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SOCIAL FACTORS RELATED TO THE
USE OF SOME MODERN
TECHNIQUES IN AGRICULTURE BY
COMUNEROS IN TWO HIGHLAND
REGIONS OF PERU

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UNIVERSITAIRE PERS ROTTERDAM



Social factors related to the use of some modern techniques in agriculture by *comuneros* in two highland regions of Peru

Social factors related to the use of some modern techniques in agriculture by *comuneros* in two highland regions of Peru

Proefschrift

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geboren te Paramaribo, Suriname

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Promotor: prof. dr. J.M.G. Thurlings

To my parents

Acknowledgement

The present study is based on data collected in 1972 in six rural areas of Peru as part of an evaluative study executed by the Centro de Investigaciones Sociales, Economicas, Politicas y Antropologicas (CISEPA) of the Pontificia Universidad Católica del Perú at the request of the Sistema Nacional de Apoyo a la Movilización Social (SINAMOS). The SINAMOS authorities have made the data available for further analysis and I was granted the right to use them by the University. I am very grateful that I was given this opportunity and should like to express my gratitude to the SINAMOS and University authorities, and especially to Father F. MacGregor, s.j., Rector of the University for his support.

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Maria Fernandez and Mary Hole edited parts of the text, and June Taylor edited the manuscript.

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Tylers Green, Bucks, 1975

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1. Introduction

The present study is a sociological analysis of social change and specifically of the acceptance and utilisation of modern agricultural techniques by *comuneros** living in two of the Peruvian mountain regions.

The material presented is part of an evaluative study carried out in 1972 in six geographical zones of the central and southern Peruvian Sierra.** The object of the study was to evaluate the *social impact* of some projects carried out within the framework of the *National Project for Development and Integration of the Rural Population* (Proyecto Nacional de Desarrollo e Integración de la Población Campesina, PNDIPC).

For a long time the rural population had been neglected by the various Administrations of the country. As a consequence of such neglect, inhabitants of the Sierra regions were kept on the fringe of national society. The lack of integration into national educational, economic and political systems can be deduced from the high indices of illiteracy, non-participation in the monetary economy and in national political activities.¹ In 1964 the then Government designed a development strategy to solve some of the problems of the Sierra population and consequently to improve their standard of living. The Inter-American Development Bank (IDB) offered financial and technical assistance to implement the project.

- * The Spanish term *comunero* refers to a member of a *comunidad*, a rural settlement which has special legal status in Peru.
- ** The study was carried out by the Social, Economic, Political and Anthropological Research Centre (CISEPA) of the Pontifical Catholic University of Peru, contracted by the National System of Support for Social Mobilisation (SINAMOS). The agreement was authorised by Decree No. 0042-72-MS.

1.1. THE PERU-BID* 85 SF/PE PROJECT

As a result of conversations which took place towards the end of 1964 between representatives of the Republic and the Inter-American Development Bank, in February 1965 the Peruvian Government submitted to the IDB a request for loans to finance a 'Programme for the Increase of Productivity in the Rural Communities', which was basically a scheme of credit facilities for small scale agriculturalists.

In March of 1965, the Bank sent out an exploratory mission to evaluate the aforesaid request and to define, in consultation with Peruvian authorities, the kind of assistance that IDB would be able to offer for the preparation and execution of the Project. This mission enabled the Peruvian Government to prepare a project which would endeavour to solve the basic problems of the rural population by presenting solutions which would assure integrated economic development.

On 8th March, 1965 the Peruvian Government created the National Community Development Council (Consejo Nacional de Desarrollo Comunal, CNDC). This organisation relied on permanent advice from *Acción Andina*, a specialised regional agency of the United Nations, which co-ordinated the development of a new project entitled 'Project for the Development and Integration of the Peasant Population.' The total proposal required a budget equivalent to 39.6 million U.S. dollars. A request presented on June 22, 1965, proposed that 21.6 million dollars be financed by IDB. In successive negotiations this sum was reduced to 20 million dollars.

Forestalling the formal delivery of the document, IDB sent a second mission to Peru from June until the middle of August 1965. In co-ordination with the regional representative it proceeded to evaluate the Project and to negotiate with Peruvian authorities on a preliminary basis. As a result of this evaluation, certain aspects of the project were replanned or modified. The IDB's definite financial participation was then consolidated through loan contract 85-SF/PE, dated March 1, 1966.

The economic and social problems justifying the realisation of the project from the point of view of State organisations are presented in various documents published by the National Office for Communal Development² and can be summarised as follows:

A. An intensive destruction of the basic resources necessary for the existence of the rural population was caused by irrational and extensive

* Banco Inter-Americano de Desarrollo, the Spanish for Inter-American Development Bank.

exploitation of basic resources, e.g. land, aggravated by demographic pressure.

- B. The owners of large estates (*latifundia*) with a feudalistic structure not only controlled their *peones*, but extended their influence also to the nominally independent native communities. This resulted in the extension of anti-social labour practices and led to irrational utilisation of land.
- C. In some regions the small land-holdings (*minifundia*) were split up into dozens of small scattered plots and, due to lack of capital and inadequate technical knowledge were worked in an irrational way.

This greatly reduced the possibilities of social and economic development of large parts of the rural population who were kept at a subsistence level, and led to exploitation and domination of the rural population whose participation in the political, economic, social and cultural life of the country was minimal. This domination and non-participation were evidenced by high indices of illiteracy, underemployment and unemployment, sub-standard alimentation and social conflicts.

1.2. AIMS, ORGANISATION AND LOCATION OF THE PROJECT

The project was planned in such a manner as to assure the integration of the functions and activities of all participating State and semi-State organisations. Three basic considerations were taken into account when determining the aims, organisation and zones in which the project would operate:

- ‘1. The multiple problems that impeded or limited the general development of the rural population were inter-related.
- 2. It was necessary that all the organisations that might intervene in the project should participate in all its stages; they should be involved in the planning, execution and evaluation in order to assure the full utilisation of human, economic and material resources.
- 3. The traditional spirit of co-operation of the rural communities was essential for the success of the Project.’³

1.2.1. *The aims of the project*

The fundamental aims of the project, as presented in the Semi-Annual Report from the National Council for Communal Development from January to June 1967, are as follows:

I. *Social-cultural aims*

1. to lessen the marked social differences existing between the native population and the rest of the country by expediting the process of socio-cultural integration;
2. to banish as far as possible the causes of underdevelopment; to furnish peasants with adequate environmental conditions through the development of programmes for housing, health, education, etc., which would contribute toward raising the standard of living;
3. to develop the personality and potential capacities of the rural population;
4. to promote educational changes, not only amongst peasants but also among officials who would take part, directly or indirectly, in the Project.

II. *Economic aims*

1. to defend and utilise natural resources in an optimal way (land, water, flora and fauna), in order to ensure the maintenance of adequate standards of living among the native population and to alleviate demographic pressures on the land;
2. to improve the peasant's income, incorporating him into a monetary economy, by means of the use of modern techniques in his agricultural activities that actually constitute his principal sources of income.

III. *Political and administrative aims*

1. to assure that the peasant becomes aware of his responsibility as a citizen;
2. to suppress or neutralise the influence of factors which cause social tensions;
3. to ensure greater operational efficiency of the various participating entities by overcoming technical, material and economic limitations, thus establishing effective co-ordination among them.*

The above-mentioned aims were summarised in the Annual Plan for 1970 in the following manner:

- I. To contribute toward the strengthening of internal resources by means of the organisation, channelling and orientation of the participating sectors of the country in the improvement of standards and conditions of living.
- II. To accelerate the modification of basic structures in order to expedite the integration of peasants into national life and development by means of a programme for community development whose principals

are democratic, participant, organised, educative, and integral, based on co-ordinated planning for the betterment of man.

- III. To contribute toward the establishment of a co-ordinated system of institutions and to the integration of programmes or activities so that, through 'joint action', better use may be made of public and private resources and services, to the benefit of the population.⁵

1.2.2. *The organisation of the project*

As has been pointed out before, the National Community Development Council was created on March 8, 1965, to take charge of the planning of development programmes, to co-ordinate activities of participating State agencies, to realise technical studies, to assign and supervise loans and to delineate the Joint Action Zones. The National Council was made up of representatives of the following institutions:⁶

1. The General Board of Native Affairs (Dirección General de Asuntos Indígenas).
2. The National Institute of Co-operatives (Instituto Nacional de Cooperativas).
3. The National Plan for the Native Population (Plan Nacional de la Población Aborigen).
4. The People's Co-operation and Community Development Board (Dirección de Cooperación Popular y Desarrollo Comunal).
5. The Research and Agricultural Improvement Service (Servicio de Investigación y Promoción Agropecuaria).
6. The National Office for Agrarian Reform (Oficina Nacional de Reforma Agraria).
7. The National Planning Institute (Instituto Nacional de Planificación).
8. The Ministry of Public Education (Ministerio de Educación Pública).
9. The National Social Welfare Fund Board (Dirección del Fondo Nacional de Bienestar Social).
10. The Agricultural Improvement Bank (Banco de Fomento Agropecuario).

This national structure was repeated on a zonal level. The intention was that the Council should function as a collegiate organisation. Upon initiating its activities, the principal task of the National Council for Community Development was to co-ordinate the activities of the participating entities, and to design the project.

On March 26, 1969, the National Office for Community Development was created by Decree No. 17532, and assumed the responsibilities of the

National Community Development Council which remained as a collegiate consultant organisation. To comply with the aims and objectives of the project, an administrative organisation was set up and a group of sub-projects was designed and planned. These included economic development activities affecting agriculture, cattle breeding, handicraft, small rural industries and public works. Supporting activities such as health, education, housing, anthropological research, training, evaluation and agrarian reform were also planned.

There were eleven sub-projects in all, each under the direction of independent State agencies whose activities were co-ordinated by the CNDC, later the ONDC. The sub-projects were divided into 21 programmes in the following manner:

SUB-PROJECT	PROGRAMME	EXECUTIVE ENTITY
<i>Sub-project I</i> Research, evaluation and propaganda	01. Research	IIP*
	02. Propaganda	CNDC (ONDC)
<i>Sub-project II</i> Training	03. General training	CNDC (ONDC)
	04. Tenant and development promoters training	COOPOP
<i>Sub-project III</i> Administrative organisation and legal assistance of the communities	05. Administrative organisation	DGC
	06. Aero-photometry	CNDC (ONDC) DGC and ONRA
<i>Sub-project IV</i> Substructure and rural housing	07. Substructure	COOPOP
	08. Rural housing	COOPOP
	09. Microplanning	COOPOP
<i>Sub-project V</i> Agricultural improvement and development	10. Agricultural improvement	ONRA
	11. Agricultural improvement	SIPA
Soil conservation	12. Agricultural development	JIPA
	13. Cattle breeding development	SIPA
	14. Soil conservation	SIPA

* See Appendix 3 for abbreviations.

<i>Sub-project VI</i>		
Farming loans	15. Farming loans	ONRA
	16. Farming loans	SIPA
<i>Sub-project VII</i>		
Promotion of handicrafts and small industries	17. Handicrafts and small industries	IIP
<i>Sub-project VIII</i>		
Co-operative development	18. Co-operative development	INCOOP
<i>Sub-project IX</i>		
Agrarian reform	19. Agrarian reform	ONRA
<i>Sub-project X</i>		
Public health	20. Public health	MSP
<i>Sub-project XI</i>		
Rural education	21. Rural education	Rural Education Office and Community Promotion of MEP

1.2.3. *The location of the project*

Seven Joint Action Zones (ZAC),* situated in the central and southern Sierra (see Map) were chosen to set up the project. They included:

Zone I. The Mantaro Valley

An area which encompassed the districts in the lower part of the provinces of Jauja, Concepción and Huancayo, in the Department of Junín located in the central Sierra.

The area had an estimated population of 272,000.**

Zone II. The Bombon Plateau

This included the province of Junín in the Department of Junín and the Department of Pasco. The Bombon Plateau is situated in the central mountain region and covers an area of 24 by 64 kms; the estimated population was 138,000.

Zone III. Puno-Lago

This was made up of the provinces of Huancané, San Ramón, Puno and Chucuito (a total of 27 districts) in the Department of Puno; the estimated population was 389,000.

* In Spanish these were named '*Zonas de Acción Conjunta*', ZAC.

** All population estimates refer to the situation as of 1965.

Zone IV. Sicuani

This included the provinces of Canas and Canchis (a total of 16 districts) in the Department of Cuzco. The former is situated in the Sierra region and the latter on a high mountain plateau; the estimated population was 100,000.

Zone V. Andahuaylas

This included the province of Andahuaylas in the Department of Apurímac, in the South. In the 17 districts designated the estimated population was 120,000.

Zone VI. Cangallo

This included the province of Cangallo in the Department of Ayacucho in the South of the country. In the 17 districts of the province the estimated population was 71,000.

Zone VII. Callejón de Huaylas

This is the valley formed by the Santa river and its tributaries. It consisted of 2 districts in the province of Recuay, 4 in Huaraz, 11 in Carhuaz, 6 in Yungay and 8 in Huaylas. All these districts belong to the province of Ancash, situated in the northern part of the country; estimated population 157,000 inhabitants.

The total areas covered by the seven ZAC's was approximately 40,000 km², and it was estimated that the population that would benefit directly or indirectly from the project would be 1,250,000 persons.

The evaluative study was carried out in all ZAC's, with the exception of ZAC VII, the Callejón de Huaylas. Due to the enormous changes caused by the earthquake of 1970 and its aftermath, the state of development of this area cannot in any way be attributed to actions of the project.

The main criteria utilised in the selection of the Joint Action Zones were:

1. density of the population;
2. existing infra-structure of the participating agencies;
3. execution of the Land Reform (Law No. 15037);
4. existence of administrative areas that were socially and culturally homogeneous;
5. geographical location;⁷
6. manifest social unrest in the area.⁸

Location of the MANTARO and ANDAHUAYLAS regions of PERU



In each ZAC a zonal committee was installed to ensure co-ordinated actions in terms of planning and execution of programmes. Local committees were formed to define the programmes on a *comunidad* or sub-zonal level.

Although theoretically the total area of the ZAC was considered as action zone for the Project, a distinction was made between integrated, developed areas and those to be integrated and developed. This can be inferred from the 1967 annual plan developed by the National Community Development Council.⁹ The areas which were qualified as integrated and developed were those regions within each ZAC which could be characterised as:

1. Sufficiently well supplied with infra-structure facilities of the participating agencies;
2. those in which the Agricultural Improvement Bank was operating a regular loan service utilised by a sufficient number of agricultural units;
3. those in which the population made sufficient use of the other State and private services.

In the areas to be integrated and developed the following types of settlements could be distinguished:

1. Recognised *comunidades*;
2. unrecognised *comunidades*;
3. small land-holdings (*parcialidades*) and hamlets (*caserios*);
4. large estates (*latifundia*).

In 1967, when the Project was initiated, the programmes were supposed to operate in the entire Joint Action Zones. It was clearly established that there would be no intensive action zones or areas, and that the only criterion for the execution of programmes would be a sufficiently installed operational capacity in a given area. Priority for the delineation of areas of execution for each programme depended on the judgement of the sectorial commissions. Project resources however, were not to be applied within the integrated areas. Additionally, priority areas in which programmes were to be realised were:

1. Recognised *comunidades* with communal labour;
2. recognised *comunidades* with individual family holdings; and
3. groups with unspecified communal land rights.

1.3. THE NATURE OF THE NATIONAL PROJECT FOR DEVELOPMENT AND INTEGRATION OF THE RURAL POPULATION (PNDIPC)

The intention of the National Project for Development and Integration of the Rural Population was, as has been mentioned before, the improvement of the standard of living of part of the rural population of Peru. In order to achieve this goal, a series of activities was planned and executed on both the *comunidad* and individual level.

On the community level, an attempt was made to connect the community with the existing road system. Additionally, national institutions such as education, social welfare and agricultural extension services were introduced and/or improved. On an individual level, technical instruction was given to farmers and cattle owners and public health campaigns were conducted. Activities were directed toward the qualitative improvement of the *comunidades* and of the standard of living of the *comuneros*. These activities were intended to result in a better integration of the peasant population in the national society, enabling them to participate more actively in the cultural, social, economic and political life of the country.

The process of social change initiated by the PNDIPC can be called a process of directed social change,¹⁰ because the direction that the changes within the rural communities were to take was predefined. The basic aim of the project was the improvement of the standard of living of the *comuneros* without substantially altering the structure of society. This process of directed social change can be characterised as a modernisation process. A process of social change can be considered a modernisation process if it pursues: 'the maximisation of the potential of the society, within the limits set by the goals and fundamental structure (or forms) of the society.'¹¹

1.4. THE PRESENT STUDY

The object of this study is to analyse part of the changes effected during the six years that the PNDIPC has been in operation. An attempt will be made to analyse two of the six Joint Action Zones reviewed in the evaluative study of 1972. The choice of the Mantaro Valley and the Province of Andahuaylas is based on the consideration that both present relatively similar ecologies and basically cultivate the same products – i.e. potatoes and maize. Given these facts, it is possible to make a comparative analysis of the changes produced. The proposed plan permits analysis of the processes of social change experienced by the *comuneros* in different social contexts.

The Mantaro Valley is one of the most developed rural areas in the country. Most of its inhabitants speak Spanish and, since the conquest, have been involved in national activities and have also been participating in the monetary economy. Andahuaylas is one of the least developed areas of the country and until recently its population has not participated in national affairs. The bulk of the rural population was only recently incorporated into the national monetary economy.

Information is available regarding some of the characteristics of the *comunidad* as such, and detailed information is at hand about the *comuneros*. At the *comunidad* level the following data are collected:

1. the formal authority structure;
2. road accessibility;
3. presence of national institutional services.

The data will make it possible to measure the degree of integration of the *comunidad* into Peruvian society. In addition, information is available concerning the opinions aired by the leaders of the *comunidades* on the predisposition of *comuneros* to participate in communal activities. This information can be utilised to measure the internal integration of the *comunidades* independent of the actual participation of *comuneros* in collective activities.

To summarise, a distinction can be made at the community level as to the degree of integration into the national society, for 1966 as well as for 1972. It is also possible to establish differences among *comunidades* according to the degree of internal integration shown for both 1966 and 1972. A joint analysis of these factors will serve to characterise the different social contexts of the zones studied.

At the individual level of analysis, attention will be centred on the acceptance and utilisation by *comuneros* of some of the agricultural innovations introduced.

Factors which explain the differential acceptance and utilisation of innovations will be drawn from the relevant sociological literature. They will be used to construct an analytical model to facilitate analysis of the modernisation processes in the two zones.

NOTES

1. See also : Cotler, J., 'The Mechanics of Internal Domination and Social Change in Peru', in : *Studies in Comparative International Development*, vol. III, 1967-1968, pp. 229-246.
2. ONDC, *Evaluación del Proyecto de Desarrollo e Integración de la Población*

Campesina en siete Zonas de Acción Conjunta, Lima, 1970, pp. 1-2.

See also the different 'Plans' developed by the ONDC and the Semi-Annual reports published.

3. ONDC, *Plan Anual 70 ; Programación de Campo*, Lima, w.d., p. 3.
4. CNDC, *Informe Semestral Enero-Junio de 1967*, Lima, 1967.
5. ONDC, *Plan Anual 70*, *op. cit.*, p. 2.
6. ONDC, *Evaluación del Proyecto de Desarrollo ...*, *op. cit.*, pp. 8-9.
7. CNDC, *op. cit.*
8. ONDC, *Evaluación del Proyecto de Desarrollo ...*, *op. cit.*, p. 5.
9. CNDC, *Plan Anual (Programación de Campo)*, vol. VIII, Lima, 1967, §§. 8.1.3.1. - 8.1.3.2.
10. Rogers, E.M. (with Svenning, L.), *Modernization among Peasants. The Impact of Communication*, New York, 1960, pp. 5-7.
11. Jacobs, N., *Modernization without Development. Thailand as an Asian Case Study*, New York, 1971, p. 9. See also Chapter 2, Section 2.2 for the discussion on what is understood by modernisation and development.

2. Conceptual framework: peasants, social change and innovations

The National Project for the Development and Integration of the Rural Population of Peru (PNDIPC), which has provided the data for this study, has initiated a process characterised as a modernisation process (see p. 11). Its aim was to improve the standard of living of part of the rural population of the ZAC's by means of institutional improvements and introduction of modern techniques in agriculture and animal husbandry. It would seem helpful to describe the overall characteristics attributed to the population involved, as considered in literature dealing with the introduction and diffusion of innovations.

In the first part of this chapter characteristics attributed to the peasant in social science literature will be briefly reviewed. A distinction will be made between socio-economic, and socio-psychological or socio-cultural, characteristics. Some observations will be made as to how the socio-psychological characteristics are treated in the literature.

The second part of the chapter consists of a description of types of social change and a brief treatment of the differences between modernisation and development.

The third and last section is a description of the different models that were used to explain the introduction and diffusion of innovations.

The chapter provides a frame of reference for subsequent analysis. Later, relevant parts of the chapter will be applied to the two geographical areas of Peru on which the study is focused.

2.1. COMUNEROS AS PEASANTS

The purpose of the Peru-IDB 85 SF/PE Project was to improve the living conditions of *comuneros* in the ZAC's. *Comuneros*¹ are persons living in a recognised rural community and who possess certain characteristics required by law to be considered as such. In everyday language, the legal terminology of Peru and social science jargon, the term 'peasant' or *cam-*

pesino is used to refer to the rural population in general, including the *comunero*. Although the *comunero* is a peasant, he is a particular kind of peasant.² In order to discuss adequately the specific characteristics of this group it will be necessary to look at the way social science literature deals with the concept of peasantry. The presentation will be general and will present elements used to describe peasants generally – i.e. in all parts of the world. In Chapter 3 these characteristics will be related to the rural population of Peru, and with special reference to the two geographical regions focused on in the study.

2.1.1. *Socio-economic characteristics*

The peasant has been characterised as a member of a special rural stratum of society with its own sub-culture originating in former historical times. He lives in rural areas and his occupation – agriculture – determines his life style. He works the land with the help of his family producing mainly for home-consumption. He has *de facto* control over the land he tills although the property may belong to another person or institution.

Peasants can be distinguished from primitive cultivators as well as from farmers who produce for a money market.³

The so-called primitive, or tribal, cultivator can exist outside of a given national society. The peasant, on the other hand maintains an asymmetrical relationship with the existing national society, in the sense that the society has jurisdiction over him but he cannot influence the nature of the relationship itself. As a member of society he is bound by a series of legal and administrative dispositions which influence his existence. He participates, although only marginally, in the national culture but maintains a sub-culture of his own which is not shared with any other existing stratum of the society.⁴

Peasant sub-culture has characteristics which have continually been adapted and re-interpreted throughout history. This sub-culture is perhaps the most outstanding distinction between the peasant and the farmer, apart from the fact that the latter produces for a monetary market. The farmer generally has no sub-culture of his own and is more integrated into the contemporary national society. If it were possible to speak of a farmer's sub-culture, it would only be a rural version of a given national culture. In this sense the existence of the peasant as a distinct social type is only a temporary phenomenon. As the peasant replaces his particular cultural elements with those of a national culture, he will no longer exist as an autonomous type and will be converted into a full member of contemporary society, either as a farmer or as rural or urban proletariat.⁵

Agriculture is the peasant's way of life; he cultivates the land, with the help of his family, mainly for home-consumption. His whole life is centred around small crops and/or cattle farming.⁶ Products are destined for family subsistence rather than for commerce. If he does sell his produce, this is done in order to obtain goods he himself does not produce⁷ or to pay land rental.⁸ The peasant's commercial undertakings demonstrate the asymmetric relationship existing within the national society. He is often exploited by merchants and middlemen who buy his products cheaply and charge him high prices for the goods he wishes to acquire.⁹

The primitive cultivator belongs to a self-supporting society. All buying and selling takes the form of barter and is generally realised within the same group. In the case of the peasant, barter may exist within the same stratum. However, as his society is not self-supporting, he needs cultural elements from the outside and is therefore subject to the discriminating practices of merchants and middlemen. Due to the fact that farmers are integrated into a national society, they participate knowledgeably in the monetary market.

