growth beyond population expansion. However, commercializing agriculture within the structure of family farms poses problems of specialization, of scale, and of increased market risk.

How is market-oriented production to be achieved given the characteristic tendency of farmers to diversify rather than specialize? Our past training and economic thinking drives us to think that specialization is a needed precondition for achieving technological improvement through economies of scale. However, this idea requires rethinking. Because specialization will only be applicable to selected small patches of the environment, it will not necessarily produce overall dynamic changes. Technological improvements thus need to be conditioned to the structure of the "firm," in this case the family farm. An important point leads us to consideration of the possible negative impact of market specialization on the natural resource base. These are fragile environments, and all technological adoptions -- traditional, colonial and modern -- have serious long-term environmental impact.

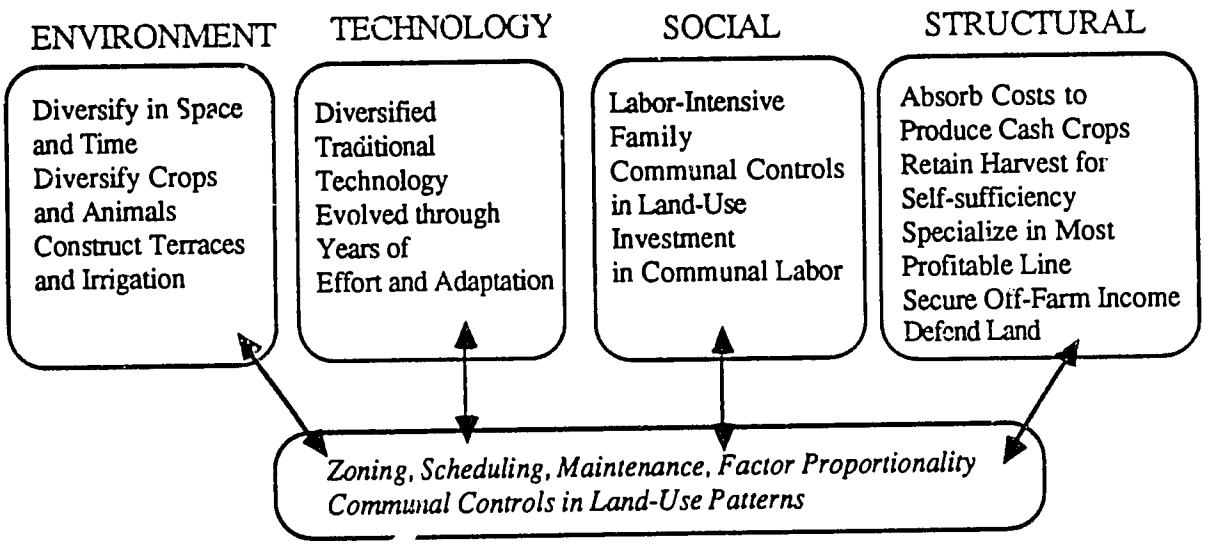
The characteristic peasant adaptations to mountain environments include diversification in time and space and in crops and animals (Diagram 3), which has been described as a risk-averting strategy but is much more complex. Diversification also exists because no one ecotype is capable of sustaining the family, nor is it capable of producing the full complement of food items the family needs, nor does each line of production fully absorb each household's labor capacity (Golte 1980). Reducing risk factors thus will not change the household strategy of diversification.

The most practical technology is basically labor intensive, uses local materials, and is locally adapted. Two major modern exceptions are the incorporation of chemical fertilizers and petrochemical insect and disease control, which are rapidly spreading throughout the Andes, and, to a lesser extent, the adoption of new and improved plant cultivars and animal breeds.

The family does not stand alone and unprotected in its environment and in facing hostile and exploitative structural factors. Family members band together into communities (whether officially recognized or not) to help each other out in reciprocal labor exchanges, in the provision of communal services, and, very importantly, to manage their land and other natural resources. Guillet (1979) and Mayer (1985) have shown that the household is incapable of completing the productive process by itself. By joining forces, certain aspects of the productive process are controlled and managed by the community. This might be termed "condominium agriculture" in order to dispel our notions about tenure arrangements (either communal or private), because it is