The peasant has *de facto* control over the land he cultivates, although it may belong to another person or institution. In general this means that the peasant is free to cultivate and dispose of his crops as he wishes, even though there are cases where rent or tribute must be paid with part of the harvest. The fact that the peasant controls the land does not imply that he is the legal owner. There are two basic forms of land-peasant relationships. Either he or his community is the legal owner of the land, or the land belongs to someone from the outside world. In the case of the land belonging either to the peasant himself or to his community, there are different forms of tenure, depending on who the legal owner is and the permanence of the right to utilise the land.¹⁰

Land tenure classifications include:

A. *Individual property*: the land is the property of the peasant himself and he can dispose of it freely. He can inherit it, rent it, and even sell it. In certain cases he may sell or rent only to members of his community, while in others he is entirely free to rent or sell as he sees fit.

B. *Collective property*: the land legally belongs to the community and the individual peasant, as a member of the community only has a right to utilise a certain piece of that land. His rights over communal lands are forfeited if he leaves the community. Collective property tenure may take two forms:

a. *Permanent use of the land*: the land is divided into individual plots and each peasant receives a certain amount of land for his private use.

He receives these plots for permanent use; only when he dies or leaves the community is the land re-incorporated.

- b. *Temporary or rotational use of the land*: land is periodically re-distributed amongst members of the community. Each peasant receives a certain amount of land for use during a fixed period. When the period expires, the land is re-incorporated and a new distribution of available land is made. This form of tenure is the purest form of communal ownership.

Apart from these types of peasant land-ownership, there are others where the peasant rents the land from a person or institution not belonging to the peasant stratum. The peasant obtains, from the landowner, the right to utilise a certain part of the land in exchange for part of the harvest as rent or tribute. Many a time he is also obliged to work on the landowner's property and/or in his residences, or to provide other services. Various forms of this peasant-landowner relationship are still in existence. Wolf¹¹ has discerned three ideal types that adequately describe existing systems:

- a. *Patrimonial or feudal possession*: land belongs to a titled owner, and his family who has received it by supreme decree. A patrimony is inherited and the landowners have the right to demand rents and/or tributes from peasants who live on their lands. The landlord, in return, is bound to provide these peasants with certain services.¹²
- b. *Prebendary possession*: the highest political authority of the country allots land to State officials, as a prebendary possession. Although these lands cannot be inherited, officials who have received *prebends* have the right to collect tributes from peasants residing on them. The peasants owe these tributes to the governing body, and the landlord acts as the collecting agent. In most cases, however, part of the collected tribute belongs to the landlord. This form of peasant-landlord relationship has predominated in societies with central bureaucracies.¹³
- c. *Mercantile possession*: land is the private property of individuals and is considered a commodity which can be sold, rented, etc., and which serves to provide income. Peasants who live on this type of property must pay rent to the owner for use of part of his territory. These rents can be paid for with part of the peasant's harvest and/or other types of services rendered to the landowner and his family. In some instances the peasant is even bound to serve other persons belonging to the same social stratum as the landowner.¹⁴ Under this type of land-possession it is possible that, in addition to paying rent, the peasant may be obliged to cultivate specific crops which are marketed by the

landowner. This results in almost total dependence of the peasant on the landowner. In the case of mercantile and patrimonial possession, it may be that the landlord is not an individual but an institution, e.g. the Church, an enterprise, etc.

These characteristics provide a description of the ideal-typical peasant. The peasant of contemporary underdeveloped societies can, however, differ considerably from this model – depending on the degree of acculturation he has undergone and his subsequent integration into the national society of which he forms part. It is possible to arrive at a differential characterisation of today's peasant by asking certain questions about peasant sub-society and its corresponding sub-culture:

1. In what way does peasant sub-culture differ from national culture?
2. In which cultural spheres are there still peasant sub-cultures?
3. To what extent does peasant sub-culture play a role in everyday affairs?

Certain questions must then be asked about the individual peasant himself:

1. To what extent does each individual still have the specific characteristics of a peasant? For example: up to what point does he still work the land with his family?
2. How much of his produce is destined for a monetary market?
3. What kind of land tenure system is he bound by?

Culture can be considered the outcome of the interaction among people, their environment, and situations in which they find themselves. Culture has a dialectic aspect in that, once formed and defined, it tends to become independent. The experiences of former times, gained by the population and/or handed down by forefathers and fathers, acquire the status of proved knowledge and very strong counter-evidence is necessary to bring about modification. It is for this reason that modification of a culture is a slow process.¹⁵

2.1.2. *Socio-cultural characteristics*

Apart from those characteristics used to distinguish peasants from the other rural social types, a series of specific social, cultural and socio-psychological characteristics is attributed both to the peasant sub-culture itself and to the individual. These characteristics are summed up by Rogers¹⁶ and can be amended by what other authors have written on the subject. They include:

- A. Mutual distrust in personal relationships.
- B. Failure to utilise innovations.
- C. Fatalism.
- D. Low standard of aspiration toward improvement.
- E. Lack of deferred gratification.
- F. Limited time perspective.
- G. Familism.
- H. Dependence on governmental authority.
- I. Localism.
- J. Lack of empathy.

A. Mutual distrust in personal relationships

'Peasant communities are characterised by mutual distrust, suspiciousness and evasiveness.'¹⁷ This affirmation is supposed to apply to peasant communities in general and, consequently, to the individual peasant. There are indications, however, that at least in some parts of Asia, and above all in China and Japan, communities (and therefore individual peasants) have systematised mutual operation.¹⁸

B. Lack of use of innovations

'The norms of most peasant communities are negative toward change as a result of past generations of generally unfavourable conditioning toward innovations.'¹⁹ It is said that the peasant is not willing to accept innovations due to his traditionalism.

Peasant culture is supposed to favour an unaltered way of living and, consequently, peasants are unwilling to change life style. The use of innovations introduced by outsiders is said to be disapproved of, and as the peasant cannot face negative social pressures, he complies with the group-norm by discontinuing the use of an innovation in order to avoid being an outcast.

C. Fatalism

Fatalism is understood as an individual's perception that he cannot influence his own destiny and the resulting tendency to accept life as it is.²⁰ A person who is fatalistic adjusts himself to situations as well as he can. As the peasant perceives himself powerless, he is unwilling to try to change his situation. Three sub-types of fatalism are generally accepted²¹ in social science literature:

- a. '*Supernaturalism* consists of traditional theological beliefs and magical notions which, by their manipulation, provide the individual with a fatalistic escape from daily insecurities.' Rites performed to assure a

good harvest, or good results in fishing and hunting activities can be considered examples of supernaturalism.

- b. '*Situational fatalism* is an attitude of apathetic passiveness that stems from an accurate understanding of limited possibilities of improving life conditions.' It is recognised that the peasant considers his living conditions undesirable but, due to his correct perception of the unavailability of a means of improving his situation, he opts for resignation.
- c. *Project negativism* is a type of fatalistic apathy toward innovations that is founded on the peasant's previous failures. Due to negative results of previous attempts to improve his situation, the peasant becomes uninterested in the possibility of successfully changing his condition.

It may be deduced, then, that peasant fatalism is based partly on magico-religious beliefs, and partly on his correct understanding of the limited possibilities of realising desired changes. The three types of fatalism are in fact only two types. One based on the magico-religious beliefs, and the other on his knowledge of the situation in which he lives.

D. *Low level of aspiration*

It is a common observation of students of peasantry that the peasant has a low level of aspiration, both for himself and for his children.²² Consequently he is said to be unwilling to engage in activities intended to better his situation. He seems to accept present conditions and does not desire that his children's fate be different, i.e. better, than his.

E. *Lack of deferred gratification*

'Deferred gratification is the postponement of immediate satisfaction in anticipation of future rewards.'²³

Instead of trying to realise goals in the future by sacrificing present satisfaction, the peasant is said not to save but rather to spend money on feasting, drinking and non-durable items.²⁴ He is consequently unable to acquire enough capital to improve his living conditions.

F. *Limited perspective of time*

The peasant is said to have an inaccurate sense of time: he 'generally operates in undefined time periods,'²⁵ having only crude and imprecise measuring devices. The fact that the peasant does not tend to think about the future, but seems to be more concerned about the past and the present, is often related to this observation.

G. *Familism*

It is a supposition that peasant culture prescribes: 'the subordination of individual goals to those of the family.'²⁶ The mutual distrust said to exist among peasants leads to dependence on close kinship ties as a means of coping with the hazards of a hostile outside world. The protective function of the extended family is viewed negatively in social science literature. It is said that the subordination of the individual to the family group solidifies conservatism, due to the fact that family authority rests with an elderly person who supposedly inhibits the introduction of changes. Consequently, familism is said to impede both individual and community development.²⁷

H. *Dependence on governmental authority*

'The peasant's attitude toward national and local government appears typically to be a peculiar combination of hostility toward and dependence upon it.'²⁸ The peasant is considered to behave with hostility and indifference toward state officials as a result of suspicions concerning their real intentions. He is unlikely to trust officials, and will only reluctantly accept their recommendations.

Conversely, 'villagers tend to regard most village improvements as the job of the government rather than their own.'²⁹ Thus, instead of trying to improve the situation himself, the peasant is said to rely excessively on the government. In this case he follows all recommendations of state officials, even when they are not properly understood. He accepts innovations simply and solely because they were suggested by a state official – a recognised source of authority.

I. *Localism*

Localism means the degree to which an individual is orientated towards his own community rather than towards a national society and the outside world as a whole. According to social scientists, the localistic tendency of the peasant is demonstrated both by a lack of geographic mobility and by a lack of utilisation of mass communication media. Due to the absence of adequate road systems, the peasant tends to remain in his own community. He does not travel to nearby towns or other settlements and as a result, the number of peasants migrating to urban settlements is said to be low.³⁰ In addition the peasant is said to make little use of mass media; thus remaining unaffected by the outside world.

J. *Lack of empathy*

Lerner introduced the term empathy to describe the crucial element that

distinguishes the traditional from the modern individual.³¹ Empathy is supposed to be indispensable if an individual is to participate successfully in social and cultural changes. It is the capacity of projecting oneself into or imagining oneself in a different role. The individual should be capable of imagining himself in the role of one who holds a different social position. It is even supposed that the individual should be able to act out that position. The peasant is considered to make up the most traditional sector of society, and therefore lack of empathy is supposed to be one of the characteristics of peasant sub-culture.

The above-mentioned characteristics are considered to be the basis of peasant culture. They are closely related to poles on the continuum: traditional – modern (see 2.2 and 2.3). Contemporary industrial societies, both Western and socialist are considered to be prototypes of modern society.³² As regards non-modern societies a distinction can be made between:

- A. *Traditional societies* which are agrarian and static with an ascriptive hierarchical organisational structure;³³ and
- B. *transitional societies* which are mainly agrarian and generally have an ascriptive hierarchical organisational structure but which are undergoing an accelerated process of social change.³⁴

Several authors³⁵ have tried to measure the characteristics of peasants on attitude scales in an attempt to differentiate between peasants according to the degree in which they are traditional or modern. In social science literature however, no distinction is made between group and individual characteristics. It seems more accurate to distinguish culture – as a set of norms, values and beliefs – from those characteristics possessed by any given peasant. Culture as a normative system exists independently from its concrete, individual manifestations.³⁶

2.1.3. *A criticism of the socio-cultural characterisation of peasantry*

The socio-cultural characterisation of peasantry, given above, closely follows the treatment given to peasantry in current social science literature. The overall tendency is to treat peasantry as a general and universal phenomenon without considering local and historical conditions. When speaking about peasants, social scientists can mean: thirteenth century European peasants, rural populations of today's developing countries, subsistence farmers in any part of the world ; or post-tribal groups.³⁷ The category is too general and diffuse to be useful. Social scientists fail to

consider the time and space dimensions and thus present a particular type of abstract peasant with no empirical counterpart. In order to describe the characteristics of peasant sub-culture correctly, both geographic location and historical development must be taken into account. Current social science literature describes a set of socio-cultural elements that does not cover the total range of those elements which make up peasant sub-culture. In addition, they do not take into account the specific social and physical environment of a given peasant group. This way of characterising peasant sub-culture is incomplete, inexact, unsystematic and biased. The characterisation of the peasant given in social science literature pretends to be a complete operationalisation of the concept. However, at best it can be considered an unsystematic impressionistic description of the peasant.

The characteristics discussed in 2.1.2 cannot be accepted *a priori* as being an adequate or universal description of all peasant sub-cultures. They are based on an almost implicit comparison between the empirical manifestation of *some* elements of *some* peasant groups and the idealised form of Western urban culture. The result of this comparison is that peasant sub-culture seems to lack a series of cultural elements that it should possess. Moreover, because these elements are lacking, peasant societies are bound to remain at their present level of development unless they change their ways and acquire the missing elements which will enable them to develop themselves and their communities.⁹⁸

If one wishes to detect the relevant characteristics of a given peasant group at a certain time, one has to take into account the historical experience of that group.

Analytically, the process of peasant group formation can be reconstructed in the following manner. The peasant stratum came into existence when autonomous cultural groups were incorporated into a broader structure (i.e. the state), or when non-agricultural groups overran agricultural ones. Peasant sub-culture then is the result of cultural contact and the subsequent acculturation process. The characteristics of the resulting peasant cultures must be determined then, by an analysis of the following factors:

- A. the culture of the pre-peasant group,
- B. the culture of the dominant group,
- C. the manner in which the dominant group interfered with the internal arrangement of the pre-peasant group,
- D. the system established to govern relationships between pre-peasant and dominant groups; and
- E. the manner in which these relationships were actually implemented.

Empirically, the peasant stratum has been a dominated and exploited one. Due to this structural characteristic, it is to be expected that some elements of peasant sub-culture will be similar all over the world. Hypothetically, it follows that some of these characteristics will also be possessed by any group or stratum that has been subjected to domination and exploitation or been the victim of frustrated aspirations.³⁹

Peasants are said to be subjected to pressures:⁴⁰

- A. from the physical environment,
- B. from within the peasant society itself, and
- C. as a result of relationships sustained between the peasant group and a given national society.

One of two possible basic means seems to have been adopted by peasant societies to cope with these pressures. The *first* is a system of intense local group co-operation that assures the survival of all community members. A typical example of this can be observed in the Russian *mir* before the Soviet revolution, where ownership of the land was collective and all available land was periodically re-distributed among community members for their individual use. The *second* common solution is the one in which each family strives to counterbalance pressures individually and is concerned only with its own survival; hence the predominance of individualism or atomisation. These two courses of action are polar types and the empirical situation of peasant communities can be located at either extreme or somewhere in-between. The course adopted depends: a. on the nature of the pre-peasant culture, and b. on the relationship maintained by the peasant group with the rest of society during and after the sub-culture's formative period.

Although little adequate data are available concerning pre-peasant culture, some evidence can be gathered from the predominant cultural style or ethos of late nineteenth century tribal societies. On the basis of a behavioural study of members of 13 tribal societies, a classification of three basic cultural types was proposed:

- A. Societies with *individualistic cultures* where 'the individual strives towards his goal, without reference to others.'⁴¹
- B. Societies with *competitive cultures* where individuals are 'seeking or endeavouring to gain what another is endeavouring to gain at the same time.'⁴²
- C. Societies with *co-operative cultures* where an attempt is made to reach a goal conjointly; 'the goal is shared and it is the relationship to the goal that holds the co-operating individuals together.'⁴³

It is interesting to observe that no cultural type was proposed which could be characterised by mutual distrust, suspicion and evasiveness. Moreover, the authors who proposed this classification explicitly state that “individualistic” must not be confused with “rugged individualism” or given the aura of exploitation of others which surrounds the word in current speech.⁴⁴ If elements of mutual distrust, suspicion and evasiveness exist or predominate in a group, it is caused by the relationship maintained by the group with the outside world. In this case the outside world contrary to existing rules or standards, willfully interfered in the internal affairs of the peasant group. It can therefore be expected that some peasant groups, which have been subjected to extreme forms of arbitrary interference from the outside world, will demonstrate distrustful, suspicious and evasive behaviour. Conversely, peasant groups living in isolated localities, free of arbitrary interference from the outside, can be expected not to show this type of behaviour.

It is necessary, then, to study peasants, their sub-culture, their attitudes and orientations, taking into account present conditions as well as conditions prevalent during the group’s historical formation. In order correctly to ascribe a lack of certain cultural elements to a peasant group, it is necessary to ascertain whether it is realistic to expect the group to possess them.

2.2. SOCIAL CHANGE, MODERNISATION AND DEVELOPMENT

2.2.1. *Social change*

The process of social change alters a culture, a social structure or the functioning of a social unit. The term ‘social unit’ will be used, since ‘social system’ presupposes an adequate integration of constituent elements, while ‘social unit’ does not. A social unit can be a society (i.e. a national society or a sub-division of it), a social class, an institution, etc. Three types of social change can be distinguished, taking into account the arrangement and number of constituent cultural elements possessed by a given social unit. The term ‘culture’ is used to include ‘the totality of the material and immaterial elements created by man’ as defined by Tylor.⁴⁵

Social change takes place in three distinct ways:

- A. When constituent cultural elements are re-arranged in order to maintain and/or improve a certain level of the society’s functioning. This type of social change is realised utilising already existing cultural elements.

- B. When cultural elements are lost; i.e., when the use of certain cultural elements is discontinued, it results in modification of a social unit.
- C. When new elements are introduced into the existing culture. This can mean the substitution of existing elements by new ones, or the addition of new elements. The replacement of existing cultural elements and the introduction of new ones aim at maintaining the efficient functioning of a social unit and/or its functional improvement.

This last type of social change – C – is often referred to as the modernisation and/or development process. Two sub-types of social change as described in C can be distinguished⁴⁶ when taking into account the source or origin of the new elements and the degree to which members of a social unit have been aware of the need for their introduction. These sub-types are:

- a. *Immanent social change* takes place when members of a social unit create or invent a new cultural element. If the social unit has recognised the need for the new element or has been aware of the necessity of solving an existing problem then the change is *independent*. If the group is not initially conscious of a problem but invents or creates a new element after someone from the outside has made them aware of the existence of the problem, the change is *induced*.
- b. *Contact change* takes place when persons and/or institutions from outside a social unit present and introduce a new element. If members of the social unit have been aware of a problem, and if they choose among the elements offered, the change is *selective*. If members of the unit were not aware of a problem and simply accept the new element offered, the change is *directed*.

2.2.2. *Modernisation and development*

‘Modernisation’ and ‘development’ are terms employed in social science literature since the Second World War to characterise the specific social change processes undergone by developing countries. In the developmental stages of sociology and anthropology, social change was of main interest. Before World War II however, there was a tendency to study the actual functioning of human societies without taking into consideration their historical or cultural development.⁴⁷ Upon trying to solve the problems of developing countries after the War, sociology and anthropology again became interested in change processes.

The concepts of modernisation and development were used with reference to development policies which were applied on a large-scale basis to

war-destroyed Europe. The successful re-industrialisation of Europe after the Second World War led social scientists to believe that industrialisation would provide a solution to underdevelopment everywhere. It was felt that the central problem of non-industrial countries was lack of capital and inadequate technical knowledge. Development planners soon realised however, that collateral problems substantially affected the economic ones. It was discovered that social, political and economic organisation accelerated or slowed down introduced development. It was also observed that cultural elements such as norms, ideas and values sometimes impeded the effectiveness of development policies.

As a result of these observations sociologists and anthropologists attempted to develop concepts that would explain and provide a means of controlling these variables. Since social scientists took the development policies for granted, it is not surprising that the concepts proposed are influenced by the ideologies that were the bases of the development policies. Until recently social scientists have felt that the problem of underdeveloped countries was identical to that which industrialised countries had to solve during the last century, and therefore that any change processes they would undergo would be comparable (if not identical) to those that developed countries had experienced.⁴⁸ This reasoning was based on two assumptions:

- A. That the European modernisation process, which began with the Renaissance and continued through the French Revolution, culminating in the present state of industrialisation, was a universal phenomenon.⁴⁹
- B. That historical development is lineal, which means that each subsequent stage of development is necessarily better than the previous one.

Both premises can seriously be questioned. There is no reason to generalise any single historical process. The conscious attempt of various underdeveloped countries (i.e. Cuba, Peru, Tanzania and China) to search for appropriate roads to development, taking their specific needs into account, gives evidence that alternative processes are possible. On the other hand, the cyclical development of cultures and empires also has its champions among historians.⁵⁰ The universality of the European development process, as well as lineal historical development, can thus at best be considered hypotheses.

Two different ways of treating modernisation and development can be detected in the social sciences:

- A. No explicit distinction is made between processes of development and modernisation. They are treated as synonyms.⁵¹

B. An explicit distinction is made between the two processes. Here the terms are looked at from two points of view.

Some authors see modernisation as affecting the individual, while development as affecting society. Rogers⁵² defines modernisation as 'the process by which individuals change from a traditional way of life to a more complex technologically advanced, rapidly changing style of life.'⁵³ 'Development is a type of social change in which new ideas are introduced into a social system in order to produce higher incomes per capita and better levels of living through more modern production methods and improved social organisation. Development is modernization at the social system level.'⁵⁴ Horowitz speaks of modernism or modernisation in terms of the destruction of local and regional *cultures* as a means of creating a national *culture*. The consequences of modernism have often been the maintenance of existing *structures* whereas development refers to a rupture of tradition. 'Development implies a genuine break with tradition – a perceptible disruption of the "static equilibrium". Social development requires a new set of conceptual tools to explain reality, whereas social change may leave intact old conceptual tools adapted to modified situations.'⁵⁵ Furthermore, 'Development can be seen as an aspect of human will. It can be viewed as a particular kind of planning aimed at transforming an underdeveloped country into one which will eventually resemble either the First or Second World or some combination of the two.'⁵⁶

Other authors distinguish between modernisation and development at the level of society, when speaking of reform as opposed to revolution.⁵⁷ This type of distinction is probably the most widely used in social science at present. In the present study modernisation will be used to denote the 'maximization of the potential of society within the limits set by the goals and fundamental structure (or forms) of the society.'⁵⁸ The basic structures of society are maintained, but changes are made to maintain a given situation or to make the society function more efficiently. 'Development in contrast, is used to denote maximization of the potential of the society, regardless of any limits currently set by the goals or fundamental structure of the society.'⁵⁹ In the latter process there is no clear definition of the situation aspired to. Modifications are introduced because they are considered necessary, regardless of the consequences that they may have on existing structures.

Although the distinction is clear at a conceptual level it is difficult to operationalise, due to the fact that changes are evaluated in terms of their limitation by actual structures or without taking into account the actual structure itself. Within a specific social context, the evaluation of

modifications is subject to ideological interpretations. Given these limitations, however, it is possible to devise a series of criteria which in greater or lesser degree would make it possible to classify changes in one of the two above-mentioned categories.

According to these definitions, the PNDIPC can be characterised as a modernisation process, given the fact that it was not intended to change the existing structures in the rural areas, but rather to improve the specific situation of *comuneros* and their communities.

2.3. INTRODUCTION AND DIFFUSION OF INNOVATIONS

2.3.1. *Existing models*

There are many publications in the social sciences that deal with innovations, and in particular with their introduction and diffusion.⁶⁰ By innovation is meant the process of introduction or reception of a new element into a social unit. The element is new for the members of a given social unit, regardless of the objective character of the element itself.

An innovation has two different aspects:

- A. *Theoretical*; which is the rationality behind the innovation, and
- B. *practical*; the way the innovation is actually used, and which does not necessarily require an understanding of the theoretical aspect.⁶¹

Havelock and his colleagues have distinguished three general models that can be used to investigate and explain the creation, introduction and diffusion of innovations. The models are as follows:⁶²

- A. The problem solver model.
- B. The research, development and diffusion model.
- C. The social interaction model.

2.3.1.1. The problem solver model⁶³

This model is general and applicable to any level of analysis, provided that it is possible to consider the entity as a system, a society, an organisation, etc. The model involves two roles. That of a client who has a problem which he wishes to solve and that of the problem solver – usually an entity or organisation which will provide a solution to the problem. The foregoing distinction can be real, as is the case in uncontrolled social interaction, or it can be analytical, when used in reference to a unit that can solve a given problem alone (i.e. an individual, a business cor-

poration). The starting point is the existence of a problem along with the need to solve it. The problem in question must be carefully analysed in all its dimensions. Once sufficient knowledge has been gathered, the search for possible solutions can proceed. The most adequate available solution will then be selected and applied to the problem.

This model emphasises the close collaboration that must be maintained between the client and the problem-solving entity, so that the latter can make an adequate diagnosis of the nature and characteristics of the problem. The model places little importance on the introduction and diffusion of the adopted solution, assuming that no difficulties will arise in its use since the diagnosis has been elaborated with the close collaboration of the client.

2.3.1.2. The research, development and diffusion model

In this model the problem can be purely theoretical, that is, there is no client confronted with a specific difficulty. The model supposes that a solution will create the corresponding demand. The authors cited state that the model is applicable to the technification process of North-American agriculture. The process of innovations in agriculture in the United States seems to have followed the stages set out by the research, development and diffusion model. Basic agricultural research results were obtained and re-elaborated on products with a practical application. Thanks to collaboration between centres for basic and applied research and agricultural extension services, these products reached farmers. The model is descriptive and has been widely used in the United States to promote legalisation for basic research.⁶⁴

2.3.1.3. The social interaction model

Here attention is centred primarily on the introduction and diffusion of innovations, a process which requires interaction and communication among individuals within a social unit.* It is worth mentioning that the 'two-stage flow of interaction'⁶⁵ theory, which has demonstrated the importance of social factors in the explanation of behaviour, was derived from this model. To be more precise, it has been possible to obtain useful results with it in the study of the influence of opinion leadership, interpersonal contacts, social integration, formal and informal organisation,

* In this study the term social unit instead of social system will be used, because it does not presuppose a high degree of integration of its components.

etc. The model does not contemplate the origin of innovations, nor does it usually take into account the social unit as a cybernetic system searching for means to attain a common goal. The social unit in this model (i.e., a group of labourers, a group of communities, a society, etc.), is represented by a network of roles and channels of communication with organisational as well as formal and informal associations which form barriers and overlapping connections.⁶⁶

The three models succinctly described above are complementary and not competitive. Havelock and his colleagues have attempted to synthesize the three models on the basis of a cybernetic system.⁶⁷

2.3.2. *Additional elements for the social interaction model*

The so-called social interaction model has been considered with reference to the present study because the study is itself concerned with the introduction and diffusion of innovations. The model implicitly assumes, however, that the innovations introduced must be accepted by all members of a social unit⁶⁸ due to the fact that programmed innovations represent the best available course of action at a given moment in time. The specific features found in the two geographical zones selected for this study possess a series of limiting factors which make it difficult to assert that all members of a social unit can effectively employ the presented innovations efficiently. This implies that modifications will have to be made in the original version of the model. To do this it is necessary to reconsider the relationship between the problem itself and the specific innovations contemplated.

As a means of clarification, take the case of a sub-society, faced with a problem. The leaders of the society perceive the existence of the problem which confronts members of the sub-society and they are willing and able to solve it. Members of the sub-society may or may not agree with them about the existence and gravity of the problem. In this case it should be assumed that, due to the difference in level and quantity of technical knowledge available to the society, a discrepancy in appreciation is caused by the fact that members of the sub-society may not be sufficiently conscious of their problem and/or its gravity.

Suppose, now, that leaders of the society analyse a problem acknowledged by the sub-society and propose a solution. Faced with the proposed solution, two reactions are possible: the sub-society may be in favour of the solution offered as it coincides with their desires; or the sub-society may disagree with it, indicating a discrepancy between the proposed solu-

tion and their desires. When the solution offered coincides with the one desired, a case of non-directed social change occurs. Here the introduction of innovations, representing the solution to a problem, is relatively easy due to the fact that there is agreement between the sub-society and the society concerning both the nature of the problem and the adequate solution. However, when there is no agreement between desire and proposal four situations are possible.

- A. Members of the sub-society have no solution for their problem and the solution offered is unknown to them.
- B. Members of the sub-society have no solution for their problem; they comprehend the solution offered but do not consider it workable.
- C. Members of the sub-society have a solution for their problem which differs from that proposed by leaders of the society, but they are willing to accept the proposed solution.
- D. Members of the sub-society have a solution for their problem; they comprehend the solution offered, but prefer their own.

In order for the solution offered to be accepted in any of the above-mentioned situations, it becomes necessary to convince the members of the sub-society that the solution offered is the most adequate for their problem. It is evident that the convincing process will be relatively easy in situation 'A' and quite difficult in situation 'D'.

When it happens that members of the sub-society are not conscious of their problem, it becomes necessary to clarify the problem before presenting the solution. If it should happen that the problem does not exist for members of the sub-society, the proposal of a solution becomes irrational and any attempt to introduce it will, undoubtedly, lead to failure. On the other hand, if members of the sub-society can be convinced of the existence of the problem, it will be possible to introduce the desired innovation. It is possible that the society may decide to push the solution offered (i.e. it forces the members of the sub-society to use the proposed solution), in such a case the relevance of the social interaction model is reduced.

2.3.3. Factors to be considered in the acceptance of innovations

Which are the factors that determine the acceptance and permanent utilisation of an innovation by members of a given social unit? A distinction must be made between two processes: the initial introduction of the innovation, and its diffusion among the members of a social unit once it is used by a minority.

In sociological literature the following factors are considered relevant to the acceptance of innovations:

- A. *Characteristics of the change agent*; the person and/or institution that tries to introduce an innovation.
- B. *Characteristics of the innovation*; both intrinsic (inherent to the innovation) and extrinsic (relevant only within a specific context).⁶⁹
- C. *Characteristics of the sub-society or social unit* into which the innovation is to be introduced.
- D. Whether the nature of the innovation requires collective acceptance or not.
- E. The nature of communication channels used.

These factors will be discussed in greater detail later depending on the degree of importance they have for this study and on the information available concerning their influence on the acceptance process. In addition to these five factors, an attempt will be made to deal with the individual characteristics of members of the sub-societies which are relevant to the acceptance of innovations. These characteristics are often treated⁷⁰ as part of the characteristics possessed by the social unit as a whole. Later it will be shown why it is convenient to separate the two groups of variables, i.e. the individual characteristics and the community level variables.

2.3.3.1. Characteristics of the change agent

The change agent is a professional whose job is to bring about the acceptance of an innovation which a promoting agency considers desirable.⁷¹ He could be a state official, a technician, an international co-operation volunteer, or even a salesman of new products who desires to increase his sales. It would seem that the salesman would have little success in introducing innovations, due to the fact that members of a social unit usually attach little credibility to him because of his interest in the sale of his products.⁷² Bertoli, however, has shown that in Peru peasants connected with a brewery used more agricultural innovations in the cultivation of barley than others,⁷³ because the salesmen had introduced the innovations to them. The success can perhaps be explained by the fact that peasants connected with the brewery were assured of a market for their products.

The tasks of any change agent are:

- a. to diagnose the social unit's problem;
- b. to present feasible solutions, or present the solution in an acceptable manner;

- c. to encourage acceptance of an innovation;
- d. to ensure the introduction and acceptance of an innovation, and
- e. to ensure that acceptance is permanent.

In order to function successfully, it is necessary that the change agent communicates effectively with members of the social unit. Effective communication and acceptance are influenced by:

- a. the fact that the change agent is orientated more toward his client's needs than to the rules of the promoting agency;
- b. the extent to which he is capable of presenting innovations which meet his client's needs;
- c. his capacity for empathy with his client's needs;
- d. the degree to which he can establish rapport with his clients;
- e. the extent to which he works with and through local opinion leaders, and
- f. his efforts to increase the capacity of members of the social unit to evaluate innovations.

2.3.3.2. Characteristics of innovations

In order to be accepted successfully, an innovation must possess a series of characteristics that facilitates its acceptance. Rogers⁷⁴ presents these characteristics as being subjective – that is, as perceived by the members of the social unit – without distinguishing between intrinsic and extrinsic factors. However, they can also be used objectively, as a means of classifying and evaluating innovations. This is important to promoting agencies who plan policies on the basis of objective characteristics and cannot wait for a subsequent evaluation by the members of a social unit. Knowledge of the objective characteristics of innovations is useful for the preparation of campaigns for the introduction of innovations. If relevant objective characteristics can be taken into account, it is possible to plan a strategy in such a way that innovations become more acceptable to the members of a social unit. The most relevant intrinsic characteristics cited in social science literature are:

- A. *Communicability or Observability.*⁷⁵ This is the degree to which it is possible to visualise or communicate the projected results of an innovation. The more visible the functioning of an innovation is, the easier its acceptance will be.
- B. *Complexity.* This is the degree of difficulty in explaining and utilising an innovation. Knowledge about the innovation will exist in the society, but this knowledge has to be transmitted to the individuals who

have to use the innovation. This characteristic is related to the difference which exists between the cultural level of the society in comparison with that of the social unit into which an innovation is introduced.

- C. *Divisibility*.⁷⁶ This refers to the possibility of testing an innovation on a reduced scale in order to evaluate results before using it on a larger scale. There exists empirical evidence⁷⁷ that the divisibility of an innovation is more important for first users and/or during the first phase of innovation acceptance.

The most relevant extrinsic characteristics cited in social science literature are:

- D. *Compatibility*,⁷⁸ which is the degree of congruence existing between the intrinsic characteristics of an innovation and the characteristics of other elements relevant to a social unit. In other words, the relationship among the innovation and values, former experiences and needs of members of a social unit. The greater the congruence, the greater will be the adoption of an innovation.
- E. *Relative advantage* is the degree to which it is considered that a given innovation contributes better than others toward a certain goal. A given innovation replaces another cultural element, its advantage then can be evaluated by comparing it with the element replaced. In the case of a new element, there is no criterion with which to assess its relative advantage until the results of innovation can be assessed. When determining relative advantage, costs must be considered. Costs include: a. economic cost, the cost of initial acceptance as well as the relative costs of permanent use; b. socio-psychological costs, the rupture of the social unit's normal functioning, social tensions, etc.

In order to counterbalance costs, benefits must be considered. In addition to economic benefits, the socio-psychological benefits must be taken into account.

These include: social benefits or a positive change in status within the social unit, better social opportunities, etc. and psychological benefits (i.e., greater happiness).

In addition to these commonly cited characteristics, it seems relevant to introduce two additional ones specifically relevant to underdeveloped countries:

- A. *Adaptability* is the degree to which the utilisation of an innovation is possible with the least number of preliminary changes in the normal routine of a social unit. An innovation that requires a 'small' number

of preliminary changes is more likely to be adopted than one that requires a 'great' number of preparative changes. This characteristic is related both to the intrinsic one of complexity, and to the extrinsic one of compatibility. Adaptability, however, refers to a new dimension which justifies its introduction.

- B. *Assured utilisation*⁷⁹ refers to the existence of conditions which guarantee the use of the products of an adopted innovation. The existence of these conditions can be subjective or objective. Assured utilisation is suggested because the introduction of an innovation and its subsequent adoption is not an end in itself, but a means toward the achievement of a further goal. If members of a social unit do not perceive the capabilities of the products of an innovation, it may be supposed that the degree of adoption will be limited.

2.3.3.3. Characteristics of the social unit

Due to the existing process of change in developing countries, social units are highly dynamic. A social unit may be analysed on two levels:

- A. *Structurally*, i.e. the arrangement of existing positions within the social unit; and
B. *Culturally*, i.e. the totality of norms, ideas, beliefs and values existing in the social unit.

Both structure and culture can exercise positive or negative influences on the acceptance and adoption of innovations into a social unit. This influence is called systemic effect, contextual effect, structural effect, or compositional effect.⁸⁰ The introduction of innovations, it must be remembered, tends to modernise traditional society, and is one of the reasons for their introduction. The effectiveness of the adoption of an innovation will be positive or negative depending on the degree of modernisation or traditionalism of a social unit. Rogers⁸¹ attributes the following characteristics to these two types of societies:

- A. *Traditional society* is characterised by:
- a. the lack of a favourable orientation toward change;
 - b. a simple or little developed technology;
 - c. a relatively low level of literacy, education and understanding of scientific methods;
 - d. the maintenance of status quo within the society, facilitated by personal affective relations seen as goals in themselves;
 - e. little communication with the outside world, caused by the lack of a road network and resulting in relative isolation; and

f. lack of ability to empathise with the roles of others, above all with the roles of people outside traditional society.

B. *Modern society* is characterised by:

- a. a favourable orientation toward change;
- b. a developed technology, with a complex division of labour;
- c. high value placed on education and science;
- d. rational social and business relationships;
- e. a cosmopolitan perspective, which facilitates interaction with people outside the system and results in the introduction of new ideas; and
- f. a high capacity for empathising with roles different from their own.

As in the case of the characteristics attributed to the peasant, the characterisation of the traditional society, and hence of the modern society, lacks a sound theoretical foundation. Especially with reference to the characteristics attributed to the traditional society, it turns out that these are elements that members of the 'modern' society dislike, just as the elements typifying the modern society are highly valued cultural elements in present-day industrial society.

Each of the above-mentioned characteristics falls into one of three categories of classification:

- A. *Elements belonging to the social unit itself*: values negative to change; a simple technology with its corresponding division of labour; norms that govern behaviour in general, etc.
- B. *Relationships existing between members of the social unit*: predominance of affective relationships, social integration, etc.
- C. *Individual characteristics of members of the unit*: lack of understanding of scientific methods, lack of communication with the outside world, etc.

In order to evaluate correctly the effects of characteristics of traditional or modern society, these elements must be considered in their individual manifestations or consequences. It seems, then, that it is preferable to use only those characteristics which refer directly to the social unit itself. In other words, those characteristics which are independent of individual manifestations. An attempt has therefore been made throughout this study to make a clear distinction between individual and social unit characteristics.

2.3.3.4. The modes for acceptance of innovation⁸²

A. *Individual optional acceptance*: The individual is relatively free to accept and use the offered innovations. In spite of pressure from fellow

social unit members, the individual can either decide to adopt the innovation or not to adopt it. This evidently happens if the usefulness of an innovation is of a predominantly individual nature.

B. *Collective acceptance:* Members of a social unit must decide collectively, by means of consensus or majority decision, that an offered innovation should be adopted. This type of decision-making is pertinent when dealing with an innovation involving or affecting all members of a social unit.

C. *Imposed acceptance:* An authority arbitrarily decides that an innovation must be adopted. The actual adoption by members of the unit depends on the type of innovation – whether it is individually or collectively useful – as well as on the possibilities of imposition and control maintained by the authorities involved.

2.3.3.5. The nature of channels of communication⁹³

Two types of communication channels are currently distinguished:

A. *Communication by way of mass media:* These include newspapers, magazines, radio and television. They are impersonal communication channels, and the receiver of the information cannot communicate directly with the source.

The utility of these channels is relative and depends on the capacity of members of the unit to be able to grasp the sense of the message sent. Newspapers, magazines, articles, etc., presuppose that members of the unit are literate. They are useful for:

- a. reaching a large public rapidly;
- b. creating knowledge and dispersing information; and
- c. are capable of causing changes in weak opinions and attitudes.

B. *Interpersonal contact:* Where there is a direct confrontation between the source and the receiver. The message can be adapted according to the needs of the receiver and/or the situation. This type of communication:

- a. permits an exchange of ideas, and
- b. can induce changes in rigid opinions and attitudes.

2.3.3.6. Individual characteristics

To be able to accept and utilise innovations it is supposed that a person

must dispose of a series of special elements that facilitate their acceptance. With regard to the introduction of innovations in peasant sub-societies, it seems that characteristics attributed to the peasant tend to have a negative influence on the acceptance and utilisation of innovations. If the peasant does not possess these characteristics, it is more probable that an innovation will be accepted. Thus the less peasant-like a person is, the easier it is supposed to be for him to accept innovations.

Apart from the socio-cultural or socio-psychological characteristics, a series of other characteristics is presented that make one more likely to accept innovations. A person with a higher level of education is more apt to accept innovations since he is supposedly more capable of understanding their advantages. Personal or family wealth is said to affect positively the possibilities of acceptance, although empirical data do not necessarily substantiate this.⁶⁴ In reality, acceptance of innovations seems to be connected with the perception of future profit. On this basis, those who possess moderate wealth tend to accept innovations more rapidly than those in either high or low wealth positions. The acceptance or rejection of innovations is also related to the degree to which a person is in contact with a national society, as well as the degree to which he participates in it. This is based on the assumption that those with outside contacts, and those who participate in national society activities, will have fewer negative peasant characteristics which impede the acceptance of innovations. Correlatively, it is assumed that persons less integrated into a local community tend toward a more rapid acceptance of innovations.

In short, the characteristics that either directly or indirectly most influence acceptance and adoption of innovations are:

- A. Level of education.
- B. Degree of wealth.
- C. Participation in national society.
- D. The degree of contact with the outside world.
- E. Possession of peasant socio-psychological characteristics:
 - a. Mutual distrust.
 - b. Fatalism.
 - c. Low level of aspirations.
 - d. Lack of deferred gratification.
 - e. Limited perspective of time.
 - f. Familism.
 - g. Dependence on governmental authority.
 - h. Localism.
 - i. Lack of empathy.

2.3.4. *Phases in the acceptance process*

Certain phases can be recognised in the process of acceptance of innovations.⁸⁵ The first is the *information* stage, whereby an individual becomes conscious of the existence and possibilities of utilisation of an innovation. The second stage is that of *evaluation*, where an individual obtains more details whereby he can form a favourable opinion regarding its use. Once a favourable opinion exists, the third stage brings the individual to *test* the innovation on a reduced scale. According to the results of the test, he will finally *accept* or *reject* an innovation.

It is possible that a person who has accepted an innovation and has used it for some time, may discontinue its use. Although this type of person has received relatively little attention in competent literature, it is crucial that the dissatisfaction which causes the break be understood. It seems that people who discontinue use of innovations are generally those who have adopted it relatively late and have accepted it more by submission to the change agent or because of pressure by peers than out of personal conviction. Furthermore, they seem to be people with few resources who cannot finance innovations.⁸⁶ The reasons for discontinuance are usually rational on the part of members of a social unit and the analysis of these reasons can offer valuable information about deficiencies in the structural arrangements of the social unit. This knowledge can be used to improve the policy of the promoting agencies.

2.3.5. *Typologies of adopters*

It is evident that not all members of a social unit will adopt an innovation at the same time. Once an innovation is accepted and utilised by some members of a social unit, these users can serve as sources of information for those who have not accepted it. Together with the change agent's work, their influence will cause the number of new users to increase slowly until a maximum number is reached. The process is finished when the maximum number of persons who could use an innovation are effectively doing so. This can be the totality of potential users or, if there are factors limiting the group of users, a lesser number.

It is possible to divide the members of a social unit into two categories – users and non-users – on the basis of acceptance or rejection of the innovations. In order to refine these two categories the objective pertinency of action can be taken into account. This presupposes that an action carried out by an individual is basically a rational one. It means that an action is performed on the basis of an evaluation of objectives and avail-

able means, as well as on the basis of the individual's situation within the social unit. Evidently it is difficult to evaluate the precise criteria used for each innovation and therefore, to determine whether an action realised by any of the members of a social unit is a correct and rational one.

For the majority of technical innovations criteria, which divide the categories of users and non-users into two sub-categories⁸⁷ for the purpose of evaluating appropriate action, have been drawn up by competent technicians.

Figure 1

		<i>Innovations accepted</i>	
		<i>Yes</i>	<i>No</i>
Use of innovation is appropriate	Yes	rational users (i)	irrational non-users (ii) (under-use)
	No	irrational users (over-use) (iii)	rational non-users (iv)

If the process of introducing innovations has been well prepared and the members of the social unit react rationally, squares II and III should be empty and everyone should be in square I (rational use), or in square IV (rational non-use).

Another relevant way of classifying users of an innovation is according to the moment of effective adoption. The idea is that the percentage of effective adoptions is diagrammed from the moment of introduction until the innovation has been adopted by the total target group. The figure obtained has the shape of a bell, and is supposed to have the characteristics of a normal curve. The empirical evidence for this supposition, however, is not conclusive. Using the supposed normality of the distribution

Figure 2

<i>Moment of introduction</i>	<i>Category</i>	<i>Criterion</i>
Time	Innovators	The first 2.5%
	First adopters	The following 13.5%
	First majority	The following 34%
	Second majority	The following 34%
	Laggards	The remaining 16%

together with the mathematical properties of the said distribution, however, Rogers⁸⁸ proposed five categories for classifying users of an offered innovation. The characteristics of each of the five categories are supposed to have a determining influence on the moment of adoption of an innovation.⁸⁹

2.3.6. *Consequences of the introduction of innovations*

As has been mentioned before the introduction of an innovation is not an end in itself, but a means for reaching a long-term goal. The introduction of an innovation tends to provoke changes in the social unit into which it is introduced. These changes take place in the sector directly affected but, as a consequence of the inter-relationship between cultural and structural elements of the social unit, it is probable that they will also induce changes in other sectors of the unit's social life. Changes can be classified in different ways and the consequences of an innovation must be considered at different levels.⁹⁰

- A. The consequences for individual members of the affected social unit, whether the adoption and utilisation of an innovation have been beneficial or not.
- B. The impact of the introduction of an innovation on the social unit as such: what changes have taken place in the social unit's structure and culture?

It is necessary that precise criteria be available in order to evaluate the impact of an innovation on these levels. It is evident that an assessment of the consequences is a difficult and delicate problem. Apart from the methodological and technical aspects, it has an ethical dimension which makes the realisation of an evaluation even more difficult. Specific types of consequences considered most important for an adequate evaluation of innovation procedures include:

- A. *Intentional consequences*: those which the promoters of an innovation have as objectives when planning a campaign for the introduction of an innovation. For the preparatory part of the campaign it is obligatory that its designers have clear and precise aims. Possibilities for evaluation are enhanced by the explicitness and precision of the defined aims and objectives.
- B. *Unintentional consequences*: those produced as a result of the introduction of an innovation, but which do not form part of the aims drawn up by the planning agency involved.

- C. *Foreseen consequences*: those which, during the preparation and execution of the programme, were recognised by the change agent. Adequate planning and preparation should minimise the number of unforeseen consequences.
- D. *Beneficial and detrimental consequences*: those which have contributed toward the realisation of a desired situation. Detrimental consequences are those which have a negative influence on the realisation of a desired situation.
- E. *Direct or primary consequences*: those produced by the introduction of an innovation itself.
- F. *Indirect or secondary consequences*: those which result from the direct consequences of an introduced innovation.

Apart from their usefulness in assessing the introduction of innovations, these elements are also important for the preparation and planning of introduction campaigns. If the consequences of the actions to be undertaken can be foreseen, it is possible to plan a strategy which will contribute to the best realisation of proposed aims and objectives.