DIAGRAM 3

Peasant Strategies to Cope with Problems



Technology: Altitude Zones: Murra (1975) described the basic strategy of Andean peoples to simultaneously expolit diversified ecological zones in the Andes as the "vertical control of a maximum number of ecological zones," or "verticality" for various groups of ethnic organizations in prehispanic and early colonial times. Ecological complementarity, as it later came to be called, has been corroborated and studied in several contemporary contexts as well (Brush 1977; Mayer & Fonseca 1979; Mayer 1979; Yamamoto1981; Masuda, Shimada and Morris 1985). **Diversification in Time and Space as a Strategy:** Working many small fields scattered over the landscape at different times is well known and often justified as a risk-reducing strategy against climatic disasters (Camino, Bidegaray & Recharte 1981). **Labor Intensive Technology:** The most current compendium of traditional agricultural technological adaptations to the environmental conditions is provided by Morlon (1981) and Morlon, Orlove & Hibon (1982). **Livestock Systems:** Peasant forms of animal raising as part of the mixed agro-pastoral systems are reported by Jamtgaard (1984 & n.d.), McCorkle (1987), Fernandez (1986), Quijandría (1987), Brunschwig (n.d.), and Thomas (1976). For pure pastoral systems in the higher *puna* lands see Flores (1968 and 1977). **Land Management and Terracing:** Andean sectorial fallow systems are summarized in Orlove (1986). Construction of anti-erosion devices such as terraces and raised fields is discussed in Donkin (1979), Guillet (1987), and in a symposium sponsored by Peru's CONCYTEC (1986). The evaluations of an AID-sponsored soil conservation program in Peru are available in Programa Nacional de Conservación de Suelos... (1984). **Self-Sufficiency and Market Strategies:** See Lehman (1982) for a general overview, Figueroa (1984) for a quantitative case study.

similar to condominium property relationships in urban housing. Families own their own plots, as condominium owners own their apartments, but the whole territory is also a communal property, in the same way as the joint owners own the whole building. The association of owners in the building creates a management structure that maintains the common aspects of the building and creates rules and regulations about its use. It taxes owners for maintenance costs, pays the wages of the doorman, and devises mechanisms to keep the owners in line and punish those that break the rules.

Andean rural communities are organized similarly. There is a communal governing body empowered to create rules of land use, to enforce those rules, and to sanction those that break the rules. There is also a mechanism, through general assemblies, to change the rules of land-use. This communal control of land-use patterns is primarily concerned with zoning the land into different kinds of use according to productive potential, for example the alternation of pasture land with use of agricultural land (Mayer 1985). It is concerned with scheduling productive activities so that one family's activities do not interfere or cause damage to another. Through communal labor it maintains and expands existing infrastructure, and in quite a few of them it also controls access to communal resources by redistributing land unused by members to new or needy members. Communities also defend the communal territory from outside encroachment, and confront and/or cajole the state to support public programs such as road building, schooling, and health services. In a number of communities small communal productive enterprises are organized such as a small herd of animals, a few fields worked communally, or a service cooperative. Communities have viable organizations that provide the basic structure for land-management purposes. They could become the units that oversee sounder environmental land-use practices.

One of the most important trends in the last 10 years is the emergence of community organization in the three Andean countries as a strengthened, grass-roots organization that increasingly challenges government organizations, regional development corporations, and political institutions. In evaluating communities, one must bear in mind that on the one hand they are "natural" units, resulting from self-governing village organizations, although, on the other hand, the governments give them official and legal recognition through special legislation. The form of legal recognition and what is implied in such a recognition varies from one country to another.

In Peru, organized communities are corporate land-holding units with legal title to large land areas. The communities have the power to redistribute land, decide on communal uses of land, and define who is a member of a community and what rights and obligations are implied in membership. Furthermore, they have a clearly established political organization of communal

leadership. According to official sources, in 1980 there were 3,030 *comunidades campesinas* recognized by the Dirección de Comunidades Campesinas, a dependency of the Ministry of Agriculture (Table 7).

TABLE 7

Comunidades Campesinas in Peru:
Number, Population, and Proportion of Population

Department	Number of Communities	Population in in Communities	Percentage of Department Population in Communities
Amazonas	47	64,559	33.2
Ancash	193	154,390	21.2
Apurimac	180	182,932	59.2
Arequipa	180	27,776	5.2
Ayacucho	312	223,815	48.9
Cajamarca	77	100,000	10.8
Cuzco	565	335,132	46.6
Huancavelica	231	216,105	65.1
Huánuco	104	165,604	39.9
Ica	5	6,104	1.7
Junin	330	392,848	56.3
La Libertad	25	47,986	6.1
Lambayeque	16	138,244	26.8
Lima	266	156,403	4.1*
Moquegua	40	13,174	17.6
Pasco	48	95,877	54.3
Puno	460	184,450	23.7
Tacna	32	11,569	12.1
Totals	3,030	2,745,310	20.2

* Includes the population of metropolitan Lima and Callao.
Source: *Comunidades Campesinas del Peru: Información Básica*, Ministerio de Agricultura, Dirección de Comunidades Campesinas y Nativas, 1980.