NOTES

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3. Rural Peru

To enable the reader to understand recent conditions in rural Peru, this chapter begins with a historical overview. When possible special attention will be given to the Andahuaylas and Mantaro regions. It must be stressed, however, that little adequate information is available concerning the historical development of the Peruvian rural population as a whole.

In the second part of this chapter an attempt will be made to determine to what point characterisations given for peasants in sociological and anthropological literature are valid for the *comuneros* of rural Peru. Without using data collected for the purposes of this study, the characterisations will be discussed on the basis of bibliographic information, as well as on personal observations. The purpose of this preliminary analysis is to lay the groundwork for the use of relevant opinions in subsequent descriptions of the Peruvian *comunero*.

3.1. A BRIEF HISTORICAL DESCRIPTION OF RURAL PERU

3.1.1. *Pre-Inca period*

Peru has seen many non-European civilisations, the Inca empire being the latest and probably the most extensive. Due to the fact that the country was under Inca rule at the time of the Spanish conquest that period is the one best known thanks to chronicles and other historical documents. In pre-Inca times both the coast and *Sierra* regions sustained highly developed civilisations¹ whose technical and cultural innovations were adopted and disseminated by the conquering Incas.

Prior to the rise of the Inca empire, the Peruvian *Sierra* was populated by over 200 different autonomous local groups called *Reinos* or *Señoríos* by Peruvian historians and archaeologists.² About the year 1400, the area around Cuzco was the traditional Inca homeland. To the north, in what is now called Andahuaylas, lived the Chancas and Quishuas. The

Chancas, a tribe of warriors, seem to have originated in the Ayacucho region but had expanded their territory, driving the Quishuas from their homeland in Andahuaylas.³ The Huancas, a unified state of about 70 cultural groups, brought together by an unknown hero, were found farther north in part of today's Mantaro region. The Huancas were also warriors; their economy was based on animal husbandry in the highland plains and agricultural activities in the valleys where maize and potatoes as well as other high altitude crops were cultivated.⁴ Detailed information is not available concerning the state of the Chanca and Quishua economic systems in the pre-Inca period.

3.1.2. *Inca period*

In about 1438 the Incas and their allies, among them the Quishuas, defeated invading Chancas. Pachacuti Inca Yupanqui, responsible for the Chanca defeat, treated the losers gallantly. He incorporated them into his armies and thus began expanding the Inca empire.⁵ Around 1460⁶ the Incas conquered and absorbed the Huancas. The Huanca ruler remained in nominal power but the state was reduced to the position of a province within the Inca empire. It was partitioned into three districts, each with its own administrative apparatus, controlled by Inca officials. Very little is known about how the Incas actually organized their economy. It has been demonstrated⁷ that traditional analyses of the Inca land tenure system are, at best, incomplete. In addition to the distinctions of: 1. lands of the religion or lands of the Sun; 2. State lands; and 3. community lands, the chroniclers often mention private lands of certain Inca rulers. These lands were owned and worked directly by them or allotted to others as a special royal grant. Apparently the Incas were skillful politicians who moved cautiously, permitting conquered people to continue customary ways of life and implanting their administrative system whenever appropriate. Given the vast extensions of territory conquered by the Incas in a relatively short period (from 1438 to 1527), it is comprehensible that subjected peoples were permitted some cultural liberty.

Students of Inca culture agree that the most important social unit for the common man was his community or *ayllu*, and that this social unit was a carry-over from the pre-Inca period.⁸ The precise nature of the *ayllu* is unknown. According to Rowe, the term *ayllu* was interpreted in several different ways by post-conquest writers. It was taken to mean:

1. the lineage of the Inca royal class, each composed of the direct descendants of an Emperor in the male line;
2. the social unit of several extended families (...); and

3. occasionally, the *moity*. The word *ayllu* seems to have been a general word for “kin-group” in Quechua and its specific meaning was probably made clear by the context.⁹

The Inca social system was based on these local units or *ayllus*. Apparently the system was introduced whenever it was considered appropriate – diplomatically where possible, and forcefully when necessary. In order to ensure the integration of a newly-conquered tribe or lordship, part of the original population was deported to a distant province and substituted with loyal subjects from well-integrated areas. The use of forced migration as a means of ensuring a stable, non-rebellious population undoubtedly changed the nature of the *ayllu*. What had originally been a kinship unit with local residence became merely a local unit of independent families. In this respect Rowe states that: ‘While most administrative *ayllus* were probably merely the old kin groups given an official place in the state structure, there is no doubt that the Inca regrouped the *ayllus* and even created new ones when the native divisions were too small or otherwise not adapted to the purpose of Inca administration. The transformation of the *ayllu* from a kinship group to a village group of independent families, linked more by common residence than by descent, already had a good start under the Inca.’¹⁰

Agricultural lands and pastures were the property of the local group as such. Lands were redistributed periodically among all married, able-bodied members of the community according to family size. This type of land tenure seems to have been pre-Inca and to have functioned with kinship groups. After absorption by the Inca state, however, the system of collective land ownership was extended to non-kin local groups. The Inca was said to have the ultimate right over all property and the communities only had permanent usufruct. After Inca conquest a certain amount of land in each community was designated to the state and to the religion (the Sun). Harvests from the latter were said to be destined for state storage houses and were supposedly used to support priests in service.

Money was unknown in Inca society and all taxes due were paid to the ruling class either in labour or in kind. Every able-bodied man was obliged to work on state and religious land for a given number of days per year, to fulfil certain *corvée*-services, and to perform military duty. These obligations were called *mita* and were regulated by strict, well enforced codes. While performing *mita* services a man was supported by the state and provided for by supplies from state storehouses. Villagers were also bound to work the land of the village chief or *curaca*. In some cases this was an extension of the *mita*, while in others the land was worked

by collective labour called *minga*.¹¹ This form of collective labour was also used reciprocally among commoners. When the *minga* was used, the person who benefited from it was obliged to provide his fellow labourers with food and maize beer or *chicha de jora*. Lands of those fulfilling *mita* obligations, as well as the lands of widows, were worked by *minga* but in these cases no compensation was given. The nobility, as well as a special group of craftsmen and some lesser officials, were exempt from *mita*.

During the period of Inca rule a vast number of crops were cultivated, the most important being maize and potatoes. The cultivation of maize seems to have been state controlled and was carried out on terraced, irrigated land, fertilized with *guano* from the islands.¹² Maize requires warm humid climatological conditions and sufficient water. For this reason it was cultivated in low and medium altitude valleys. There is ample evidence¹³ in the chronicles that maize was considered of ceremonial importance and that it was a rich man's food. Potatoes, on the other hand, were cultivated in unirrigated fields. The successful adaptation of some species made their cultivation at high altitudes and even on the highland plains possible. Apparently potatoes were considered a poor man's fare. It should be pointed out that both crops and techniques used to cultivate them were known to pre-Inca groups. Even irrigation was widely known in pre-Inca times although there is no conclusive evidence that *guano* had been used as a fertilizer previously.

Peruvian society just before the Spanish conquest might be described in the following manner. The Inca state was composed of a number of different cultural groups that had been conquered by the Inca and integrated into an empire. A common culture had been imposed on the conquered peoples. This culture basically affected state organisation, public administration and justice, economic organisation and to a lesser degree religious and social organisation. The kinship system was probably the least affected as the Incas did allow some local customs to persist.

Social stratification and obligations can be summarised as follows: the highest stratum was made up of the royal clans or *ayllus* which included the Inca and his immediate family. The second stratum consisted of regional rulers and the highest state officials. This stratum retained the land and the servants that tilled it, as private property. Membership in the subsequent stratum was designated by the Incas to those persons not belonging to royal *ayllus* but who were favoured because of services rendered or for political convenience. It often included former rulers of conquered territories. In some cases it seems that these former rulers were permitted to retain privileges they had enjoyed under pre-Inca tradi-

tion. These included retaining land and servants as private property. Next came a stratum of lesser state officials, charged with specialised functions, such as tutors, historians, bookkeepers and craftsmen. Their functions exempted them from paying taxes. This meant that they did not participate in *mita* services which were the obligation of commoners. These non-taxpaying individuals were called *yanakona*.

The lowest stratum was formed by the commoners who either lived in their original settlements or in specially designed colonies. As members of these settlements they were assigned a certain amount of land with which to provide for their families. They were obliged to pay taxes in labour or in kind, and when on official duty (*mita*) they were provided for by the state. During periods of service their lands were cultivated by other members of the community in *minga*. Services to be rendered by the commoner were strictly regulated, taking into account the hazards involved. They were not subjected to hazardous labour for long periods.

3.1.3. *The conquest of the Inca empire; the early colonial period*

When Francisco Pizarro began his expedition in Peru in 1532, the Inca empire was plagued by civil war. Two sons of the deceased Inca ruler Huayna Capac, Athahualpa and Huáscar, were engaged in a war of succession. The question posed was whether the empire should remain a unified state or be divided into two sub-states, one under the leadership of Huáscar and the other under Athahualpa.

The principal goal of the voyages of discovery and the subsequent conquering of new continents was to spread Catholicism among the heathen. It cannot be denied, however, that for the Spanish Crown as well as for the *conquistadores* material gains were involved. In order to understand the institutions created in Peru by the Spanish after the conquest, it is necessary to consider some of the characteristics of Spanish culture and society.

Just before the first voyage of Cristóbal Colón, the kings of Castilla and Arragon had successfully carried out the *reconquista* of Catholic Spain which had been held by the Muslims. One of the institutions created to consolidate their hold on these reconquered territories was the *encomienda*. Army leaders were entrusted with the responsibility of governing sections of the population on reconquered territories. The aims of the *encomienda* were:

- to ensure the permanence of Spanish dominion;
- to reward army leaders for their participation in the war with the Muslims;

- to ensure the adequate indoctrination in the Catholic Faith of reconquered peoples.

The *encomiendas* were given in perpetuity. This meant that they could be inherited, thus laying the foundations for a class of large estate owners.

The *conquistadores* of America and most of their companions were of low class origin¹⁴ and did not have a working knowledge of Spanish institutions; it can be hypothesised, then, that they were probably familiar only with their external manifestations. As a consequence the structures created by the *conquistadores* in the newly discovered territories of América were not based on actual Spanish institutions, but on the *conquistadores'* interpretation of them.

In 1532 Athahualpa succeeded in defeating his brother's armies and virtually became the ruler of the empire. At that time, however, he was in the region of present-day Ecuador and, while camping at Cajamarca on his way to the Inca capital, Cuzco, he decided to receive the Spanish intruders led by Francisco Pizarro. The Spanish captured Athahualpa treacherously and began to form alliances with some of the dissident groups within the Inca empire. One of the first groups to ally itself with the Spanish was the Huancas¹⁵ who provided them with services, supplies, auxiliary troops and servants from that time on.

After having murdered Athahualpa in 1533, Pizarro initiated his conquest of the Inca empire. His army consisted of his original band of *conquistadores*, reinforcements from the Central American territories (Spanish soldiers as well as Indian troops) and armies provided by local allies. The most notorious were the Cañari of Ecuador, the Chachapoya of northern Peru and the Huanca from the Central Sierra region. Inca resistance slowed the conquest which took 40 years to complete.¹⁶

Upon initiating the conquest of Peru, Pizarro made use of his position as representative of the Spanish Crown to reward himself and his companions for participation in the enterprise. He used two recognised Spanish institutions, *encomienda* and *repartimiento* for this purpose.¹⁷ *Repartimiento* is the distribution of goods and lands among the participants in the *conquista*. The lands of the Inca empire, which were said to have belonged to the State and to the Sun, became the property of the Spanish Crown. These lands as well as gold and silver obtained for Athahualpa's ransom were partitioned by Pizarro among his companions according to military status and performance in the campaigns. In addition each Spaniard received a number of Indians in *encomienda* who would provide personnel to till the lands.

In contrast to the situation in Spain, the American *encomiendas* were not inherited but were granted for a period of 'two lives', after which they again reverted to the Crown. It must be remembered that *encomienda* refers to the people who inhabit the land. They, and not the land, were given in *encomienda*. In principle, lands that belonged to local groups, communities or *ayllus* were not confiscated originally, although modifications in the land tenure system were made afterwards. The combination of the *repartimiento* and the *encomienda* gave rise to the *hacienda* structure which has dominated rural Peru until very recently.

The fact that *repartimientos* were inherited while *encomiendas* were not has caused great problems in the Americas. Those who benefited from these institutions tried to ensure their perpetuity and often succeeded, given the lack of effective law enforcement which can be attributed to the enormous distances between the colonies and the motherland as well as to the susceptibility of royal officials to bribery and their willingness to be accomplices in the exploitation of Indians.¹⁸

As tributaries of the Spanish Crown, the Indians were obliged to pay taxes. These taxes had to be paid in money or silver, in contrast to the labour or kind demanded under Inca rule. As money was unknown in pre-conquest times, this placed a great burden on the Indian population. In order to provide a means of acquiring income with which to pay taxes, collective community lands were divided among the inhabitants. Each member of the community was assigned, more or less permanently, a certain amount of land as private property. In addition to taxes, the Indian population had other obligations which included working on the *encomendero's* lands and providing him, as well as the local priest, with goods to which they were entitled by law.¹⁹ The community authority structure remained intact under the tutelage of the *encomendero*. Local chiefs, now called *caciques* (a term used to designate a headman in the Caribbean area) instead of *curacas*, were to keep law and order in the village. Among other things, they were to oversee the tax obligations of their subjects and to ensure the concurrence of community members for *mita* obligations. Under Inca rule the *mita* was used to provide for the common good of the empire as a whole, but after the conquest it benefited the Spanish Crown and individual persons, especially Spanish citizens. *Mita* obligations included work in the silver, gold and mercury mines, on urban constructions and agricultural labour on the lands of individual colonists. Work in the mercury mines was greatly feared because, unlike the Incas, the Spanish did not take the hazards of the various *mitas* into consideration.²⁰ Due to hardships involved in the mining *mita*, many Indians fled to inaccessible regions or became agricultural

labourers or *yanakona*. The landowner for whom they worked paid their taxes and protected them from being drafted into *mita* service. The attachment of agricultural workers to individual landowners gave rise to villages under their jurisdiction. The villagers owed loyalty to them and were overseen by native officials personally appointed by the landowners.²¹

The situation of Peru at the middle of the sixteenth century could be described in the following manner. The highest social stratum was formed by the original *conquistadores* and their relatives. In addition to receiving land and goods in *repartimiento* and Indians in *encomienda*, they occupied all prominent positions in colonial administration. Their ranks later included officials appointed by the Crown. The subsequent social stratum was made up of 'Noble Indians'. These were members of the Inca ruling group favoured by the Spanish, together with their relatives and allies. They owned land and were retained as *caciques* enjoying some traditional privileges. They were exempt from *mita* service and their children were educated in special schools. The next stratum included colonists who owned little land, craftsmen and those engaged in clerical jobs. The lowest social stratum was made up by the common people. They lived either in their original villages or on lands of individual landowners, both Spanish and native, carrying the burden of tax-paying and *mita* services. They possessed land either as members of a traditional community or were assigned a plot by their protector. In contrast to the Inca period where there had been a more or less symmetric flow of goods and services between rulers and common people, during the colonial period there was an asymmetric flow – i.e., services provided by the common people were far in excess of those received by them.²² The Negro slaves have been excluded from this description although it can be said that the treatment received by them was far better than that of the Indian commoners.

With reference to the specific situation in the two regions upon which this study focuses, information about the middle of the sixteenth century is limited. The inhabitants of the Mantaro region had been allies of the Spanish during the conquest. Initially their fate had been no different from that of the rest of the Peruvian population. Some of their lands were given in *repartimiento* and the population was given in *encomienda*. The leaders who had arranged the alliance with Pizarro were retained as *curacas* of their traditional territories. Their subjects were obliged to render all services requested by the Spanish just as any other tax-payer. Huanca leaders found it necessary to present a petition to the *Audiencia* and later to the Crown in order to obtain certain privileges for them-

ves and their subjects. Finally, however, only one of the three petitioners, the *curaca* of Lurinhuanca – the region that comprises the present-day Mantaro valley – was successful.²³ One of the privileges obtained had a tremendous influence on the later development of the Mantaro region. Reference is made to the Royal Decree of January 31, 1564, which stipulated that no cattle-breeding *haciendas* could be established in the region. This privilege was not directly related to the alliance with Pizarro but to abuses of *encomenderos* in the region.²⁴ In spite of this, the discontent of the Huancas induced them to participate in a plot to revolt and expulse the Spanish from the country.²⁵

Apparently the inhabitants of present-day Andahuaylas remained loyal to their Inca overlords.²⁶ Their territory was given in *encomienda* to one of the most prominent *conquistadores*, Diego Maldonado, and they were mercilessly exploited by him. The burden of taxes and *mita* service was, of course, part of their lot. Some of the lands in the Andahuaylas region were given in *repartimiento* to *conquistadores* and soldiers who had participated in the *conquista*, while others were acquired through *composiciones* (legal processes by which judges or *visitadores de tierra* sold land in the name of the Spanish Crown) or bought by colonists from the original owners.²⁷ These private lands formed the nucleus of *haciendas* which later became prominent in the region.

3.1.4. *The colonial period*

Around the middle of the 16th century, the Spanish administration attempted to enforce a resettlement policy for the purpose of facilitating the indoctrination of the Indians in the Catholic faith. It should be mentioned however, that practical political and administrative considerations such as greater control over the population and easier tax collection, were taken into account and were possibly the main reasons for the adoption of the policy. Viceroy Francisco de Toledo implemented the resettlement programme, and, although the Crown had advised the use of persuasion rather than force, little attention was paid to the recommendation. The policy was directed at the population which had left its original communities in order to avoid the excessive burden of the mining *mita*.²⁸ Whole settlements were destroyed to force the people into the new settlements or *reducciones* (from the Spanish *reducir*: to reduce), which were towns laid out according to mainland Spanish tradition with a main square and grid-patterned streets. In addition to these physical changes, the administrative system of the traditional Andean community was modified, destroying the remains of the *ayllu* as a community nucleus. The

administration of the *reducciones* was put in the hands of native *alcaldes* and lesser officials elected according to Spanish administrative codes. A Spanish official however was to supervise them, thereby ensuring compliance with Spanish interests. The *reducciones* later became models for *comunidades*, settlements of socially equal commoners with active participation of all able-bodied male members in the community government.²⁹ Inca settlements cannot be considered the prototype of the *comunidades* due to the fact that elected officials were unknown to the Inca administrative system. In villages not affected by the resettlement policy, the administrative structure retained its traditional organisation. These settlements were governed by *caciques* who were under the jurisdiction of Spanish officials, originally *encomenderos*, and after the abolishment of this institution by crown-appointed officials, *corregidores*.

From the middle of the 16th century until the end of colonial rule, the situation in rural Peru can be summarised as follows. Indians were obliged to pay taxes and to perform *mita* services in accordance with legally established codes. Due to the distance between the Spanish mainland and the Americas however, the Indians were virtually at the mercy of local officials and colonists. Thus, even though the Spanish *Leyes de las Indias* were considered the most enlightened legislation promulgated by a colonial power, the reality of the Americas was quite different. The lot of the common Indian in the Spanish colonies was a hard one in general; it was even worse for the rural population.

At the end of the 17th century, the *encomienda* system was abolished. Landowners worked the land with *yanakonas*. In most instances, as has been mentioned previously, the *yanakona* entered into a landowner's service of his own free will. But as a consequence of the Spanish resettlement policy the *yanakona* became a virtual serf due to the fact that, after two years of service on an estate, he was considered a permanent resident of that settlement by law. Hence the landowner acquired unlimited power over him. In other instances a man became *yanakona* when landowners who needed manpower raided neighbouring villages, particularly *reducciones*, taking prisoners who were then declared *yanakona*.³⁰ At this time, being a *yanakona* still had advantages because a landowner protected his Indians against the abuses of other landowners and colonial officials who tried to obtain labourers for *mita* service, especially in the mines. The *yanakonas* of a *hacienda* received the right to cultivate a plot of land ceded by the landowner in payment for labour. The expansion of *haciendas* was accomplished by way of legal processes, inheritance, and by usurpation of lands from neighbouring *reducciones* or, to a lesser degree, from traditional Indian villages.

Inhabitants of *reducciones* and Indian villages were obliged to pay taxes and to perform *mita* service. In the case of the *reducciones* the situation in which the inhabitants found themselves depended a great deal on the benevolence of colonial officials. When abused, they could try to prosecute the officials involved, but justice was done slowly and often depended on the relationship the wrong-doer maintained with higher officials. The situation of the Indian villages under *caciques* was a complex one. Inhabitants of these villages were badly off due to the fact that the *caciques* in charge actively collaborated in the exploitation of the Indians. There were nevertheless cases where *caciques* tried to protect their subjects from exploitation by officials and neighbouring colonists.³¹ Towards the end of the 18th century some *caciques* rebelled against Spanish rule as a protest against the treatment given to the Indians. After these rebellions had been crushed, the *cacique* institution was abolished and all manifestations of Inca culture were suppressed.³²

Thus at the end of the period of colonial rule in Peru the Indian population lived mainly in villages, either in the original *reducciones* or in traditional villages which, after the abolishment of the *caciques*, were ruled by Spanish officials. Inhabitants had to pay taxes and, even though the colonial *mita* had been discontinued they were obliged to render service either to the landowners of nearby *haciendas* or to the villages and cities where the Spanish resided. Landowners had consolidated their hold over the *peones* living on their land and in some cases had acquired some power over the communities surrounding them. They were able to usurp lands from these communities either because they possessed the most fertile lands (especially pastures) or because they terrorised the communities with brute force.

In the Mantaro valley there were no *haciendas*. Proximity to Lima and the favourable location of the region allowed the communities to prosper. Some of the communities had specialised in crafts and some of their members became involved in commerce.³³ However, in the Yanamarca valley – that part of the Mantaro region which lies north of the city of Jauja – *haciendas* did exist and the inhabitants of nearby communities were often submitted to arbitrary treatment at the hands of the landowners.³⁴ On the whole it can be said that the Mantaro region, and particularly the Mantaro valley, fared relatively well during the colonial period.

Little is known about the situation of the Andahuaylas region at the end of the colonial period. Due to the existence of *haciendas* and the great distance separating it from Lima, the overall picture is not a clear one. *Hacienda* owners exercised an almost unlimited control over the Indians living in nearby communities. They had usurped large portions of

land belonging to the communities and even the inhabitants of these autonomous villages were at their mercy.³⁵ Due to the lack of pasture land, villagers were obliged to rent land from nearby *haciendas* and in this manner came to be the virtual serfs of the *hacendados*.