From 1976 to 1980 the number of recognized communities grew by 302, an increase of 11 percent over four years. Many ex-cooperatives and other forms of organization created by the agrarian reform are currently requesting their official recognition as communities. Concentrated mostly in the *sierra*, the population in community organizations is estimated at 50 percent of the region's rural population. The territory occupied by communities is estimated to be 19 million

hectares. In the *sierra*, communities occupy 15 million hectares, or about 29 percent of the territory of this natural region (Comunidades Campesinas del Perú: Situación y Problemática 1978).

Comuna population of Ecuador is about 67 percent of the rural population in the *sierra* (Table 8).

TABLE 8

Number of *Comunas* and Population in Ecuador

Department	Number of *Comunas*	Estimated Population*
Carchi	99	107,900
Imbabura	169	510,870
Pichincha	185	577,200
Cotopaxi	240	252,000
Tungurahua	177	185,678
Bolivar	19	39,330
Chimborazo	482	292,724
Cañar	77	170,020
Azuay	39	58,500
Loja	94	101,960
Totals	1,581	2'996,182

* Population estimate is based on multiplying the number of families times 4.5.
Source: Departamento de Organizaciones Campesinas, Dirección de Desarrollo Rural, Ministerio de Agricultura, 1988.

Contemporary data for Bolivia's communities are lacking but the percentages of the rural population living in communities is equal to, if not greater than, the levels observed in Ecuador (R. Godoy, 1988 personal communication). The legal status of communities is not a real issue in the Bolivian case, because rural organizations received compulsory official recognition in the 1930s as part of the rapid incorporation of Bolivia's peasants into the political system without the need to go through a process of registration. The rural *sindicato campesino* is part of a regional and national network that comes under the aegis of the Ministry of Agriculture and Campesino Affairs. During the 1952 revolution these *sindicatos* became the most important rural organizations through which the government channelled its development efforts and the distribution of land in the agrarian

reform. Between 1953 and 1954, 22,000 *sindicatos* were formed. During this period the base communities and the formal *sindicato* organization overlapped and served the same constituency. After the demise of the MNR government in 1968 , succeeding governments have done their best to demobilize the *sindicatos* through the arbitrary imposition of leadership and party political buyouts. In recent years the peasantry of certain Aymara regions have again organized into independent political movements with strong ideological appeals to Indian culture and revindication known as *Katarismo* (named after the famous Indian leader who led an uprising in the 1870s). For 1985, the FIDA (1985: 49) report concludes that, "There is a solid community organization that provides the peasants with forms of organization in the sharing of work and mutual aid, though their experience in running modern economic enterprises is as yet limited and difficult."

Although contemporary data on Bolivian communities are difficult to obtain, a measure of the pervasive existence of communities can be seen in the data generated by the 1952 agrarian reform. The total number of units that could demonstrate communal property titles before the reform was 3,779 with 138,593 *comunarios*, or heads of households, as members of such communities. Because of double counting, the FIDA report (1985: 52) considers that a more accurate estimate for 1950 would be about 2,500 communities with an average range of 60 to 80 member households per community controlling 7.2 million hectares (22 percent of the territory) and a cultivated surface area of 170,106 hectares (26 percent of the total cultivated land of Bolivia). Although agrarian reform gave land to individuals with individual titles, social aspects and many of the productive characteristics of community life are nevertheless in existence, although there is much regional variation. Many of the expropriated *haciendas* have become community organizations having passed through an initial phase of *sindicato* organization.

Contemporary estimates of local communities in Bolivia would have to count each of the many thousands of small village settlements in the highland departments and in specific geo-ecological zones as one community, although this procedure does not take into account more complex aspects of *ayllu* organization in which smaller units are integrated into larger ones (Platt 1982, 1986).

Though communities in Bolivia, Peru, and Ecuador are overwhelmingly present as a form of social organization, the degree to which there is varying strength in community participation in land-related issues is a matter that requires further investigation.

SUSTAINABLE PEASANT AGRICULTURE

The basic conflict between environmentally sound land-use patterns aimed at long-run sustainability is against individual short-term gain, which, however, results in damaging land-use patterns (DAI 1984). Several unworkable options have often been suggested to resolve the conflict. Among them we have education to inculcate "love of nature" in the peasant so that he restrains himself from practices that have a negative impact. Another is to seek to enforce sounder land-use patterns through coercive means. With this option, the problem always lies in its enforcement. The state is simply far too weak and distant to be able to enforce such rules. Because none of these measures provides any direct economic incentive toward more sustainable agricultural practices, these suggestions do not offer any solutions.

Only an option that seeks to introduce technological practices that achieve, in as short a time as possible, both results -- environmental improvement and economic gain -- can really work. Marginal lands are generally capable of producing less than nonmarginal lands, the investment costs and maintenance outlays needed to maintain marginal lands tends to be higher than for better-suited agricultural lands, and these increased investments cannot necessarily be offset by future increased production made possible through these investments (DAI 1984:45-9). However, technologies exist that can be applied to produce economic improvements and sustainable agricultural practices in the Andes, provided that other forms of state-level support are made available to farmers on marginal lands.

To implement sound land-use policies, one must go beyond the individual farmer because "It becomes necessary to treat the community or larger units as a whole to achieve effectiveness" (DAI 1984: 51). In many areas where smallholder landholding patterns exist, it becomes more

difficult to apply effective management measures. In the Andean communities, however, rule-making and rule-enforcing mechanisms do exist and communities already have been collectively managing land use for a long time. Organizations of households that identify with their community and respect their leaders are prevalent. Policies can therefore be formulated that combine the options of individual incentive within existing and reinforced community structures. There is even an existing coercive mechanism readily available to keep offenders in line. Education about the environment can inculcate sounder land-use regulations agreed upon and enforced by the community. Longer and shorter-term improved land-management practices can be introduced through community officers (sometimes implemented first on a demonstration area) and investment in the collective improvement of lands (such as rebuilding terraces) can be undertaken. Thus, to engage the support of the communities as ready-made and existing units of land management seems to be the most effective way to devise sustainable land-use policies in the Andes.

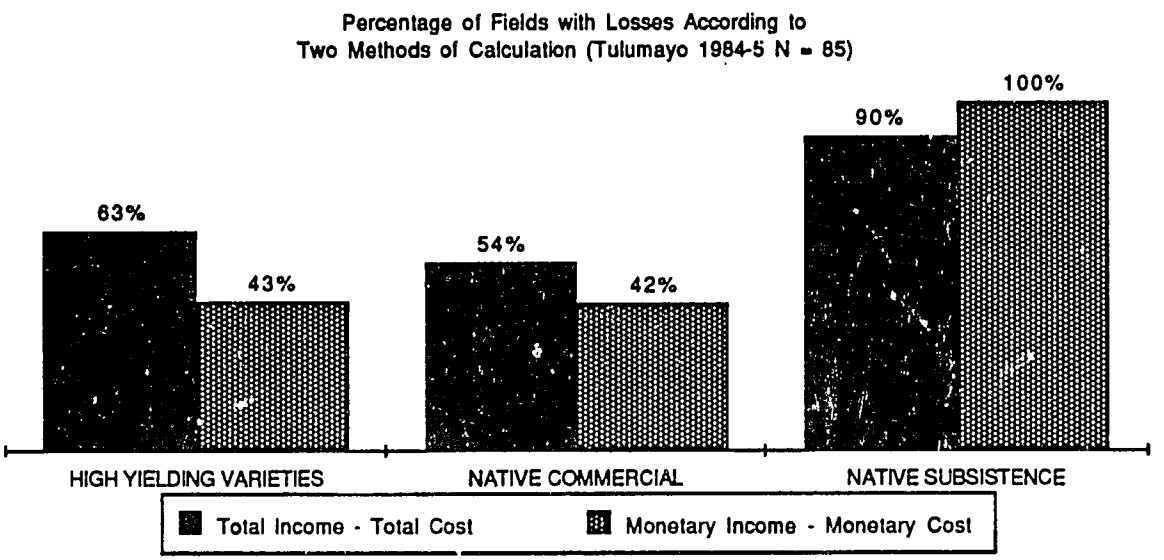
NEW PROBLEMS ARISING FROM POPULATION GROWTH AND COMMERICAL INTENSIFICATION

If economic incentives need to be linked with sustainable agriculture, it is important that farmers be able to make a reasonable return on their cash crops. However, a recent study shows that, overwhelmingly, small-scale farmers are losing money in the production of cash crop potatoes (Mayer and Glave 1989). The study was conducted in the Tulumayo Valley, Deparment of Junin, Peru in 1984-85.

The Tulumayo Valley is near to the dynamic, regional city of Huancayo in central Peru. It has a favorable climate that permits the harvest of potatoes during the months in which other regions are deficient. Seventy-seven percent of the farmers.deliver their product directly to the consumer markets of Lima (31 percent), Huancayo (41 percent) and the Satipo lowlands (5 percent). The year was a good crop year, but a disastrous one in terms of prices. Inflation of 140

percent affected every other commodity but potatoes. Their prices actually fell during the year. Sixty-four percent of the fields we studied reported losses, 63 percent of the fields planted in the newly adopted improved high-yielding varieties lost money, 54 percent of the fields planted in traditional commercial varieties lost money, and 100 percent of their native variety fields for self consumption lost money. Farmers consistently underestimate their production costs by not calculating the value of their own resources that are invested in the production of potatoes. This is illustrated in in Diagram 4 where the percentage of fields with losses are given, showing two ways of calculating profits and losses from a sample of 85.