3.1.5. *The republican period*

During the struggle for Peruvian independence, Indians served in the liberator's as well as in the Spanish armies.³⁶ Once independence was obtained Creoles, the descendants of Spanish *conquistadores* and colonists, came into power. Influenced by the liberalism of the French revolution, the new rulers abolished some of the institutions which existed during the colonial period. One of these was the collective ownership of land in the traditional Indian villages; this was abolished by Simón Bolívar in 1824. The land had to be partitioned amongst the inhabitants of villages and each individual was free to dispose of his land at will.³⁷ The policy of individual landownership had disastrous effects on Andean social organisation. Unaccustomed to living in an individualised society, lacking the basis for participation in a monetary economy, and without the minimum protection of legal institutions, Indians found themselves at the mercy of landowners. Bolívar's attempt to do away with tribute failed and so the Indian population did not escape even this burden³⁸ until 1854 when Ramón Castilla successfully abolished it, out of gratitude for the help he had received from the Indian population in his military endeavours.³⁹

Several uprisings which can be classified as socially inspired took place during this period.⁴⁰ The consequences of these rebellions were mostly negative due to the fact that, in the process of suppressing them, landowners usurped even more land. As late as the 1920's the condition of the native population in the rural areas was as bad as, if not worse than during the colonial period. As a consequence of the *Indigenismo* Movement, and interest demonstrated by newly founded political parties – mainly the socialist and communist parties and the *APRA* (*Alianza Popular Revolucionaria Americana*) – there came an awareness of the unacceptable position of the Indian. The constitution of 1920 explicitly proclaimed the plight of these forgotten citizens; it stated that Indian or native communities would be recognised by law and that lands and other community properties were inalienable.⁴¹ The legal existence of *comunidades* did not become a reality, however, until the enactment of the constitution of 1933. Legal recognition did not by any means bring an end to the abuses suffered by *comuneros* and other rural inhabitants, al-

though it did allow for the possibility of obtaining legal protection from the anti-social practices of landowners. As the political structure did not change, however, landowners could still have their way because of the relationship they maintained with local political and administrative authorities. There have been several modifications in the laws and *reglamentos* that affect *comunidades indígenas*. In accordance with a given political trend, the *comunidades* were either considered as training grounds for individualised property ownership or as the forerunners of co-operatives and collective settlements.⁴²

After World War II, the rural population became actively involved in national politics and sought the betterment of its lot. Both the *sierra hacienda* workers – mostly tenant farmers – and members of *comunidades* rallied to this cause. Tenant farmers organised themselves into labour unions inspired by *APRA* militants or by members of communist and socialist-affiliated organisations.⁴³ *Comuneros* initiated a move to reclaim usurped lands, mostly through legal processes especially when the defendant was another *comunidad* or individuals connected to it. In other cases they simply occupied the land which they claimed, a method which had been frequently used by *hacendados* previously. These reclamation processes led to more violence in rural areas due to the fact that local authorities often sided with the landowners and many peasants were killed in the resulting clashes with police forces. This type of peasant activity gave rise to the belief that the time was ripe for a large-scale guerrilla operation. In 1965 urban leftists began guerrilla activities in several regions of the *Sierra*. Due to lack of peasant support and deficient military preparation, however, they were easily suppressed.

Due to the relatively high level of development of the region and its proximity to Lima, the inhabitants of the Mantaro region were in a better position to cope with hazards presented by changes in the political system and were therefore more successfully integrated into national political activities. The region had often served as a hiding place and operational base for feuding factions during the first years of the Republic.⁴⁴ At the beginning of the century additional impetus was given to the area by the introduction of mining operations specifically those of the Cerro de Pasco Mining Corporation. Although the introduction of the mining industry and dependent industrial units cannot be considered positive in all respects, it did provide job opportunities for part of the region's rural population and brought young workers into contact with unionism. As a result of these new experiences, tenant farmers of the Yanamarca valley, with the help of returning *comuneros* or outsiders, began to demand better treatment from *hacendados* and later the reclamation of lands sto-

len from their communities.⁴⁵ When the PNDIPC began functioning in the Mantaro region there were no *haciendas* of any significant size in operation.

In the Andahuaylas region the situation was quite different, due to the predominance of the *hacienda* structure and aggravated by the remoteness of the region from Lima. As a result of the well-intentioned but unrealistic approach of the liberators, landowners were able to usurp increasing quantities of land from the *comunidades*. Local authorities sided with landowners and *comuneros* had no way of counterbalancing the loss of land even though as early as 1842 they had begun litigation against local *hacendados*. A notorious case is that of the *comunidad* of Ongoy⁴⁶ which succeeded in having its case heard before the Peruvian Supreme Court. The court decided in favour of the community but when the verdict reached Andahuaylas, it had been altered to show the *hacendados* as the favoured party. The *comuneros* of Ongoy, however, found an alternative to the litigation problem. During the 1920's a number of *comuneros* migrated to Lima founding the 'Asociación Cultural de Hijos de Ongoy' with the express intention of working for the betterment of their community. They began lobbying in Lima for the restoration of usurped community lands and gained a major victory when Ongoy became the first officially recognised *comunidad indígena* of Andahuaylas in 1935. Other communities tried to use the same tactics, but with less success.

As the local elite lost its political power⁴⁷ and later its interest in maintaining land due to the intensity and frequency of litigations brought against it by the communities, it opted for alternative actions. Taking advantage of the needs and desires of landless peasants the *hacendados* proceeded to parcel out their property, selling plots either to individuals or to specially formed groups. This situation brought about a split in the rural population due to the fact that some were purchasing land claimed by others. Even when groups who had purchased *hacienda* lands had no community tradition, they aspired to obtain legal recognition as a safety device against the possibility of future usurpations.

When the PNDIPC began operations in the Andahuaylas region there were still in operation about 150 *haciendas* or *fundos*⁴⁸ of little political importance. The *comunidades* of Andahuaylas, then, presented a most complex picture. On the one hand there were *comunidades* – with little tradition in communal life which had been in existence since the colonial period – which had only recently regained independence from the *haciendas*. On the other hand there existed settlements that had never been *comunidades* but which had obtained land privately and had opted for

inscription as *comunidades indígenas* in order to take advantage of legal protection. In general, the condition of these *comunidades* was worse than that of those in the Mantaro region due to the fact that contact with national institutions was much more recent.

3.2. THE COMUNEROS AS PEASANTS

3.2.1. *The situation of the rural areas before the PNDIPC*

Before the PNDIPC was inaugurated in 1966, two socio-economic structures were characteristic of the Peruvian highland rural areas: the *hacienda* and the *comunidad*.⁴⁹ Most of the agricultural population lived within these two structures and the rest could be found in small farming settlements.

The *hacienda* is an extensive production unit – mostly privately owned – whose structure is orientated towards the realisation of productive aims to which all social relationships are subordinated.⁵⁰ The *hacienda* owner has practically unlimited powers because he either dominates local state organisations or is related to civil employees who act leniently towards him. The relationship which he maintains with his labourers keeps them permanently subordinate. Several different types of *haciendas* can be distinguished by taking into consideration types of produce, technological levels utilised in production, form of payment for labour, etc. In the Peruvian Sierra many local varieties exist and at present there is no generally accepted classification for types of *haciendas*.

In a typical Sierra *hacienda*,⁵¹ the landowner obtains workers by allowing peasants to cultivate part of his land in exchange for certain payments and services which must be rendered to him, to his relatives or to other people whom he wishes to favour. The labourer, and at times his family, is also obliged to cultivate the landowner's property for a certain number of days per year, planting, harvesting, etc. They may also be obliged to pasture *hacienda* cattle and to provide domestic services. In order to obtain seeds and tools, the labourer often borrows money or implements from the landowner which he must repay with part of his harvest. Thus the *hacienda* labourer is almost completely dominated by the landowner and has within his reach no alternative way of earning a living.

As a consequence of the usurpation of land belonging to the traditional *villages*, it was possible that a village of formerly independent peasants could be incorporated by a *hacienda*, the village members thus practically becoming serfs. This type of arrangement is known as the

comunidad de hacienda or a captive community.⁵² It is obvious that in this case, even though the peasants have the cultural characteristics of independent *comunidades* they are completely subjected to the whims of a landowner.

The independent *comunidad*, in contrast, is a rural settlement of persons who share certain cultural characteristics and are supposed to have had a common historical origin. The *comunidad* as such, or each of its members possesses land individually and it is relatively autonomous. The independent *comunidad* has a distinct set of cultural elements which it does not share with other sectors of Peruvian society. It is extremely difficult to indicate exactly what the typical cultural elements are as the variety is great. Their *communal* organisation, however, has no relationship whatsoever to other Peruvian institutional arrangements. The communal government is in the hands of the *comunero* population and each member is supposed to participate in communal meetings and other activities such as sub-structure construction, maintenance of irrigation channels, etc. In addition, the *comunero* culture has its own distinctive system of religious and magical beliefs.⁵³ It has a family system of its own as well as distinctive music and dances. In the *comunidad* one of the dialects of the Quechua or Aymára language is usually spoken. The latter cultural elements, however, are shared with the *peones*, or tenant farmers of the *haciendas*, and with members of the captive communities.

The Peruvian Government intends to give special protection to indigenous *comunidades* and has legislated accordingly.⁵⁴ In order to obtain government protection, the *comunidad* was required to be recognised by a subsidiary of the Ministry of Labour and then inscribed in a special register. As a result of registration and official recognition, the *comunidad* was to organise its structure of authority according to law. Thus some independent *comunidades* are recognised by law; these were the main objective of the PNDIPC. The recognised *comunidades* are not the most backward ones because they have access to national culture and, in spite of being peasant settlements, are governed partially by national regulations regarding authority structures. It can therefore be said that recognised *comunidades* will partly be integrated into the national society, whereas unrecognised independent *comunidades* will probably be more isolated.

The *comunidad* as such, or its members, is a land-owner in own right but there exists a wide range of land tenure systems related to the degree of integration into the national society. Three typical sorts of land tenure arrangements will be described to illustrate variations among *comunidades*.⁵⁵

- A. *The traditional case.* All agricultural and pasture lands are legally owned by the *comunidad*. Land suitable for agriculture is divided into parts. One part remains fallow for a certain period to recover fertility while the others are cultivated. At the end of a given period rotation takes place; the fallow land is cultivated and vice versa. Cultivable land is divided amongst *comunidad* members by the communal leaders who can also indicate which type of crop must be sown. The *comuneros* are obliged to follow these indications as the leaders have the power to revoke rights to land use. Pastures are used collectively, each member having the right to graze his flocks. During the sixties, this type of tenure system existed only in remote non-Spanish speaking areas of the country.
- B. *The transitional case.* Land and pastures belong to the *comunidad*. All land suitable for agriculture however, is divided amongst the members and they have the right of permanent usufruct of the plots assigned to them. Land can be inherited, hired out to other *comuneros* and, in some cases, sold with the consent of the communal assembly. Pasture lands in contrast, are used collectively by all *comuneros*. This type of *comunidad* is common in the ZAC's and relatively integrated into the national society.
- C. *The modern case.* This type is a *comunidad* in name only. All agricultural land and most of the pastures are owned by individual *comuneros* and they can dispose of them freely. Selling to non-*comuneros* is forbidden by law, but as there is no effective control this occurs frequently. As one of the main functions of traditional communal authorities is control over land distribution, communal organisation is relatively weak, inoperative, or practically non-existent. This type of settlement tends to become a village of small independent farmers and there are not many of them.

3.2.2. *Socio-economic characteristics of peasants*

Comuneros according to the socio-economic description given in Chapter 2, can be characterised as peasants. A brief review of these characteristics will be given here, with specific reference to the Peruvian situation.

It was mentioned previously that peasants form a special rural stratum of society with its own sub-culture originating in former times. The stratum itself maintains an asymmetric relationship with the national society. The individual peasant is generally a subsistence farmer who has *de facto* control over the land he tills. Although Peruvian *comuneros* are accultu-

rated to varying degrees, they possess all of the above-mentioned characteristics.

The *comunero*, as a member of his social stratum, has maintained an asymmetric relationship with the rest of the society because the rural population (particularly that of the Sierra) was generally considered the lowest social group within Peruvian society. The normal denomination used by the urban population when speaking of the *comunero* has been *Indio* or *indígena*. These terms were applied particularly to people living in non-Spanish-speaking areas who were considered ignorant and backward. During the colonial and republican eras, and until very recently, this rural population was the source of wealth and income for the non-rural, non-*Indio* population.

The rural population living on *haciendas* or in captive communities was subject to the whims of landowners and was unable to obtain justice from local state authorities. Because of his lack of knowledge concerning legal rights the peasant did not file legal suit against abuses. If a suit were filed it would probably not be justly treated because landowners as a group controlled, or had family ties with, local authorities who would side with them against the peasants. Even *comuneros* living in independent *comunidades* were subject to the arbitrary behaviour of landowners. In the Sierra the amount of arable land is limited and landowners often usurped land from the *comunidades* in order to enlarge their estates. This pushed the *comuneros* up to the less fertile mountain lands. Many a time *comuneros* were forced out by a landowner's private forces or with the help of the police. The *comunidades* were unable to stop these actions by legal means partly because of their lack of knowledge concerning legal rights and transactions, but also because of the social structure of Peruvian society.

Until recently most *comunidades* were villages of subsistence farmers who exchanged or sold part of their harvest in order to purchase goods they themselves did not produce. These transactions make manifest the asymmetric relationship between the *comunero* and the rest of the society. If they sold their products to middlemen or to non-*comunero* shopkeepers, they had to sell cheaply and in return were charged high prices for the goods they wanted to buy. Prices were always determined by the middleman or the shopkeeper. In some parts of the country *comuneros* were practically robbed of their goods. On the way to market they were met by *alcanzadores* who would 'take the produce away from them at prices established by the *alcanzadores*. If the Indians refuse to sell at the prices dictated, they were beaten up, and the produce is taken away from them anyway.'⁵⁶

Due to the fact that available land was limited in extent, *comuneros* often left the *comunidades* temporarily to work for cash on nearby *haciendas*, in mining centres, villages or towns. Wages were usually below the legally established minimum and, due to insufficient control on the part of authorities, the employers got away with exploitation.

Lack of education cannot be attributed to a lack of interest on the part of *comuneros*, but must be ascribed to a lack of facilities in the *comunidades*.⁵⁷ Very few *comunidades* had adequate schools and teachers were, for the most part, scarcely literate themselves because no one who considered himself to be 'decent' was willing to work in the interior regions of the country. The fact that schools existed in some of the *comunidades* was due to action undertaken by the *comuneros* themselves.

Around 1935, Castro Pozo⁵⁸ described the situation of the *comunidades* thus: the total number of inhabitants in recognised *comunidades* is 210,838 persons. Of these about 40% are younger than 15 years, for whom there are 237 state schools and 115 private schools; 352 educational centres in all. 33% of these centres were established due to action undertaken by individual *comunidades*. In 1962, 1,600 questionnaires were sent by mail to all recognised *comunidades*; about 40% were returned. Of these, 640 *comunidades* – not less than 83.7% of the *comunidades* surveyed – had built schools with communal labour.⁵⁹ Not only recognised *comunidades*, however, were engaged in building schools, for the urgency for education was also felt in unrecognised *comunidades*, and even on *haciendas*.⁶⁰ As most *comuneros* were illiterate they could not participate in the country's political activities. Thus the majority of Peru's inhabitants were excluded from the political process. Policy which affected the *comunero* was set by people who, at best, were indifferent to his specific problems.

3.2.3. *Socio-cultural characteristics*

Previously within this study a series of socio-cultural orientations or attitudes attributed to peasants in general has been discussed. In order to describe the characteristics of peasants correctly, factors such as historical development and relationships maintained with the outside world must be considered. The existence of peasant-like orientations or attitudes in Peru is related to the specific situations existing within the *comunidades*. If environmental conditions change, or are seen to be changed by *comuneros*, it can be expected that orientations and/or attitudes will change accordingly. It must be stressed however, that this process of change will be slow.

The series of orientations and attitudes mentioned in Chapter 2 is considered to hinder the potential for successful socio-economic development of *comuneros* and *comunidades*. This is not generally true in Peru, and a more precise and genuine assessment of the role of these socio-economic elements is in order. Peruvian *comunidades* have not been against the introduction of changes.⁶¹ There are even known cases of *haciendas* that have been successfully transformed into a kind of communal arrangement. Changes realised in the *comunidades* and on *haciendas* are partly due to outside help and the influence of migrated *comuneros* who have prospered in other surroundings.

A brief review of the socio-cultural characteristics attributed to peasants which are also applicable to Peruvian *comuneros* is in order. Both Peruvian and foreign scholars have tried to provide a conceptual model to account for the presence of these traits. The first attempt was made by Julio Cotler⁶² and his efforts were complemented by Laurence Williams,⁶³ Giorgio Alberti and Fernando Fuenzalida.⁶⁴ Drawing on what is generally accepted in social science literature regarding peasant situations and using some new ideas, these authors have produced a conceptual model which can account for some of the socio-cultural and socio-psychological characteristics of Peruvian peasants.

The model takes both the historical development of Peruvian society and the asymmetrical relationships maintained by the rural sector with the rest of Peruvian society into account. It is based on the assumption that a relationship exists between the structure of the socio-economic situation in which a peasant lives and the socio-psychological characteristic he possesses. The situation of *peones* or tenant farmers on the *haciendas* is described as one of relative scarcity. It is typified by a culture of poverty where a small group of people controls commodities and maintains direct, asymmetric relationships with the majority of the population who do not possess these commodities and are consequently dependent on the minority. The situation is graphically illustrated by a triangle without a base. People who control scarce commodities try to maintain their position by handing out commodities to those who lack them according to rules which the controlling minority are able to change at will. Consequently, people without commodities must compete with each other in order to obtain them. Competition for limited commodities breeds distrust which in time becomes generalised.

Furthermore, as there exists no fixed relationship between labour and profits received, there is a tendency towards fatalism which is probably strengthened by hazards involved in agricultural undertakings. Success in life is attributed to good luck and appropriate relationships with po-

werful people. Human beings in such situations imagine that they cannot better themselves by their own efforts because improvements are determined by forces beyond their control. In a situation where necessary commodities are controlled in an unpredictable and subjective manner, peasants are not willing to try new ways because of the possibility of negative sanctions by those in power. As a result, there is a tendency that they will have few aspirations towards the improvement of their lot and that of their offspring.

Peasants have a limited view of the world in general, due to limitations imposed by those in power with regard to travel outside⁶⁵ and education. Due to educational limitations, newspapers are out of the peasant's reach, restricting his understanding of national political and social affairs. The world of the peasant then, is limited to the *hacienda* and its immediate surroundings. As social change agents from the outside world have family ties with, or are controlled by, the power holders they are seen by peasants as a threat to their interests. Those not related to, or controlled by the power holders (such as merchants, shopkeepers, etc.) tend to take advantage of the peasants' lack of knowledge and thereby reinforce distrust.⁶⁶ This extreme domination has, until recently, existed in many areas of the country. In social surroundings where commodities are limited, the existence of attitudes such as fatalism, distrust, lack of aspiration, lack of desire for change and a negative attitude towards outsiders seem to be logical consequences.

Theoretically, the *comunidades* were considered autonomous native settlements structured on a mixture of native and Spanish institutions. During the colonial period however, peasants living in these settlements were subjected to arbitrary treatment at the hands of Spanish and native officials, including those whose duty it was to protect them from the abuses of colonists. In theory it was possible for peasants to seek justice in the courts because legislation existed which was aimed at protecting the rights of the American Indian population. Justice could be obtained, if only rarely, but the procedure was long and hazardous. After Independence the situation of the independent rural settlements became worse and many *hacienda* owners usurped territory from the *comunidades* which were no longer protected by special legislation. In order to survive these assaults, internal cohesion was essential.

When comparing the situation of peasants living on *haciendas* under the most extreme form of domination with those of peasants living in independent *comunidades*, it could be said that commodities were scarce in both cases. In the *hacienda* situation, necessities were controlled by a small group of people, or even by one person. In the *comunidad*, the land

is under community control, while other scarce commodities are controlled by non-*comuneros*. Even though outsiders tried to dominate and exploit the *comunero*, they found it difficult to dispossess him of group lands although hard and hazardous struggles were often necessary to defend the independence of the community.

With the integration of the *comunidad* into national society, independence became more restricted because some functions were now realised by representatives of national institutions. State officials, controlled by *hacendados*, often assisted the *hacendados* in their efforts to dominate the *comunidades*. As the *comunidades* themselves became engaged in commercial activities, they were subjected to the discriminatory practices of merchants and middlemen. Greater possibilities of acquiring knowledge about the outside world by means of travel and education however, enabled them partially to counterbalance these practices.

Even though the world of the *comunero* is not free from exploitation, in comparison with the situation of the *hacienda* worker it is much less constrained. The incidence of fatalism, mutual distrust, lack of aspiration, lack of desire for change and negative attitudes toward outsiders is lower among *comuneros* than among *peones*.⁶⁷

Comuneros are generally less fatalistic, less distrustful toward fellow-*comuneros*, have more aspirations for themselves and for their offspring and are more willing to accept changes.⁶⁸ The *comunero's* attitude towards outsiders however is a more complex matter. Due to the efforts of the former government to improve the condition of the *peon*, the *comunero* shows less faith in the actions and attitudes of the government and government officials. Rather than being a permanent and consistent attitude, it seems to be a momentary reaction to a recent experience. Outsiders, even those who are not government officials are considered dangerous by both *peones* and *comuneros* and are generally treated with reserve. Whenever if an outsider is accepted, however, there is no distrustful, evasive or suspicious treatment.⁶⁹

It seems, then, that in the Peruvian case the existence of socio-cultural or socio-psychological characteristics attributed to peasants in general is closely related to their past experience and to the circumstances in which they live. *Comuneros* will show fatalism, mutual distrust and negative attitude towards outsiders; this is directly connected with their attitudes towards specific groups of outsiders. Peruvian *comuneros* have high aspirations, especially with regard to their offspring,⁷⁰ and are not only willing to accept changes which are not detrimental to their interest but, when convinced of their usefulness, will actively participate in the process of change.

Lack of deferred gratification, limited perspective of time, familism, dependency on governmental authority and lack of empathy, however, are present in the *comunidades* to varying degrees. Deferred gratification as an orientation of *comuneros* is related to their capabilities of controlling their own future development. The persistence of the *fiesta* complex cannot be interpreted as a lack of deferred gratification in spite of the fact that large sums of money are spent on non-economic items.⁷¹ Limited perspective of time is, it seems, realistically related to the concrete capabilities of the *comuneros* for planning ahead. Familism as a cultural trait is a fact, but it is related to the degree of individualisation of the *comunidad* and the need for collective action. Most *comuneros* depend on their families and, to a lesser degree, on fellow *comuneros* for support in agricultural enterprises, especially at harvest time. Therefore, where hired workers are unknown familism is a natural orientation. It can be argued further that families can have positive influences on possibilities for improvement.

Dependence on governmental authority is relative in the Peruvian case. When the government neglected the development of the *comunidades* many *comuneros*, aware of new possibilities, themselves took action towards improving their situation. As the *comunidades* became more integrated into the national society, however, *comuneros* felt that the government was responsible for improving and developing the *comunidad*. As no references are made to empathy as a peasant characteristic, it will not be considered further.

Socio-cultural characteristics attributed to peasantry in general can thus be applied to the Peruvian *comunero* in a restricted way. The existence of these traits depends on the circumstances in which the *comunero* is living, the degree of integration of the community into national society, and his level of development and past experience.

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22. Wachtel, N., *La Vision des Vaincus; Les Indiens du Pérou devant la Conquête espagnole*, Paris, 1971, pp. 127-130 and 180-184.
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24. *Idem*, p. 183, and p. 393, for the text of the Royal Decree.
25. Hemming, *op. cit.*, pp. 304-307; Wachtel, *op. cit.*, pp. 264-266.
26. Hemming, *op. cit.*, pp. 239, 260, 264.
27. *Estudio de la Comunidad Campesina de Piscobamba*; Ministerio de Agricultura, Dirección de Comunidades Campesinas, Lima, 1970, pp. 4-8.
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29. Wachtel, *op. cit.*, p. 197; Kubler, *loc. cit.*
30. Roel, *op. cit.*, pp. 278-280.
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39. Alberti, G., 'The Breakdown of Provincial Urban Power Structure and the Rise of Peasant Movements', in: *Sociologia Ruralis*, Vol. XII, 1972, p. 319.
40. Basadre, *op. cit.*, Vol. VI, pp. 91-96; Vol. X, pp. 305-306, Vol. XIV, pp. 345-346.
41. *Idem*, Vol. XIII, p. 13.
42. Sec: *Estatuto de Comunidades Indígenas del Perú*, D.S.-003 of 18.3.1961. *Nuevo Estatuto de Comunidades Indígenas*, D.S.-011 A of 27.7.1966. *Estatuto de Comunidades Campesinas del Perú*, D.S.-37-70 A of 17.2.1970.
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4. Acceptance and adoption of innovations – the proposal

The present chapter consists of three parts. In the first part the conceptual model to be used in this study will be presented. The model is based on the general information given in Chapter 2 about peasants, social change and acceptance of innovations, as well as on the concrete situation in Peruvian rural areas as discussed in Chapter 3.