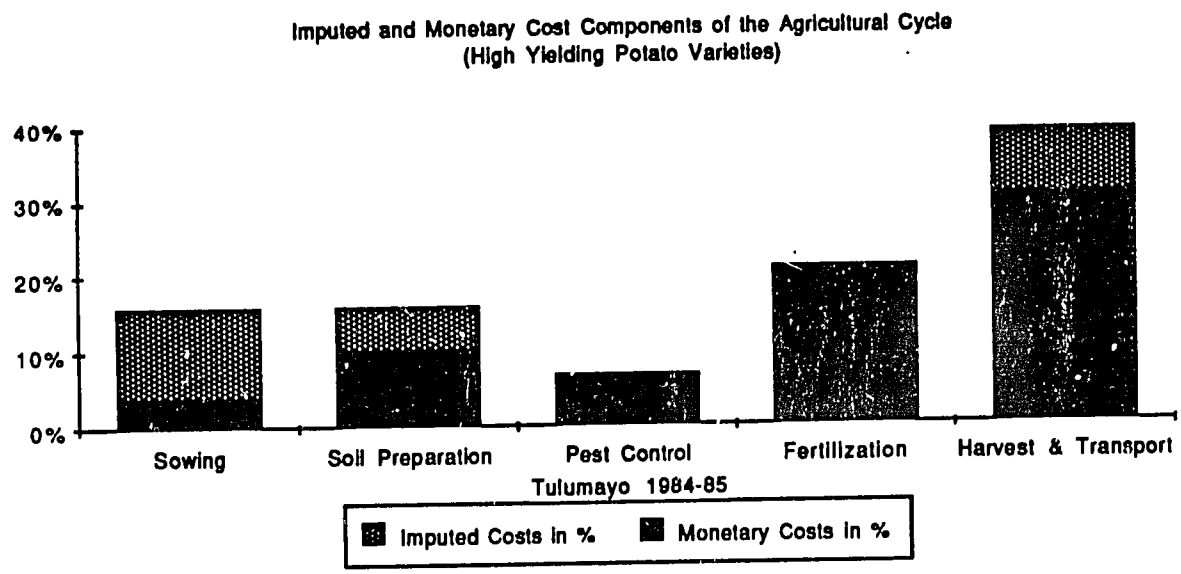
DIAGRAM 4



One way of calculating this is "our" way of doing it. That is, total income minus total costs. It imputes a cash value to the farmer's own resources such as labor, manure, seed, and harvest for self consumption at the going market rate. The other count is returns to monetary investments only, that is, money invested and money recovered and it represents the way farmers calculate their returns. By that count, the proportion of losses falls to 43 percent for the high-yielding varieties, which is also a disastrous situation, but more manageable in the farmer's eyes. One-third of the costs of production are absorbed by the household and never passed on to the

consumer (Diagram 5). Because 70 percent of production costs are monetary costs that are needed to finance the next cycle, peasants are more worried about recuperating their money investment first and therefore willing to sell their products below the real cost. Adoption of new technology has created high monetary production costs because fertilizers, pesticides, and transport account for 75 percent of their cash outlay, while half their labor and seed are the main nonremunerated contributions (35 percent of total cost). The main cause for all these losses were not low yields (average yields are very respectable for Peru at 18 tons per hectare) but rising costs and falling potato prices.

DIAGRAM 5



Peasant agriculture is a labor-intensive system. Sustainable agriculture will require that even more labor be invested in the productive process in order to combat erosion, build appropriate terraces, change to contour plowing, and so forth. It is therefore an extreme cause of concern that labor inputs in agriculture are not adequately rewarded under present conditions such as this example of peasant commercial agriculture.

Although the case presented above is representative of an extremely commercialized region during a general crisis in the economy, it nevertheless represents an overall trend from which three main conclusions can be drawn:

1) The farmers have done their share by responding to market incentives with increasing production and productivity.

2) Rising costs for their inputs and falling prices of their product account for the high proportion of losses. Pricing policies can therefore act as powerful incentives or disincentives toward developing commercial agriculture. But this requires a governmental decision.

3) However, the environmental impact of this change does not necessarily lead one to assert that this is sustainable agriculture. Two sets of problems exist. One is that the increased production is often achieved at the expense of fallow years and by the cultivation of new fields on very steep marginal lands. These trends are generating serious erosion problems. The second one is the threat of increased crop vulnerability to pests and diseases, particularly fungal attack. Chemical controls could potentially become ineffective in the near future as the diseases develop resistance requiring the reincorporation of the fallow system or implementation of integrated pest management.