The second part consists of the operationalisation of the concepts used, taking into account the situation of the regions studied. A brief justification of the choice of specific indicators, as well as some preliminary results – i.e. the distribution of some variables in the two zones – will be presented.

The last part of the chapter explains the modifications made in the conceptual model, given the above-mentioned results. The modifications are slight because the original model took into account information about the situation in the regions studied.

4.1. THE CONCEPTUAL FRAMEWORK

4.1.1. *The research objectives*

The research objectives of this study consist in determining what individual and *comunidad* characteristics account for the acceptance of innovative agricultural techniques presented by the PNDIPC. These agricultural techniques considered helpful in the improvement of the productivity of *comunero's* enterprises were: improved seeds, especially for the cultivation of potatoes, chemical fertilisers, and chemical pesticides.

In the traditional agriculture of Peru, i.e. before the Spanish conquered the country, fertilisation by means of *guano* from the islands from the Pacific was already known. During the colonial period the use of *guano* was discontinued. From that time on, cattle and sheep manure were used as fertilisers. Due to the highly developed agricultural techniques utilised in pre-colonial times, it was to be expected that seed selection was used

in order to improve the quality of the crops. These techniques are apparently lost because peasants in present-day Peru seem to use the following selection procedure: 'The smallest fruits or tubers are selected from the harvest for seed, the larger ones are sold, and the medium-sized ones are eaten.'¹ This selection method has a regressive effect on crops; as a result harvests become smaller unless some other kind of improvement is used. The use of pesticides was unknown in traditional Peruvian agriculture and was only introduced during this century.

It is necessary to state that the situation in the two regions studied differed when the PNDIPC was initiated in 1966. Even though there are no reliable statistics available to clarify these differences, some insight was gained through discussions with officials involved in the ONDC. It was found that Mantaro *comuneros* were using all agricultural techniques considered before the PNDIPC was initiated. According to estimates of the ONDC officials, approximately 10% of the region's *comuneros* were using improved seeds and 20 to 30% were using fertilisers and pesticides as early as 1966. In the Andahuaylas region, however, it was estimated that less than 2% of the *comuneros* were using these techniques in 1966. Thus in the Mantaro region the PNDIPC activities were in fact promoting the use of techniques which had already been introduced by others, whereas in the Andahuaylas region it can be said that these techniques were introduced to the *comuneros* by the programmes of the PNDIPC. In both regions it is possible that, for individual *comuneros*, these modern agricultural techniques were innovations in the sense that until the beginning of the extension programmes they were not familiar with them.

As the innovations were already known in the region, and given the *post hoc* nature of the present data, models normally used in research concerning the introduction and diffusion of innovations do not apply. It becomes necessary then, to design a model that takes into account the peculiarities of the two regions under study. The concepts to be used will be derived from the social interaction model, and the operationalisation will take the actual situation of Peruvian *comuneros* into account.

4.1.2. *The conceptual model*

In order for a *comunero* to use an innovation, it is necessary that the following conditions be fulfilled:

- A. The innovation must be available to him;
- B. he must obtain adequate knowledge concerning the innovation;
- C. he must be in a condition to use it successfully;
- D. he must be willing to take the risks involved in using it.

A and B. It is obvious that an innovation must be available in the social surroundings of the *comunero* in order for him to be able to use it.* The fact that an innovation is available is a characteristic of the environment in which a *comunero* is living. In general it is to be expected that information concerning an innovation, as well as its availability, will be related to the degree of integration of the *comunidad* into the national society. The more integrated the *comunidad*, the more readily available modern techniques will be. When speaking about integration into the national society, reference is made strictly to the *comunidad*, which is considered more integrated: 1. if national institutions are present within its territory and 2. if it has adequate connections with the outside world. The geographical accessibility of the *comunidad* greatly influences the possibilities its inhabitants have of contact with the outside world, either by means of outward travel or visits from outsiders. These two characteristics are, of course, not sufficient to account for knowledge about and use of innovations. They are, however, conditions favourable to the presence of this knowledge and to its subsequent use.²

In the case of the PNDIPC, there is an additional factor which should be considered. As was shown in Chapter 1, within each ZAC sub-zones were delineated which received special attention from the state agencies involved. In each of the regions studied *comunidades* located in the so-called intensive action sub-zones were detected. In these *comunidades* all institutions of the PNDIPC were active. Thus it can be expected that *comuneros* in these intensive action sub-zones were in a better position to obtain information about innovations as well as the supplies necessary to implement the innovation desired. Thus those *comuneros* living in *comunidades* which are more integrated into the national society, and those living in *comunidades* located in intensive action zones, have more likelihood of acquiring the necessary knowledge concerning innovations.

At the individual level there are also characteristics which will have a positive influence on the propensity to obtain knowledge concerning innovations present within the social surroundings.

Rogers³ and his associates have analysed a great number of innovation studies and proposed a series of individual characteristics related to the capacity for acquiring knowledge concerning innovations. The propositions or empirical generalisations presented contrast early knowers with late knowers. In this study it is supposed that the same characteristics

* Availability refers to two different elements. Firstly; information about the innovation must be present in a form that is accessible to the *comunero*; and secondly: the material elements, e.g. the seeds, the fertilisers, etc.. must be available when they are needed.

which account for the difference between these two groups can also be extended to those of knowers and non-knowers. These are: education; higher social status; greater exposure to mass media; more social participation, and being more cosmopolitan. It is said that the higher the degree of possession of each of these characteristics, the higher the propensity for an individual to acquire knowledge concerning innovations.

C. In order to be able to use innovations successfully, certain conditions must be fulfilled. The use of innovations is meant to improve the productivity of the agricultural enterprises of *comuneros*. Their use involves costs which must be compensated for by the higher yield from their fields. Factors related to the likelihood of this compensation are objective structural conditions such as the existence of an adequate market system with a reasonable price level, free from the arbitrary intervention of outsiders.⁴ When these structural arrangements are satisfied a set of subjective characteristics determines whether the *comunero* will perceive whether the possibilities which these arrangements present are positive or not.

Closely related to the favourable conditions for use of innovations are the amount of land available to a *comunero*, its fragmentation pattern, and the land tenure system. The size of the agricultural enterprise is of obvious importance. The more land a *comunero* has available the higher is his likelihood of obtaining better results given a certain yield/gain relation. In addition to land size, one must take into account the fragmentation pattern. As a result of inheritance rules, in Peruvian rural areas the amount of land available to a *comunero* often consists of a large number of small plots spread out over a relatively large area; this makes the use of innovations a costly operation.⁵ Thus unless the perceived possibility of gain is high⁶ the willingness to use innovations will be low. The land tenure system also affects possibilities of using innovations. Those who have a more or less permanent right over the land are more willing to engage in the use of improvements than those who have little or no control over the land they work.⁷ In the case of the two regions studied, this factor is of little interest because in today's *comunidades* most of the arable land is owned individually, while the remaining communal lands are pastures for collective use and are either rented or allotted to individual *comuneros*.

D. Willingness to engage in processes of social change and thus in using innovations is normally deduced from so-called socio-cultural or socio-psychological peasant characteristics.⁸ Sometimes the analysis is restricted to the impact of empathy, fatalism and cosmopolitanism,⁹ but as

the set of characteristics presented in Chapter 2 is said to form the core of peasant sub-culture, one can expect that they also influence the willingness to use innovations.* Traditionally orientated *comuneros* can be expected to behave more reticently in the use of innovations presented than those who are more modern-orientated. It has been shown¹⁰ that the so-called traditional orientations can be changed, thereby modernising traditional people. Factors which can cause the modernisation of orientations are education, exposure to mass media, urban contacts, and social participation. The common base of these factors is the possibility they present for the acquisition of new knowledge and involvement in new experiences that broaden the *comunero's* world view. He will consequently be more open-minded and more willing to accept new patterns of behaviour. Thus any peasant or *comunero* who has a high level of education, high exposure to mass media, urban contacts and a high degree of social participation, acquires a broader world view; this causes him to change his orientations from traditional to modern, and consequently induces him to use innovations which are presented more readily.

In order to evaluate correctly the pertinence of peasant orientations one must consider the concrete historical situation of the peasant or *comunero*. In this study the socio-psychological characteristics of peasants which have been considered are: a. fatalism; b. familism; c. faith in fellow *comuneros*; d. cosmopolitanism or localism; and e. aspirations for one's children. They were chosen because they were expected to be the concepts most helpful in assessing the willingness of peasants to use innovations. In contrast to common practice in the social sciences, it is not expected that these orientations will necessarily be related in the same manner to willingness to use innovations. It is expected that, according to the existing situation in each region, the prevalence of one of the categories of each of the characteristics will be plausible. In the following part of this section for each of the characteristics considered it will be stated in what form it will predominate in each region.

a. Fatalism is described as the tendency of a *comunero* to believe that he himself cannot change his fate or situation. He considers his fate as being determined by forces he cannot control, while the non-fatalist or activist

* The characteristics are:

mutual distrust, fatalism, failure to use innovations, lack of aspirations, lack of deferred gratification, limited time perspective, familism, dependency on authority, localism and lack of empathy. According to social science literature they all refer to a traditional-modern dimension.

considers it within his capabilities to do something to improve his condition. Due to the fact that the Mantaro region has been better integrated into the national society, the *comuneros* of this region will be more action-orientated than those of the Andahuaylas region. Additionally Mantaro *comuneros* have a higher level of education, more outside contacts and more experience with modern technology either in agriculture or in industry; it therefore seems logical that the proposition presented above will prove correct.

b. Familism is normally considered the tendency to give preference to one's immediate kin-group, subordinating individual goals. In rural areas of Peru, the kin-group is important because when *comuneros* need outside help to till their lands they must resort to help of their family and to a lesser degree, to that of fellow *comuneros*.¹¹ In addition, the family helps the *comuneros* to cope with costs involved in ceremonial obligations within the *comunidad*.¹² Even though there exists a strong bond between family members in rural Peru, it cannot be said that individual goals are subordinated to those of the family. The tendency to rely first on the kin-group can be seen as a traditional pattern, in which the survival of the individual depended on the help he received from relatives or fellow *comuneros*. The mutual obligations of *comuneros* towards family and fellow *comuneros* permitted them to survive as individuals as well as a group. Due to the impact of a national culture which stresses individualism these obligations have become less binding and mutual aid to other *comuneros* in agricultural activities has virtually disappeared, whereas mutual obligations towards family and fictitious relatives have persisted. Thus in isolated regions familism, understood as the tendency to act within the family group, is a necessity for the well-being of the individual *comuneros*. Finally, when a *comunidad* is more integrated into the national society it is more likely that its resident *comuneros* will act individually. As the Mantaro region is more integrated into the national society we can expect to find that *comuneros* of that region will show less familism.

c. Faith in fellow *comuneros* is also closely related to the degree to which the *comunidad* is integrated into the national society, and also the degree of competition existing among *comuneros*.

The Mantaro region is more integrated into the monetary economy of the country and *comuneros* participate in it as individuals. In the Andahuaylas region, however, *comunidades* have only recently become independent from surrounding *haciendas*, mainly as a result of their own ef-

forts. As the institutional development of these *comunidades* is weak and success is dependent on communal efforts, *comuneros* of the Andahuaylas region can be expected to trust fellow *comuneros* more than those in the Mantaro region.

d. Cosmopolitanism as treated by social scientists can refer either to actual outside contacts – mostly with urban centres – or to the orientation of the peasant with reference to the outside world, the national society, or urban centres. The Mantaro region is closer to Lima and, given the fact that residents of the area have been more involved in activities of the national society, it can be expected that they will have more outside contacts than *comuneros* from the Andahuaylas region, and will therefore display a more cosmopolitan attitude.

e. Mantaro *comuneros* have given ample evidence of high aspirations towards the improvement of their condition and that of their children. No such evidence exists in the Andahuaylas region. In this case, however, the method for measuring aspirations is important. Aspirations can be measured using an absolute criterion (i.e. the level of education desired for children), or a relative one which measures aspirations on a gliding scale (i.e. comparing a person's situation with the situation desired for his children). The latter approach has been used in this study. Therefore it is not certain beforehand in which region the *comuneros* will show the higher degree of aspirations for their children. One can argue that the Andahuaylas region is relatively backward and the situation of the *comuneros* is relatively bad. Although objectively their aspirations are not high, they do desire a better future for their children and it can even be expected that they have higher aspirations than Mantaro *comuneros*. On the other hand it can be argued that even though Mantaro *comuneros* enjoy a relatively satisfactory situation, they are more involved in the national society and will still have higher absolute aspirations for their offspring.

The hypotheses obtained with regard to the socio-psychological characteristics of the *comuneros* can be summarised as follows:

- a. Mantaro *comuneros* will be less fatalistic than Andahuaylas *comuneros*.
- b. Mantaro *comuneros* will be less familistic than Andahuaylas *comuneros*.
- c. Mantaro *comuneros* will have less faith in fellow *comuneros* than Andahuaylas *comuneros*.

- d. Mantaro *comuneros* will be more cosmopolitan than Andahuaylas *comuneros*.
- e. There is no clear indication in which region the *comuneros* will show a higher degree of aspirations for their children.

As stated by Rogers,¹³ peasant-type orientations have a negative influence on willingness to participate in processes of social change. Those who possess traditional orientations will be less willing to participate in social change. Empirical evidence¹⁴ indicates that there exists some relationship between orientations and the acceptance of innovation, but this is still inconclusive. Of the five orientations studied only two can be related logically to the willingness to participate in social change programmes: these are fatalism and aspiration. The degree of fatalism is negatively related to the use of innovations, whereas aspirations are positively related to it. As the other three attitudes cannot logically be related to a tendency to use new ways, their relationship with the use of innovations can only be indirect. Thus the willingness to participate in social change processes can be deduced from the lack of fatalism and from a high degree of aspirations for one's offspring. The greater willingness to participate in social change processes will be reflected in the higher propensity to use the innovations. However, the hypothetical interrelationship of the five socio-psychological elements considered will be verified in the preliminary analysis. Depending on the results, either an overall index on several partial indices will be used.

Once the *comunero* has knowledge about the innovations presented and is willing to take the risks involved, and provided that all other relevant factors are favourable he can begin to use them. Continued use depends on the results obtained, especially the increased productivity. If results are favourable (higher yields, higher income, etc.) it is likely that the *comunero* will continue to use the innovation as part of his normal routine. A distinction is made in this study between initial and continued use of an innovation. The terms 'acceptance' and 'adoption' are used to describe these two phenomena. Acceptance is the use of an innovation once, while adoption implies its continued use. Thus, once an innovation has been accepted adoption depends on the consequences it has had for the *comunero*.

At the individual level the model proposed is based on several blocks of variables. Initial factors such as education, social participation, use of mass media, social status and wealth are said to have a positive influence on knowledge concerning innovations, their acceptance and willingness to adopt them. Age¹⁵ is also mentioned as a relevant factor and, although

younger people are expected to have a higher propensity towards the acceptance of innovations, the empirical evidence is inconclusive. Age is considered a factor in the Andahuaylas region however, because it seems to be a relevant characteristic. It must be recalled that until 1935 Andahuaylas *comunidades* were virtually dominated by *hacendados* and the possibility of development was minimal. Thus older *comuneros* lived under highly unfavourable conditions, whereas younger ones have known less oppressive situations. In general it is to be expected that age will be related indirectly to the acceptance of innovations because younger people tend to have higher levels of education. In addition to these factors, the amount of land held, fragmentation patterns, and the tenure system have an indirect influence on the propensity to accept innovations. These will be called favourable conditions. Schematically, the model can be presented as shown in Figure 1.

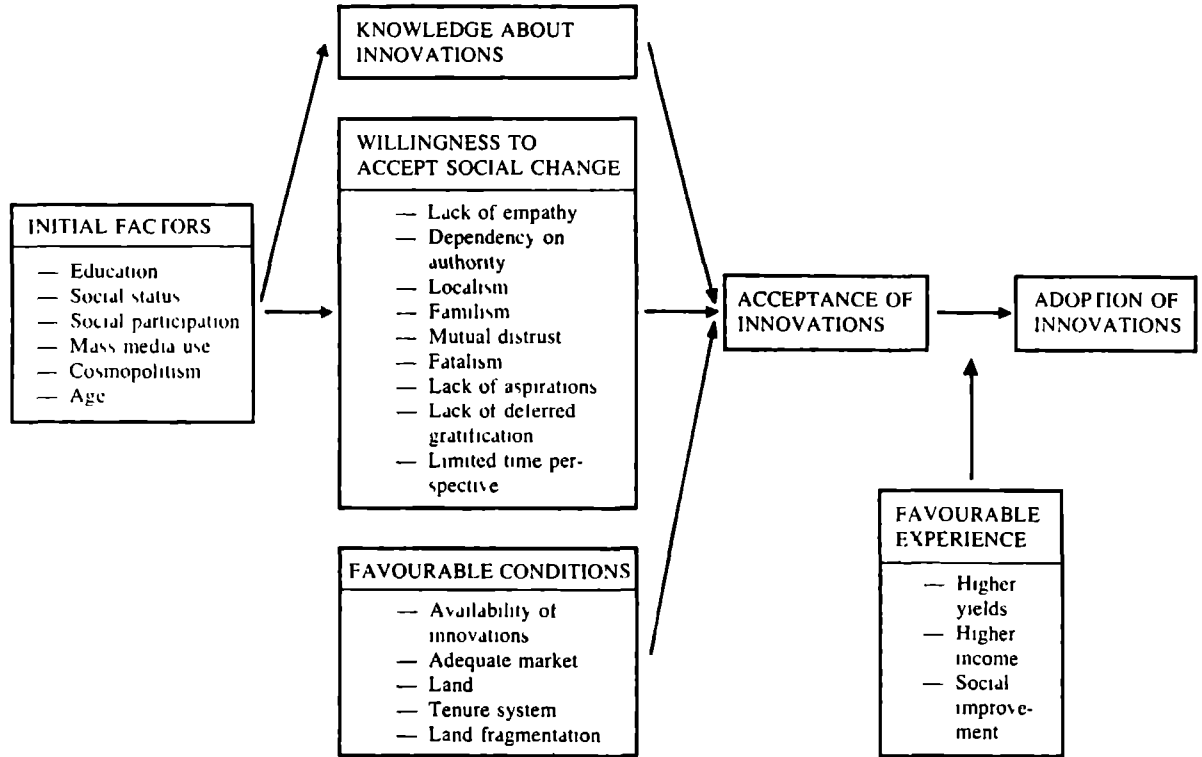
Several observations must be made before presenting the operationalisation of the concepts used.

a. The initial factors are not of the same status. Some can be considered antecedent variables in relation to the others. For example, education and age are antecedent to mass media exposure. It becomes necessary, then, to distinguish within the group of initial factors those which are real antecedent variables and those which can be considered dependent on them.

b. The measurement of social status and wealth in rural areas poses two problems. In the first place it must be taken into account that the Peruvian rural areas are a mixture of a traditional situation of subsistence agriculture with little outside commercialisation and a modern situation where the *comunidad* forms part, although only marginally, of the Peruvian national society. The characteristics to be considered must therefore reflect this dual situation.* In the second place, land is considered by the rural population as a yardstick of wealth and prestige.¹⁶ There are thus two conflicting views as to the role of land in the process of acceptance of innovations. It is considered in some cases to be an initial factor and in others to be a favourable condition. The normal procedure is to consider it an initial factor, meaning that it has a direct relationship to

* Later on, when presenting the operationalisation of the concepts, the dual character of the *comunero* situation will be evident.

Figure 1. Schematic representation of the variables involved in the modified acceptance/adoption model



acceptance of innovations. If it is considered a favourable condition, the implication is that it has only an indirect relationship to acceptance of innovations. As is clear from the form in which the model is presented, land is considered a favourable condition and not an initial factor. The reason is that the amount of land possessed within an agrarian sub-society is not necessarily related to those factors which contribute to a broader world view which induces the *comunero* to use new methods. On the contrary, it can be argued that a large amount of land yields enough; the incentive to improve agricultural procedures is therefore lacking. Education, however, is expected to be the main predictive characteristic for the acceptance of innovations, and as it is not expected that the level of education will be related to the amount of land possessed it seems logical to consider land as a favourable condition.

c. Social participation normally means¹⁷ participation in activities of the national or urban society. However, as the *comunidad* forms a social unit in its own right, *comuneros* are bound to participate in its activities. Preference is given to participation in non-communal or urban-type activities because it is thought that the *comunero* will move away from his *comunidad* as he acquires new patterns of behaviour. In addition to participation in the activities of the urban world, it is necessary to consider participation in activities of the *comunidad* itself. Participation in communal activities will give an indication of the degree of integration of the *comunero* within his own *comunidad* for it is possible that, through contacts with fellow *comuneros* he will also acquire new knowledge. Additionally it must be remembered that communal activities are mainly the maintenance or improvement of communal facilities such as roads, irrigation channels, construction of communal building, etc., which will bring the *comunero*, although perhaps only indirectly, into contact with the outside world. For this reason two indices of social participation will be used, one strictly related to communal activities and another which takes into account direct participation in relevant outside activities.

4.2. THE OPERATIONALISATION AND SOME PRELIMINARY RESULTS

In the following sub-sections of this chapter the operationalisation of the concepts used, together with some preliminary results, will be presented. These results consist mainly in percentage distributions of the variables used. The first part deals with *comunidad*-level variables, inte-

gration into the national society, location in the sub-zone of intensive action and the degree of internal integration. The second part deals with variables at an individual level. The results of the measurement of these variables are presented for all *comuneros* living in the *comunidades* being studied, independent of whether or not they are engaged in agriculture.

Location of a *comunidad* within the intensive action zone of the ZAC is used as an indicator because of the obvious availability of innovations and because many other state agencies tried to introduce modifications into them. Selection into the intensive action zone was made by officials of zonal offices of the *Oficina Nacional de Desarrollo Comunal*. The number of *comunidades* selected was decided mainly on the basis of practical considerations which will not be discussed here (see Appendix 2).

4.2.1. *Variables at the comunidad level*

In order to measure the degree of integration of the *comunidades* into the national society an index was formed. This integration into the National Society Index (INS) was constructed on the basis of four sub-indices which were considered to reflect the relevant structures within Peruvian society into which the *comunidades* could be incorporated. These sub-indices include:

- A. Integration into the national administrative system (INAS);
- B. Integration into the national educational system (INES);
- C. Integration into the national monetary market (INMM);
- D. Integration into the national road system (INRS).

A. *Integration into the national administrative system*

a. Peruvian national territory is divided into *Departamentos*, each *departamento* is divided into *Provincias* and each *provincia* consists of *Distritos*. Each *distrito* has a capital.