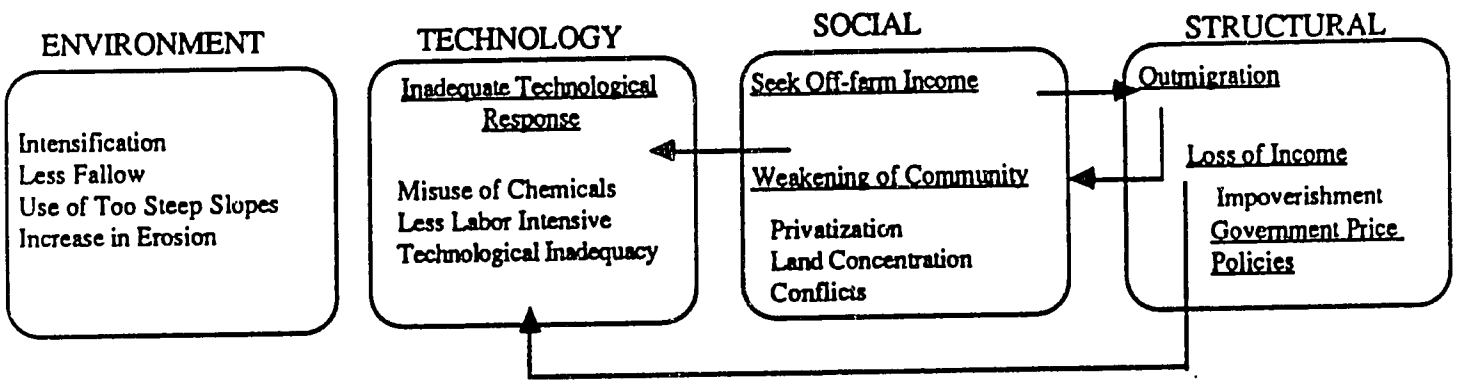
NEGATIVE FEEDBACK

Many years of losses, such as in 1984, or equivalent problems such as population expansion, land shortage, bad crop years, or a deteriorating land and resource base provoke chain reactions that have negative feedback (Diagram 6). Loss of income from agriculture initiates the chain of events and because of this individuals seek off-farm income, which leads to outmigration. This in turn leads to inadequate technological responses. Labor-intensive technological practices will suffer, particularly those that depend on long-range maintenance of terraces, irrigation canals, and so forth. Furthermore, outmigration weakens community structures. People no longer attend

communal work parties. The community's best leaders leave for the cities, and the capacity to enforce rules is diminished because communal authority has lost legitimacy. Off-farm income lowers the value of agriculture and interest in it. The end result is not necessarily abandonment of land altogether but an impoverished rural population ever less capable of responding in a positive way to market incentives or the degradation of their resources.

DIAGRAM 6

New Problems Arising Out Of Population Growth And Intensification



To reverse these trends, it is necessary to ensure that commercial agricultural production becomes a profitable activity. With increased income levels there is less incentive to seek off-farm income and more incentive to devote energy and enterprise to improve the land and to agricultural activities.

POSITIVE FEEDBACK

The emphasis of policy is to attempt to reverse these trends of low agricultural incomes, degradation of natural resources, and outmigration. It is a sound strategy to support existing positive trends and to reinforce the peasants' own responses that counteract negative feedback. Therefore, in this section those successful aspects that have worked and provided encouraging results are analyzed.

Governmental support for communities can assist in reversing these trends. It permits the strengthening of community organization, which in turn can create and expand irrigation systems, participate in road building, sponsor the opening of new lands, and encourage the development of profitable and diversified agricultural production. Credit programs directed at farmers through communal organization, rather than through individual farmers, creates situations where credit can be conditioned to improved land-use practices. Recently, Peruvian President García has held meetings with community leaders in different regions named *Rimanakuy* where each one was given a check for $5,000 in soft-credit terms. The political motivation behind this move is quite obvious. Nevertheless, an assessment of what the communities did with the money leads one to be optimistic. Over 60 percent of the soft credit was invested in productive activities, and 26 percent was invested in needed social community development work (COINCIDE 1987). These results indicate the capacity and degree of maturity that communities have shown in using scarce financial resources in a positive way. All too often development projects assume in a paternalistic way that peasant leaders are incapable of managing their own affairs or deciding for themselves what their priorities are.

The capacity of some nongovernmental organizations (NGOs) to deliver extension and help in technological development over and above the government agencies entrusted with this mission has also been impressive. To a great extent, it is because NGOs are better financed and concentrate their efforts in smaller areas, but also, because unlike government extensionists, their officers are more motivated, better trained, and have developed a mystique and proper approach in working with communities. More can be done to strengthen the extension work of NGOs.