Even though the *distrito* is the smallest administrative unit, it is usually made up of several settlements. Each settlement is supposed to be integrated into various national administrative systems. The most important of these is the departmental administration which is under executive authority. In each *departamento* there is a *prefecto*, in each *provincia* a *sub-prefecto*, in each *capital de distrito* a *gobernador* and in all settlements where it is thought convenient there is a *teniente gobernador*. As the degree of integration of a settlement into this system is higher, the authority will be of a higher rank. As no objective rules exist to determine when a settlement will be raised to a higher category, a raise in

status greatly depends on the consciousness the population has about its situation, for settlement residents must themselves appeal to the executive authority for promotion to a higher category.¹⁸

Comunidades are at best *capitales de distrito* and therefore the highest possible authority of the national political system who can be present is a *gobernador*. Those *comunidades* that are not in this category have either a *teniente gobernador* or no national political authority at all. The integration of a *comunidad* into departmental administration will be measured by the presence within its boundaries of authorities of the national political system.

b. The Peruvian Constitution requires that all settlements be integrated into the judicial system. In each settlement there is one of two types of judge. The *Juez de Paz No-Letrado* is a rural judge, not necessarily a lawyer, who is over 21 years of age and a resident of the settlement where he is to function. He is required to have a complete primary education, to have assets or a recognised profession and to speak the local language. A *Juez de Paz Letrado* must be connected to the legal professions, be at least 21 years old, and have a minimum of two years' experience as a judiciary assistant or as a court lawyer. In the *comunidades* studied either of the two *Jueces de Paz* as the highest representative of the judicial system may be found; however, in some cases there may be no judge at all. It is also possible that a single settlement (with more than 2,000 inhabitants) may have both types of judge within its territory. The presence of representatives of the judiciary system is related to the size of a *comunidad*. Its integration into this system can be evaluated, then, by the rank of the judge present in the community.

c. A third administrative division is of importance in Peru. The national territory is theoretically divided into *municipalidades* which are supposed to be civic organisations, independent of the central government. This organisational structure is inherited from the Spanish colonial period and hardly functioned during the republican era. During some periods, the *municipalidad* was considered the backbone of real democratic organisation of the republic, whereas during others it was considered detrimental to effective government. In rural areas this civic organisation functions in the following manner. The highest authority is the *Alcalde Municipal* who resides in the main settlement of the *municipalidad*; he can be represented by an *Agente Municipal* in adjoining settlements. The degree of integration of a *comunidad* into this system can also be evaluated according to the presence and rank of the municipal authority.

B. *Integration into the national educational system*

The Peruvian Constitution gives the state the responsibility for the education of its citizens and their children; primary education is compulsory. Each settlement with a potential of thirty students is to have a school and each *capital de distrito* a complete primary school. As the rural areas of the country were neglected by former governments, it was found that *comuneros* themselves had taken over the task of providing basic education for their children.¹⁹ They either built a school with communal labour and hired a teacher or pressured state authorities to provide them with adequate schooling. Consequently there has been a tendency for each community to have its own primary school. The degree of integration of a community into the national educational system then, can be evaluated by the presence of schools and the level of instruction offered.

C. *Integration into the national monetary market*

In order to measure the degree of integration of the communities into the national monetary market, existence of shops in the community and the scale of the main crop cultivated will be used as indicators. It will be determined whether the main crop is sold outside the *comunidad*, either to middlemen or merchants who come to the *comunidad*, or directly by *comuneros* to an outside market. Thus a *comunidad* that has both – i.e. has at least one shop and is also engaged in outside commerce – will be considered more integrated than one that has only one of these characteristics. Commerce within the *comunidad* is excluded as this type of transaction often takes the form of barter.

D. *Integration into the national road system*

One of the main reasons for underdevelopment of the *comunidades* is the fact that they lack adequate road connections with the outside world. Even though as early as 1920²⁰ the Peruvian government issued a law obliging all able-bodied men to work for a certain number of days per year on road construction, the burden of execution rested on the *comune-ro* and tenant farmer, while the benefits were reaped by the non-peasant sector of the population. The existence of roads then, will also be used as a standard to evaluate the integration of a *comunidad*.

Due to differences in the degree of involvement of *comunidades* in the national society, it is expected that those of the Mantaro region will be more integrated into the several national systems than those of the Andahuaylas region.

As can be seen from Table 1 for 1966 and for 1972, Mantaro *comunidades* show a higher degree of integration into the afore-mentioned systems.

Table 1. Percentage of *comunidades* without political, judicial, or civic authorities, primary schools, shops, outside trade of potatoes, and roads in 1966 and 1972; Andahuaylas (n=28) and Mantaro (n=66)

	Political author- ities	Judicial author- ities	Civic author- ities	Prim- ary schools	Shops	Out- side trade	Roads
<i>Andahuaylas</i>							
1972	13	26	56	37	38	85	43
1966	60	60	66	68	44	*	63
<i>Mantaro</i>							
1972	5	0	30	20	5	32	5
1966	34	21	49	38	29	*	37

* Only obtained for 1972.

A considerable increase can be observed in the formal integration of Andahuaylas *comunidades* during the six years of PNDIPC operation. Generally speaking, the degree of change on a *comunidad* level is higher in Andahuaylas, but this is due to the fact that the level of integration in the Mantaro region was higher than that in Andahuaylas in 1966. In order to construct indices to measure the integration of *comunidades* into the different national systems, information for both 1966 and 1972 has been used.

Integration into the national administrative system

Integration into the national administrative system is measured by an index formed by combining the degree of integration into the political system with that of the judicial system. Municipal organisation is excluded as an indicator because it does not depend on the central government and the present government apparently does not attach much importance to it. The highest degree of integration is attributed to those *comunidades* which in 1966 had representatives of both the political and the judicial systems. Those which acquired one or both of these during the period 1966-1972 are assigned to the next degree of integration, and those which in 1972 had neither are assigned the lowest degree.

Integration into the national educational system

Integration into the national educational system is evaluated by the presence of a complete primary school within the *comunidad*. Thus the highest degree of integration is assigned to those *comunidades* which had a complete primary school in 1966, the next degree to those which obtain-

ed schools during the six-year period, and the lowest degree to those *comunidades* which did not have a complete primary school in 1972.

Integration into the national monetary market

Integration into the national monetary system is evaluated by the existence of shops in the *comunidad* and by the degree to which *comuneros* are engaged in external commercialisation of their main crop. The highest degree of integration is assigned to those *comunidades* with at least one shop and whose inhabitants were engaged in external commerce. The next degree is assigned to those *comunidades* which had either a shop but no outside trade or had no shop but did have outside trade. The lowest level is attributed to those *comunidades* without shops and without external commerce.

Integration into the national road system

Integration into the national road system is measured by the presence of roads. Those *comunidades* accessible by motor roads in 1966 are assigned to the highest level, those that became accessible during the six-year period the next level, and *comunidades* still inaccessible to motor traffic in 1972 the lowest level.

Internal integration

Internal integration is measured by the number of *comuneros* who normally participated in communal activities up to 1972, as well as by the community leaders' opinions as to whether it was easier to organise communal activity in 1972 as compared with 1966. These indicators seem to be appropriate as communal activities are organised for the common benefit of the population. When *comuneros* come into contact with the outside world, there is a tendency to refuse to participate in communal activities. This resistance of the population to participate is based on acquired opinions as to the inappropriateness of communal labour. The Peruvian Constitution explicitly forbids obliging a citizen to work without paying him a proper wage. In addition, as *comunidades* become more integrated into the national system, *comuneros* consider it a state obligation to provide and maintain communal facilities. The highest degree of internal integration is assigned to those *comunidades* whose leaders declared that in 1972 it was more difficult, or as difficult as in 1966, to assemble *comuneros* for communal activities and in which – according to the leaders – the majority of them participated. The next degree of integration is assigned to *comunidades* in which it was said to be easier to assemble people for communal labour and in which the majority took part. The lowest degree is assigned to *comunidades* in which half or less

than half of the *comuneros* participated, irrespective of the perceived change in difficulty of assembling them.

No prior information was available about the comparative degree of internal communal integration in these two contrasting zones. These two regions have had completely different historical experiences as regards *comunidad* structure. The Mantaro region has a long tradition of operating within the *comunidad* structure, and the *comunidad* as an institution has survived a considerable amount of social change. On the other hand, Andahuaylas has a long history of captive communities and *haciendas*. Independent communities have only recently come into existence, mainly through the efforts of today's *comuneros* or their parents. This fact makes it impossible to predict which region will have a higher degree of internal integration.

Table 2. Percentage distribution of comunidades in Andahuaylas and Mantaro according to: degree of integration into the national administrative system; degree of integration into the national road system; degree of integration into the national educational system; degree of integration into the national monetary market; degree of internal integration

	<i>Integration national administrative system</i>		<i>Integration national road system</i>		<i>Integration national educational system</i>		<i>Integration national monetary market</i>		<i>Internal integration</i>	
	<i>Andahuaylas</i>	<i>Mantaro</i>	<i>Andahuaylas</i>	<i>Mantaro</i>	<i>Andahuaylas</i>	<i>Mantaro</i>	<i>Andahuaylas</i>	<i>Mantaro</i>	<i>Andahuaylas</i>	<i>Mantaro</i>
Low	53	14	46	17	36	15	43	20	25	23
Medium	11	35	18	20	32	30	43	50	36	44
High	36	51	36	63	32	55	14	30	39	33
Total	100	100	100	100	100	100	100	100	100	100

In Table 2 a marked difference can be observed between the Andahuaylas and Mantaro regions, particularly in regard to the degree of integration into national systems. Andahuaylas *comunidades* are less integrated into national systems than those of the Mantaro region. There is no observable difference however, in the degree of internal integration between the two regions.

In order to verify whether the partial indices related to the integration of the sub-systems considered could be summarised by one overall integration index, denominated 'integration into the national society', the cor-

relation matrices of the two regions were submitted to elementary linkage analyses.²¹ It was found that the four external integration indices could be summarised by one overall index. This index (INS) was formed by adding up the scores of the partial indices after they had been dichotomised, taking the lowest level of integration as one category and combining the remaining levels into another. Due to the fact that there were statistically significant differences at the lowest level in each of the indices, when comparing the two regions this category was taken as the relevant one.

Table 3. Integration indices for Mantaro and Andahuaylas; percentage for lowest degree of integration: correlation matrix

		<i>Mantaro</i>				
		<i>INAS</i>	<i>INRS</i>	<i>INES</i>	<i>INMM</i>	<i>II</i>
<i>Andahuaylas</i>	%	14	11	15	20	23
	<i>INAS</i>	53	— .003	.239	.136	— .206
	<i>INRS</i>	46	.311	.422	.174	.151
	<i>INES</i>	36	.316	.533	.167	.029
	<i>INMM</i>	43	.104	.630	.380	.061
	<i>II</i>	25	.431	.280	— .047	— .040

In Table 3 it can be seen that in the Andahuaylas region there exists a positive correlation between the internal integration of the *comunidad* and integration into the national administrative and road systems. Thus, for the *comunidades* in this region, the higher the integration into the national society, the higher the internal integration.

In the Mantaro region however, there is a negative correlation between internal integration and integration into the national administrative system, whereas there is a low correlation between internal integration and integration into the national road system.

The contrasting results between the role of integration into the national administrative system and internal integration can be explained by the different historical experiences undergone by the two regions. Mantaro *comunidades* have operated independently, without interference from national authorities, because they have been *comunidades* since the colonial period. Andahuaylas *comunidades*, on the other hand, needed the support of national authorities to obtain their status as independent *comunidades*. Consequently, because of the lack of a *comunidad* tradition, the local representatives of national institutions have a positive influence on the structure and functioning of these *comunidades*.

4.2.2. Individual level variables

A series of variables which is supposed to have a direct or indirect influence on the knowledge concerning innovations, the willingness to use them and their subsequent acceptance and adoption, has been proposed by social scientists. These so-called initial factors are:

- A. age;
- B. level of education;
- C. social participation;
- D. use of mass media;
- E. cosmopolitan orientation;
- F. social status and wealth.

A. *Age* was measured as the number of years completed at the time of the survey. In order to have a uniform criterion, July 1, 1972 was used as a point of reference. As the samples consisted of male heads of households, the age range fluctuated between 18 and 60 years, the upper limit being fixed arbitrarily. The respondents were classified in four age groups to facilitate analysis.

Table 4 shows that the Mantaro population is older than that of Andahuaylas. 37% of the respondents in the Mantaro region are under 40 years of age while 52% of the respondents in Andahuaylas fall into this age group. The explanation for this difference is that, due to the proximity of Mantaro *comunidades* to mining centres, and its relative accessibility, the younger population has left the *comunidades* and migrated to the mining sites and/or the coast. Furthermore, the Mantaro region has a more diversified occupational structure than the Andahuaylas region and consequently it is to be expected that younger people will continually be moving away from the agrarian sector.

Table 4. Percentage distribution of level of education according to age; Andahuaylas and Mantaro, 1972

Age	Andahuaylas					Mantaro				
	18-30	31-40	41-50	51-60	Total	18-30	31-40	41-50	51-60	Total
No schooling	21	40	62	72	47	2	8	14	18	12
Medium	49	40	30	25	37	36	53	42	42	48
High	30	20	8	3	16	62	39	44	44	40
Total	27	26	30	17	318	14	23	28	35	443

B. *Level of education* was measured according to years of schooling completed by the respondents. In order to facilitate analysis, the respondents were classified into three groups: 1. those without formal education; 2. those who had not completed primary school; and 3. those who had completed primary school or had some secondary education. As expected, respondents from the Mantaro region have a higher level of education than those from the Andahuaylas region. 12% of Mantaro respondents have no schooling versus 47% for Andahuaylas, and 40% have either completed primary school or have some secondary education versus 16% in Andahuaylas.

The difference in educational level between respondents from Mantaro and Andahuaylas is more striking if analysed in relation to the age of the respondents. As can be seen in Table 4 the oldest age group in the Mantaro region has the same incidence of no schooling as the youngest group in Andahuaylas. If these two groups are compared with regard to completed primary or some secondary schooling, the incidence of at least completed primary education is higher in the Mantaro group, disregarding the sampling fluctuations, than that of the Andahuaylas group. These results clearly reflect differences between the two regions.

C. *Social participation* is measured by two different indices. In order to measure the participation of *comuneros* in internal community activities, a 'communal participation' index was devised which combines two indicators. The first indicator is attendance at communal assemblies in 1972, while the second indicator reflects the number of other communal activities in which the respondent participated that year. The correlation between the two indicators is .248 for the Andahuaylas region and .303 for the Mantaro region. These indicators were combined so that the index formed ranged from non-participation (indicating that respondents neither attended communal assemblies nor participated in other communal activities) to high participation (where respondents attended communal assemblies and had participated in at least two other communal activities during 1972).

The remaining categories indicate those who participated in one and two communal activities respectively. Although no major differences between the two regions are in evidence from the index, high participation for the Mantaro region is 45% whereas the corresponding value for the Andahuaylas region is 35%. This indicates that, even though there is no difference in the number of *comuneros* participating in communal activities, those of the Mantaro region participated more intensely.

In order to measure the participation of *comuneros* in other activities

Table 5. Percentage distribution of participation in community activities according to general participation; Andahuaylas and Mantaro

General participation	Andahuaylas			Total
	Non-participation	Communal authority participation	Communal and non-communal participation	
Communal participation				
Non-participation	18	8	1	12
Low participation	21	19	24	20
Medium participation	32	35	22	33
High participation	29	38	53	35
Total	43	48	9	318

General participation	Mantaro			Total
	Non-participation	Communal authority participation	Communal and non-communal participation	
Communal participation				
Non-participation	18	3	8	8
Low participation	22	13	10	15
Medium participation	28	35	29	32
High participation	32	49	53	45
Total	26	57	17	442

available to them, a 'general participation' index was devised in order to take into account various types of participation: participation in the internal authority structure of the *comunidad* in which all male *comuneros* are expected to participate;²² participation in the various peasant organisations which unite *comunidades* on a regional basis; participation in national associations such as political parties and the association of ex-draftees of the armed forces (*Asociación de Licenciados*); and participation in the lecture series organised by the PNDIPC, either on a community or regional level, were considered. These items were classified according to their closeness to community level participation using the following categories: non-participation; participation in the communal authority structure; and participation in non-communal activities. From this classification, the degree of general participation was obtained. As in each

region only 5% of the respondents had been active both in the communal authority structure and in non-communal activities, this category was combined with participation in non-communal activities. The three categories used, then, were: non-participation, participation in the communal authority structure, and participation in the communal authority structure and/or in non-communal activities, i.e. participation in communal and non-communal activities.

Comparing the results obtained, a marked difference between the two regions is evident. In Andahuaylas, 43% of the *comuneros* did not participate in any of these activities, whereas in Mantaro 26% are non-participants. In the Mantaro region *comuneros* participate more in the authority structure and non-communal activities than those from the Andahuaylas region.

These indices measure two different types of social participation in relevant activities and institutions. When correlating the two, it appeared that for both regions *comuneros* who have participated in internal authority structures and have been engaged in non-communal activities have the highest rate of intense participation in communal activities. This indicates that there seems to be no contradiction between participation in internal activities and participation in outside activities which are available to *comuneros*.

D. *Use of mass media* was measured by combining the following indicators: reading a newspaper at least once a week and listening to the radio daily. The correlation between these two indicators is .284 for Andahuaylas and .130 for Mantaro. As expected *comuneros* from the Mantaro region read more newspapers than those from the Andahuaylas region (76% and 31% respectively). They also listened more to the radio than those of Andahuaylas (75% and 49% respectively). Therefore the combination of the two indicators in the 'mass media participation' index shows the same tendency. Using three categories for mass media participation the following distribution is obtained:

- *Low participation*: neither reading newspapers nor listening to the radio - 42% for Andahuaylas and 25% for the Mantaro region.
- *Medium participation*: reading newspapers or listening to the radio - 36% for Andahuaylas and 15% for Mantaro.
- *High participation*: reading newspapers and listening to the radio - 22% for Andahuaylas and 60% for Mantaro.

E. *Cosmopolitan orientation*. Two different indices were devised to measure actual outside contacts and cosmopolitan orientation. *Actual*

outside contacts were measured by counting the number of trips made outside the geographical area of the *distrito*. In general, *comuneros* did not travel outside their *distrito* frequently. In the Andahuaylas region 20% of the *comuneros* had travelled outside their *distrito* in 1972, while in the Mantaro region 29% had made such trips.

In order to measure *cosmopolitan orientation*, an index was devised to measure its opposite, localist orientation. This was done because it does not seem correct to measure the cosmopolitan orientation of rural people whose knowledge of and contacts with urban centres are limited. To make sure that the items used in the index were relevant to the respondent's circumstances two options were presented. The first item was the question: 'Have you ever considered leaving your community?', and the second was: 'If you were given land in the jungle would you be willing to live there?' In the Andahuaylas region, 91% of the respondents said they had never considered leaving the community and 72% said they were not willing to move to the jungle. In the Mantaro region, 90% said they had not considered leaving their community but only 49% said they were unwilling to migrate to the jungle. The correlation between the two indicators for Mantaro is relatively low: .072, whereas for the Andahuaylas region it is .178. Combining these items into one index, 68% of Andahuaylas *comuneros* expressed a localist preference, i.e., they preferred to stay in their communities, while in the Mantaro region 45% expressed localist tendencies. The remaining patterns were lumped together into one category, cosmopolitanism.

It is to be expected that a positive relationship exists between outside contacts and cosmopolitan orientation. People with outside contacts acquire knowledge concerning the outside world which is a requisite for the development of cosmopolitan orientation.

Table 6. Percentage distribution of cosmopolitan orientation according to outside visits; Andahuaylas and Mantaro

<i>Orientation</i>	<i>Andahuaylas</i>			<i>Mantaro</i>		
	<i>Made trip</i>	<i>Did not made trips</i>	<i>Total</i>	<i>Made trip</i>	<i>Did not made trips</i>	<i>Total</i>
Localist	49	73	68	36	48	44
Cosmopolitan	51	27	32	64	52	56
Total	20	80	318	29	71	443

As can be seen from Table 6 there exists a difference of 24% in Andahuaylas between the incidence of cosmopolitan orientation of those who went on outside trips and those who did not. Those who made outside trips show a higher incidence of cosmopolitanism. In the Mantaro region, however, the difference between the two groups in regard to cosmopolitan orientation is 12%. Mantaro *comuneros* who did not go on outside trips, however, show the same degree of cosmopolitanism as Andahuaylas *comuneros* who make outside visits. Apparently cosmopolitan orientation is so common in the Mantaro region that the effects of outside contacts are reduced, whereas in the Andahuaylas region they still exercise a strong influence.

F. *Social status and wealth.* The measurement of social status and wealth in rural areas in present-day underdeveloped countries poses serious problems for the researcher. The social status of an individual is his relative position within his social group. A person is ranked according to possession of those elements highly valued by the members of his social group. These elements can be material, non-material or both. It can be assumed that there exists a direct relationship between the possession of valued elements and the social rank an individual enjoys. Thus, once wealth can be measured, the corresponding social status can be inferred. The problem of the selection of elements to be used as measures of wealth and social status in rural areas is that group values are a mixture of traditional rural elements and present-day urban elements.

Comuneros are mainly independent farmers, that is they cultivate their own plots of land. There is a marked difference, however, in the importance of agricultural enterprise for them. As a result of integration of the rural sector into the national society, and probably due to the fact that the amount of available land is not sufficient to sustain his family, the *comunero* is obliged to look for additional sources of income. For the *comunero* group there exists a variety of commitments to agriculture. It can be the only source of income (monetary or not), the main source of income, or an additional source of income. In order to measure the commitment of the *comunero* to agriculture, an index was devised consisting of the number of economic activities in which the *comunero* was engaged and the importance of agriculture within these activities. The classification is as follows:

- *Primary agriculturalists* - those who are engaged only in agricultural activities.
- *Secondary agriculturalists* - those whose main occupation is agriculture but who, in addition, are engaged in other economic activities.

- *Tertiary agriculturalists* – those whose main occupation is non-agricultural, but who in addition cultivate some land which is available to them.

Only 1.2% of *comuneros* in Andahuaylas and 1.7% in Mantaro declared that they had no land. These were included in the third category because of their minor involvement in agricultural activities.

The involvement of *comuneros* in agriculture depends firstly on the sufficiency of the enterprise and secondly on the possibility of additional employment in other occupations. As Mantaro *comunidades* are located in an area in which there are more possibilities than in Andahuaylas, it could be expected that they will show a lower percentage of primary agriculturalists. The following distribution was obtained: 77% of Andahuaylas *comuneros* were primary agriculturalists, as compared to 46% in Mantaro. In the Andahuaylas region, 17% were secondary agriculturalists as compared to 30% in Mantaro. Finally, in Andahuaylas 2% were tertiary agriculturalists as compared to 20% in the Mantaro region. In Andahuaylas, 4% of the *comuneros* were engaged in non-agricultural enterprises, while in Mantaro 3%.

Among people engaged in agriculture the possession of land and animals is commonly used as an indicator of wealth.²³ Even in the case of a non-monetary economy, these two elements are considered measures of rural or traditional wealth. In a monetary or mixed economic system, however, they can be converted into monetary wealth. To measure traditional wealth the amount of land available to the *comunero*, as well as the number of cattle, sheep and horses he possesses, can be used.

As the rural areas of Peru are becoming more and more integrated into the national society, it was deemed necessary to consider indicators of monetary wealth as well. However, valid information concerning the amount of money earned by *comuneros* was extremely difficult to obtain, so the possession of a radio was chosen as an indicator of monetary wealth. In addition, education as an element of national society was considered because of the high value placed on it by *comuneros*. To complete the set of indicators helpful in the measurement of wealth, and thus social status, housing conditions were considered. In both rural and urban society a good house is considered a sign of wealth and status. In both regions studied an 'average' house consisted of two rooms with a thatched roof, whereas a good house had more than two rooms and a tiled or corrugated tin roof.²⁴

Three partial indices were distinguished which could be used to mea-

sure aspects of wealth. Traditional wealth is indexed by the possession of animals; monetary wealth by the possession of a radio, and wealth in general by the possession of a good house.