Hopeful technological improvements that raise productivity such as the combination of high-yielding varieties, chemical fertilizer, pesticides, and credit of the green revolution are also important. As my own results show, in many ways the potato has taken off in the Andes. However, existing efforts at extending this technology is almost exclusively directed at improving commercial potato cultivation. The market for this crop is already glutted, and therefore there is a

need to look for technological improvements in other crops. There are also interesting potential expansions in Andean crops extolled by Tapia et al. (1979); and winter wheat seems to promise good results in experiments in Puno, Peru. In the southern region of Peru, barley for beer has taken off as much as potatoes have in other areas.

Priority research and development efforts should be directed to animal husbandry. Meat and animal products are in short supply. They are important food components. The Andes is a region with a vocation for animal raising (Caballero 1981) based on the high numbers of animal stock recorded in the Agricultural Census and because vast *puna* areas not suitable for crops constitute the greater proportion of the land area in the Andes. Improved animal husbandry is also free of problems of scale. Communal grazing lands can increasingly become subject to more stringent communal grazing rules based on sounder rangeland management and some of the needed infrastructural services, such as sheep dips and preventive health campaigns can be provided on a communal basis. In addition, recent studies by the Collaborative Research Support Program (CRSP) on small ruminants indicates that sanitary conditions of animals are dismal (Quijandría et al. 1987; Fernández 1986; McCorkle 1987). Improved animal husbandry also requires improved forages and management of native pastures and that implies strengthening community controls and environmental improvements.

There is a need to work on as many diverse options and possibilities as one can. A policy implication is that in a given region a wide range of technological options for crops and animals need to be made available in order for expansion to occur in as many of the microecological zones as possible.

POLICY IMPLICATIONS

For a long time the Latin American republics have set up a series of policies that are detrimental to small-scale food producers. These policies include the following elements: 1) price controls that favor urban consumers rather than producers; 2) the preference in general for lower

prices for food rather than higher wages as a policy for ensuring some kind of income stability to the urban poor, but at the expense of rural producers; 3) the relative tendency of government officials to buckle under urban pressures to enact favorable cheap urban food prices, in contrast to a readiness and fierce will to repress rural unrest and mobilization; 4) the rarity of incentives to induce producers to increase output in the countryside, which, on the rare occasions that they are granted, are given to organized lobbies of privileged producers in special areas or in unusual circumstances; and 5) the use of the existing urban bias since the 1930s as an incentive toward industrialization, with the argument that a cheap urban industrial labor force supported by the agricultural sector would provide the basis for Latin America's industrial development (Painter 1987). Part of this policy includes the importation of food which has the effect of discouraging local production. It is time that these long-term policies be challenged and reoriented.

Politically speaking, there is also a need to give the right signals. There is a need to package existing and new programs according to novel thrusts and new policy options. On environmental concerns, the thrust should be toward **sustainable agriculture**. On technology, the concept of **appropriate technology** should be promoted. It implies a diversified approach, the mix of local and introduced technological innovations, and a delivery system that is regionally autonomous and diverse.

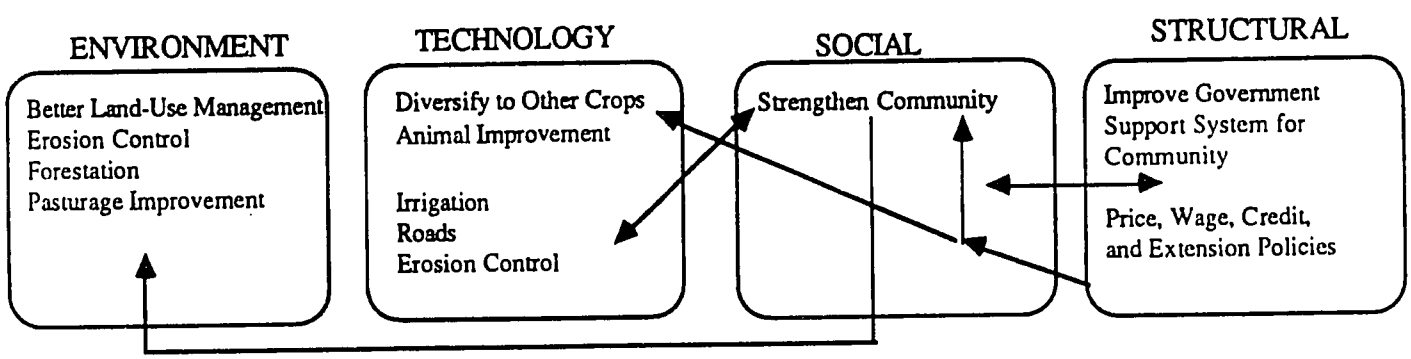
Efforts to build or rebuild an **integrated regional research and extension** capacity need to continue. Better links between communities and regional research and extension centers must be developed. If there is agreement on the need to **strengthen community organizations**, then extension and credit strategies need to be reoriented from their current practices of bypassing community organization to channeling them through communities. Finally, there is a strong case for changing the objectives of agricultural policy from increased production and productivity toward ***rentabilidad*** (the Spanish term is preferred, because it has a more reasonable connotation than "profitability." Commercial production by peasants has to be remunerative in order for it to act as an incentive). To have ministers announce that *rentabilidad* is

a policy of the government will lead to a political process whereby these matters can actually be publically discussed and measures taken. In addition, profitable commercial production will, by itself, improve production and productivity levels through market allocation mechanisms. In the past we have assumed that increases in productivity automatically lead to rising incomes, but today price and wage policies have become very important constraints, because current price and wage policies that cause losses discourage growth and development.

Government price, wage, and credit policies have significant and crucial impacts. Economists in Peru such as Adolfo Figueroa (1980) and Raúl Hopkins (1986) have called for guaranteed prices for basic food products produced in the highlands comparable to those in existence for rice production in lowland areas. In the first two years of the APRA government the terms of trade between agricultural and industrial products have actually changed in favor of agriculture with positive effects (Figueroa and Hopkins 1987) but these gains were lost again with runaway inflation in 1988. An important and significant component of new policies toward Andean agriculture **must include coherent wage, price, and credit policies to encourage sustainable agricultural development.**

DIAGRAM 7

Policy Implications



Better land-use management practices need to be introduced. AID has expended considerable effort in Peru in devising erosion-control measures and introducing new kinds of terracing systems (Programa Nacional de Conservación de Suelos 1984), some of which were

very skeptically received by the peasants in the area where I worked, whereas others have had a remarkable impact. Abandoned and functioning systems of terracing are increasingly being studied with a view of expanding and reintroducing their use (Denevan et al. 1985, CONCYTEC 1986, Erickson 1986, Guillet 1987). Lessons learned from this new research need to be reintroduced to communities. Small-scale irrigation systems as locally self-managed systems are being reevaluated (Allpanchis 1986, Guelles 1986).

In 1986 the Peruvian government created an equivalent to Franklin Roosevelt's Works Project Administration (WPA) to provide temporary income for the unemployed. This program, called Programa de apoyo al ingreso temporal (PAIT) used the work force in rural areas to reconstruct terraces. Much has gone wrong, partly because the job of reconstruction was given to contractors who regard their job as finished when the terrace has been built. There is no evidence yet that the PAIT terraces are put to agricultural use. However, there is room for improvement and extension of both programs. In my view, PAIT programs need to be transferred to more permanent, development-oriented activities. The program should also be placed under stronger communal control and made compatible with existing patterns of communal labor practices. Forestation, pasturage control, irrigation, and environment-conscious road building are other programs in obvious need of continued support.

The need to diversify diffusion of improved technology to include crops other than potatoes has been mentioned, as has the urgent need to improve animal husbandry. Credit availability should be redirected through communities because community leadership will be strengthened when they have important activities to supervise, resources under their control, and ways to distribute responsibility and benefits. Directing actions through existing community organization, rather than bypassing them, will strengthen these organizations.

Policy efforts should also be directed at strengthening the government's delivery system. I use Peru as my main example, however, trends are similar in Ecuador and Bolivia as well. In Peru, the Dirección de Comunidades Campesinas in the Ministry of Agriculture has been left to

decay since the overthow of the Velasco government. At that time, all government agencies were put under the umbrella organization of Sistema Nacional de Movilización Social (SINAMOS), which acquired a bad reputation as the political arm of "hot-headed revolutionaries." The administration of Morales Bermudez then proceeded to dismantle SINAMOS, reassigning tasks according to functional specializations within the different ministries. As a consequence, the one organization that could coordinate and project itself politically as the branch of government concerned with *campesino* affairs was left in the attic of administrative structures. The Belaunde administration, even less concerned with *campesino* matters, pursued a policy of benign neglect. Each government agency now deals with the communities or the peasants directly and they often work at cross-purposes and undermine each other. There is no overall long-term planning or coordinating body. The Dirección de Comunidades Campesinas has complex tasks entrusted to it but has no budget. Each time President García attends a *Rimanakuy*, he makes promises that require implementation. Some sort of coordinating mechanism capable of converting the promise into policy and action is necessary. A strengthened delivery system of government support with its own research, policy formulation, and implementation capability directed at *comunidades* will undoubtedly give direction and purpose to a long-range policy concerning Andean agricultural developments.

Sustainable land-use patterns require the interaction between economic incentives and communal organization. And improved, mixed agro-pastoralism on fragile lands requires the presence of a strong communal organization, which has persisted and recently emerged strengthened in the Andean countries. Thus, the political, economic, and social opportunities are present in the Andean countries for the implementation of major policy changes that could lead to sustainable economic development. The ultimate goal is to achieve both sustainable and remunerative agriculture in the Andean highlands.

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