The correlations (Tau) between the indicators of traditional wealth i.e. sheep, cattle and horses were satisfactory, Tau ranging from .211 to .313 for Andahuaylas and from .163 to .186 for Mantaro. The following four-category index was devised:

- *Low*: The respondent does not own horses, sheep or cattle.
- *Medium low*: The respondent does not own a horse but has a minimum number of sheep (less than 10), and a minimum number of cattle (less than 6).
- *Medium high*: The respondent either owns a horse and has a minimum number of sheep or cattle, or he does not own a horse and has a great number of either sheep or cattle.
- *High*: The respondent has a horse and has a great number of sheep and cattle.

Table 7. Percentage distribution of wealth indices; Andahuaylas and Mantaro

<i>Traditional wealth</i>	<i>Andahuaylas</i>	<i>Mantaro</i>	<i>Land</i>	<i>Andahuaylas</i>	<i>Mantaro</i>
Low	16	23	No land	1	2
Medium-low	47	50	< 1 ha	79	64
Medium-high	20	20	1.1— 6 ha	18	32
High	17	7	> 6.1 ha	2	2
Total	318	443	Total	318	443

<i>Household wealth</i>	<i>Andahuaylas</i>	<i>Mantaro</i>	<i>Radio</i>	<i>Andahuaylas</i>	<i>Mantaro</i>
Low	66	10	Does not own	81	44
Medium	29	46	Own	19	56
High	5	44	Total	318	443
Total	318	443			

Table 7 shows that *comuneros* of the Andahuaylas region possess more animals than those of the Mantaro region and significant differences are evident between the number of respondents who do not own any animals and those who fall into the highest category.

Household wealth was measured by the number of rooms and the type of roofing for a given house. The Tau between these indicators for both the Andahuaylas and Mantaro regions was .149. Three categories were distinguished:

- *Low*: Less than three rooms without tiled or corrugated tin roofing.
- *Medium*: Either less than three rooms with tiled or corrugated tin roofing, or three or more rooms without tiled or corrugated tin roofing.
- *High*: Three or more rooms with tiled or corrugated tin roofing.

Table 7 demonstrated great differences between the two regions studied, due to the fact that use of tiled roofing is widespread in the Mantaro region, whereas tiled roofing and, lately, corrugated tin roofing were only recently considered manifestations of wealth in the Andahuaylas region. In spite of this, the index seems to be a valid indicator of the relative wealth of *comuneros* within each region.

Differences in the amount of land available to each *comunero* family are also evidenced in Table 7. Although small landholdings (less than 1 hectare) are common in both regions, Andahuaylas *comuneros* dispose of less land than those of Mantaro.

The possession of a radio is more widespread among Mantaro *comuneros*.

These distributions give a clear idea of the existing differences between the two regions. Only in the case of the possession of animals do Andahuaylas *comuneros* fare better than those of Mantaro.

Table 8. Correlations between social status and wealth indices for Andahuaylas and Mantaro

		<i>Mantaro</i>				
		<i>TWI</i>	<i>Radio</i>	<i>HWI</i>	<i>Education</i>	<i>Land</i>
<i>Andahuaylas</i>	<i>TWI</i>		.024	.027	.035	.324
	<i>Radio</i>	.114		.288	.149	.019
	<i>HWI</i>	.032	.226		.167	.059
	<i>Education</i>	.058	.294	.197		.083
	<i>Land</i>	.254	.102	.109	.217	

In order to verify the relationship between these indices and the level of education, and whether they could form an overall social status index, they were correlated and submitted to an elementary linkage cluster analysis.

Comparison between the two correlation matrices yields interesting conclusions. No correlation is shown between the 'traditional wealth' index (TWI), the 'household wealth' index (HWI) and the level of education for either region. Additionally, in the Mantaro region there is no correlation between possession of land and possession of a radio, the 'household wealth' index or the level of education. In the Andahuaylas region the possession of land is related to education, but is only weakly related to the 'modern wealth' index and the 'household wealth' index. A rather strong correlation exists, in both regions, between the 'traditional wealth' index and the possession of land. These results are in agreement with the recognition of two separate aspects or dimensions of wealth in the two regions studied. The results of the elementary linkage analysis for both regions turn out to be the same; one cluster is formed by the 'traditional wealth' index and the possession of land, while another is formed by the level of education, the possession of a radio and the 'household wealth' index. The 'traditional wealth' index and the possession of land have been considered favourable conditions. However, to assess the validity of this assumption they will also be used in the analysis as if they were initial factors. The results of this analysis will determine whether they are favourable conditions, or should be treated as initial factors.

Table 9. Percentage of those aware of innovations, correlation matrix of the three innovations considered; Andahuaylas and Mantaro

	<i>Mantaro</i>	<i>Knowledge</i>		
		<i>Improved seeds</i>	<i>Fertilisers</i>	<i>Pesticides</i>
<i>Andahuaylas</i>	%	86	88	87
<i>Improved seeds</i>	83		.543	.377
<i>Fertilisers</i>	79	.602		.661
<i>Pesticides</i>	72	.560	.853	

	<i>Knowledge</i>	
	<i>Andahuaylas</i>	<i>Mantaro</i>
Low	13	6
Medium-low	9	5
Medium-high	8	10
High	70	79
Total	318	443

Knowledge concerning the existence of available innovations was measured by an index which counted the number of innovations with which *comuneros* were familiar. Lack of knowledge was inferred from a question dealing with actual and past use of the innovation involved. When the respondent was not using or had not used an innovation the reason for non-use was elicited. Those *comuneros* who stated that they did not know about an innovation or could not answer the question 'Why not?' were considered as *non-knowers* regarding that innovation.

Table 9 shows that the degree of knowledge concerning available innovations was high in both regions. The index formed ranged from score 1 (no innovations known) to 4 (all innovations known). In the Andahuaylas region the level of knowledge is lower than in the Mantaro region; 13% of Andahuaylas *comuneros* do not know any innovations, as compared to 6% in Mantaro, however 70% of Andahuaylas *comuneros* know of all of the innovations as compared to 79% of Mantaro.

Willingness to accept innovations or, even more generally to accept change, is said to be dependent on socio-psychological orientations. Thus a higher propensity to accept innovations can be inferred from the presence or absence of certain socio-psychological characteristics. Rogers²⁵ and others have stated that these characteristics can be summarised into one overall attitude. *Comuneros* who have a modern outlook will be more willing to accept innovations than those with a traditional outlook. In order to verify the applicability of this postulate to the present research cases, partial indices will be constructed to measure:

- A. fatalism,
- B. faith in fellow *comuneros*,
- C. localism,
- D. familism,
- E. aspirations for children.

Using these five indices, an attempt will be made to form an overall index. If an overall index is not feasible, the individual indices will be analysed as individual factors related to propensity for the acceptance of innovations.

A. *Fatalism* has been described as an individual's belief that he cannot influence his own destiny and the resultant tendency to accept life as it comes. The three following statements were used to measure fatalism:

- a. Some people say that nothing can be done without God's help.
- b. Some people say that when one is born his (destiny in) life is already determined.
- c. Some people are born to lead, others are born to obey.

Table 10. Percentage distribution of fatalism, familism, faith in other comuneros, localism and aspirations for children; correlation matrix, Andahuaylas and Mantaro

		Mantaro				
		Fatalism	Familism	Faith in comuneros	Localism	Aspirations for children
Andahuaylas	%	45	49	41	44	68
Fatalism	46		.314	.073	.039	-.064
Familism	51	.228		.032	.115	-.095
Faith in comuneros	54	.016	-.012		-.062	-.108
Localism	68	.211	.080	.060		-.204
Aspirations for children	75	.113	.017	.048	.085	

In the Andahuaylas region the correlation between these items ranged from .115 to .236, while in Mantaro the range was from .130 to .400. An index was formed by counting the number of non-traditional answers. Scores ranged from 1 (non-fatalistic answers) to 4 (only non-fatalistic answers).

Distribution of the scores for the two regions do not show relevant differences. *Comuneros* of both regions are for the most part, fatalists. The analysis dichotomises the range, considering fatalist those with score 1, and activist those with scores 2, 3 and 4.

B. *Faith in fellow comuneros*. Instead of measuring faith in a 'generalised other', attention was focused on faith in other *comuneros*. Two items were used to assess this:

- a. If you have a problem, will the other *comuneros* help you?
- b. Would you help somebody you do not know well?

The correlation between the items was .142 for Andahuaylas and .320 for Mantaro. Scoring consisted in counting the number of 'yes' answers and forming an index ranging from 1 (no 'yes' answers), to 3 (both answers were 'yes'). The index was dichotomised into scores 1 and 2 (no faith), and score 3 (faith). Table 10 shows that *comuneros* from Andahuaylas tend to have more faith in their fellow *comuneros* than those from Mantaro.

C. *Localism* has been dealt with on p. 98.

D. *Familism* was measured by the following items:

- a. It is better to employ a member of the family than a stranger.
- b. It is better to work near one's parents, even though one can find better work somewhere else.

The correlation is .142 in Andahuaylas and .168 in Mantaro. Scoring consisted in counting the 'disagree' responses, forming an index ranging from 1 (no 'disagree' responses, or high familism) to 3 (all 'disagree' answers, representing low familism). Table 10 shows no difference between the degree of familism among *comuneros* of the two regions.

E. *Aspirations for children* were measured by combining the following two questions:

- a. How will the future situation of your children compare with your situation?
- b. Can you do anything to assure that the condition of your children will be better than yours?

Those who answered that the condition of their children will be better than their own, and said that they could do something to accomplish this, were considered to have aspirations for their children, whereas those with other answer patterns were considered not to have aspirations; 68% of Mantaro *comuneros* had aspirations for their children, as compared to 75% for those in Andahuaylas. The fact that Andahuaylas *comuneros* seem to have more aspirations than those of Mantaro can be explained by the fact that the situation in the Mantaro region is already satisfactory. Moreover, Mantaro *comuneros* have participated for a longer period in activities of the national society, whereas Andahuaylas *comuneros* have only recently had access to these benefits.

The distribution of the indices in the two regions shows no difference for the 'fatalism' index or the 'familism' index, whereas for the 'faith' index, the 'localism' index and the 'aspiration' index, differences are demonstrated. The 'localism' index shows that Mantaro *comuneros* are less localist than those of Andahuaylas, as was expected. Andahuaylas *comuneros*, however, show more faith in fellow *comuneros* and have more aspirations for their children. The fact that Andahuaylas *comuneros* have more faith in fellow *comuneros* illustrates the impact of the recent historical experiences of Andahuaylas *comuneros*.

As is demonstrated by the data presented, Mantaro *comuneros* are more integrated into national institutions. For this reason more striking

differences were expected with regard to modern attitudes on fatalism and familism. Apparently, however, the influence of modernising factors on attitudes is not as straightforward as is normally assumed by social scientists. In order to verify whether the indices form an overall measure of modern-traditional orientation, they were correlated and subjected to an elementary linkage analysis. As can be seen from Table 10, the correlations tend to be low, suggesting that the five indices do not form an overall index. The results of the linkage analysis confirm this. For Andahuaylas, three out of the five indices can be considered one cluster. This cluster is formed by the 'fatalism' index, the 'familism' index and the 'localism' index. For Mantaro, two clusters can be detected. The first is formed by the 'fatalism' and the 'familism' indices while the other is formed by the 'localism' and the 'aspiration' indices. This seems to indicate that at least two dimensions are measured by the five partial indices. To take these dimensions into account two separate indices were formed, one consisting of the 'aspiration' index and the other by combining the 'fatalism', 'familism', and 'localism' indices. The overall index was called the 'traditional-modernism' index and originally ranged from 1 (modern, no traditional answer on any of the partial indices) to 4 (only traditional answers on the partial indices). It is interesting to note that the main differences between the two regions lie in the extreme scores. Those in the Mantaro region have more score 1 and less score 4 than those in the Andahuaylas region whereas for scores 2 and 3 the differences are small.

In subsequent analysis, however, the overall index was dichotomised, denominating scores 1 and 2 as the modern category and scores 3 and 4 as the traditional category. For the 429 *comuneros* of the Mantaro region who are engaged in agriculture the distribution according to this 'traditional-modernism' index shows that 58% are modern and 42% traditional. For the 306 *comuneros* of the Andahuaylas region, the index shows that 45% are modern and 55% traditional.

Acceptance and adoption of innovations presented was measured by their past and present use. Analysis was limited to the use of improved seeds, fertilisers and pesticides in the cultivation of the main crop, potatoes. In the cultivation of other crops these modern agricultural elements were scarcely used. As previously stated, acceptance of an innovation means that it was used once, while adoption is measured by continued use.

As can be seen from Table 11, the degree of acceptance in the Andahuaylas region is very low; only 10% of the *comuneros* had ever used

Table 11. Percentages of innovation users; correlation matrix, Andahuaylas and Mantaro

	<i>Acceptance</i>				<i>Adoption</i>			
	<i>Mantaro</i>	<i>Improved seeds</i>	<i>Fertilisers</i>	<i>Pesticides</i>	<i>Improved seeds</i>	<i>Fertilisers</i>	<i>Pesticides</i>	
<i>Andahuaylas</i>	%	16	39	53	%	14	37	51
<i>Improved seeds</i>	2		.441	.267	2		.429	.257
<i>Fertilisers</i>	10	.283		.472	8	.315		.455
<i>Pesticides</i>	9	.295	.690		8	.312	.811	

Percentage distribution for the acceptance and adoption indices

	<i>Acceptance</i>		<i>Adoption</i>	
	<i>Andahuaylas</i>	<i>Mantaro</i>	<i>Andahuaylas</i>	<i>Mantaro</i>
Low	88	38	91	41
Medium-low	6	27	3	27
Medium-high	5	22	5	21
High	1	13	1	11
Total	318	443	318	443

the most widely known innovation – fertilisers – in his agricultural undertakings. In the Mantaro region, however, the acceptance of innovations is higher, but it must be mentioned that, before the PNDIPC started its activities, improved seeds, fertilisers and pesticides were already known and used in the region. According to the data gathered 5% of Mantaro *comuneros* used improved seeds, 11% used fertilisers and 18% used pesticides before, or during 1966. However, in Andahuaylas, less than 1% were using either improved seeds or pesticides, and 2% were using fertilisers before, or during 1966. This indicates that the PNDIPC did not introduce innovations into the Mantaro region but was engaged in fomenting their application, while in the Andahuaylas region it actually introduced them.

By combining the number of innovations used by *comuneros*, indices were constructed to measure their acceptance. As is to be expected the number of *comuneros* in Andahuaylas who used none of the innovations is large (91%) and only 1% is using all three. The situation in Mantaro is, of course, different. Given the fact that modern agricultural techniques cannot be considered innovations in the strict sense of the given definition, the interpretation of both the 'acceptance' and 'adoption' indices must be modified. For the Mantaro region then the indices show the adoption rather than acceptance, of modern agricultural techniques. For the Andahuaylas region however, the interpretation in terms of acceptance and adoption of innovations is still valid.

Comparing the distributions of the 'acceptance' and 'adoption' indices, the number of *comuneros* who discontinued the use of innovations accepted is quite small. For both regions the percentage of discontinued use is 3%, which makes an adequate analysis of motives for discontinuance impossible.

In order to analyse the factor land, several aspects must be considered:

- A. the amount of land available to a *comunero*;
- B. the system of tenure under which the land is held; and
- C. the fragmentation pattern of land held.

The amount of land at the disposal of each *comunero* and his nuclear family was measured by asking how much land was available to him and his family for exploitation. The amount was given in local measures and these were converted into hectares, with the collaboration of professionals in charge of local offices of SIPA or ONDC. There is a tendency to assume that *comuneros* will underreport the amount of land and/or animals in their possession as a means of protection against possible taxa-

Table 12. Percentage distribution of land fragmentation, tenure and sharing; Andahuaylas and Mantaro

Number of plots	Land fragmentation	
	Andahuaylas	Mantaro
No land	1	2
1	19	6
2 - 3	36	23
4 - 5	21	21
6 - 7	9	13
8 - 10	6	11
11+	6	15
No information	2	9
Total	318	443

	Tenure	
	Andahuaylas	Mantaro
No land	1	2
Property	90	82
Mixed	9	14
No information	0	2
Total	318	443

	Sharing	
	Andahuaylas	Mantaro
No land	1	2
Does not share	92	78
Shares	6	20
No information	1	0
Total	318	443

tion. The data obtained in this study, however, are consistent with data published in other studies²⁰ as the amount of land available to *comune-ros* and other small land-holders and thus seem to be reliable.

The amount of land available to *comuneros* in general is limited. The percentage distribution of land available to *comuneros* of the Mantaro region is as follows:

- 2% have no land at all;
- 64% have less than 1 hectare;

- 16% have between 1 and 2 hectares;
- 16% have between 2 and 6 hectares; and
- 2% have more than 6 hectares.

The percentage distribution of land available to *comuneros* of the Andahuaylas region is as follows:

- 1% have no land;
- 78% have less than 1 hectare;
- 12% have between 1 and 2 hectares;
- 6% have between 2 and 6 hectares; and
- 2% have more than 6 hectares.

Andahuaylas *comuneros*, then, tend to have less land available for exploitation than those of Mantaro. In addition to the total amount of land available to a *comunero*, the number of plots making up a total holding must be considered. Due to inheritance customs, which make persons beneficiaries through both maternal and paternal lineages, the land which a given *comunero* has available tends to consist of small plots in different parts of the *comunidad's* territory. *Comuneros* do not mind having land in different sections and at different altitudes in the community because it allows them to cultivate different crops; this is of special importance for subsistence farmers. In addition, this type of land holding is a kind of insurance against 'bad luck' in their undertakings. Pests, frost, and other calamities do not strike with the same intensity over the whole territory and thus the risk of losing all crops at once is less than if their holdings are continuous. On the other hand, this fragmentation tends to impede successful cultivation of market crops due to the fact that fragmented plots are so small that they make the use of modern agricultural techniques more difficult. It is to be expected, then, that the greater the fragmentation of holdings, the more limited the possibility of successful use of innovations. Land in the Mantaro region is more fragmented than that in Andahuaylas. In both regions there is a positive correlation between the amount of land available and the number of plots; Tau is .297 for Andahuaylas and .288 for Mantaro. Thus the more land available, the more plots will be held by each *comunero*.

Two aspects must be considered when looking at the land tenure system: the type of control that a *comunero* has over land available to him and the sharing pattern. There are three non-mutually exclusive types of control over land: it is private property, it is rented, or it is assigned to a *comunero* by the *comunidad*. In terms of the sharing pattern, a *comunero* may cultivate the land alone or he may share it with somebody else.

Sharing can take place when the land is owned jointly by the *comunero* and someone else (usually relatives or in-laws) or when a *comunero* is engaged in some other type of sharing operation. Sharing of this type takes place when the *comunero* does not have enough land to cultivate and somebody else cedes him land, and sometimes seeds, for cultivation purposes. The *comunero* who receives the land cultivates it, but shares the harvest with the person who ceded him the land. No distinction was made in this study between these two forms of sharing because it was expected that these arrangements would be rare in the regions studied. As can be seen from Table 12, 90% of the *comuneros* of the Andahuaylas region stated that the land was their property and only 9% held land in some combined arrangement. In the Mantaro region, 82% declared that the land was their property while 14% held it in mixed tenure.

As was expected, sharing was limited, especially in Andahuaylas where 92% of the respondents were not sharing and thus benefited exclusively from the harvests. In the Mantaro region, however, the results show that 78% of the respondents do not share, while 20% do. It is expected that those *comuneros* who benefit exclusively from the land they work will have a higher propensity to accept innovations. Thus, *comuneros* who own the land will have a higher rate of acceptance of innovations than those who do not; also *comuneros* who are not sharing will have a higher acceptance rate than those who do.

4.3. THE MODIFIED PROPOSAL

The results of the preliminary analysis suggest that modifications must be made to the original proposal.

The first modification is the reduction of the sample. As has been seen, not all *comuneros* are engaged in agricultural endeavours, and not all of those involved in agriculture are involved to the same degree. In the Andahuaylas region 4% of the *comuneros* are engaged in non-agricultural activities and in Mantaro 3%. Evidently these non-agriculturalists must be eliminated from the sample.

The second modification is related to the dependent variables (i.e. acceptance and adoption of innovations presented). It has been demonstrated that the difference between those who have discontinued the use of innovations in the two regions is small. Therefore, the part of the proposed analysis that would relate favourable experiences to the adoption of innovations becomes pretentious and will be dropped. Analysis will be restricted, then, to the adoption of innovations without taking the

intermediate stages of acceptance: favourable experiences, and adoption, into consideration.

The third modification consists in a differential treatment of innovations in the two zones. In the Mantaro region, as early as 1966, 5% of all *comuneros* were using improved seeds, 11% were using fertilisers and 18% were using pesticides. In the Andahuaylas region, however, preliminary results show that less than 1% of all *comuneros* used either improved seeds or pesticides and only 2% were using chemical fertilisers during 1966. In Mantaro, then, modern agricultural techniques cannot be considered innovations as they were already known and used in the region before the initiation of the PNDIPC. The 'adoption' index in this case measures only the frequency of use of modern agricultural techniques. In Andahuaylas, however, modern agricultural techniques presented by the state agencies involved can be considered innovations; consequently the 'adoption' index is representative of the actual adoption of innovations presented by the PNDIPC.

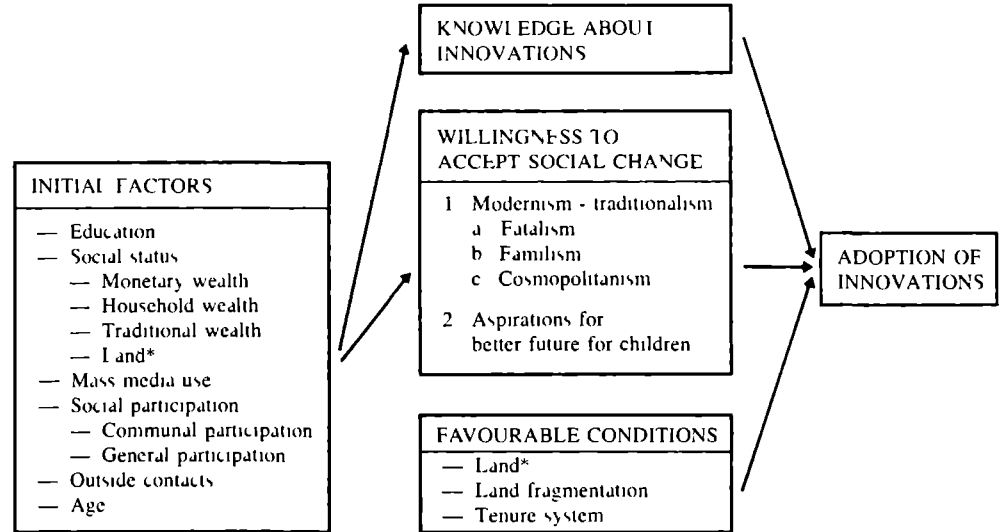
The fourth modification to be made is related to the tenure of land. As has been seen, the great majority of *comuneros* own their land. There are no *comuneros* who only rent and the mixed category is comprised of those who, in addition to owning land, have either rented or assigned lands at their disposal. The influence of the variable 'tenure' is negligible and will thus be excluded in future analysis.

In Chapter 5, analysis will be carried out taking these four modifications into account. To the original list of initial factors will be added the commitment to agriculture. Initial factors are expected to influence knowledge concerning innovations as well as willingness to accept and use them. Knowledge concerning modern techniques will be measured by the 'knowledge' index, whereas willingness to adopt and use them will be inferred from aspirations for children and from the 'traditional-modernism' index.

In addition to the initial factors, two favourable conditions will be considered: land fragmentation and sharing patterns. The amount of land held will be considered a favourable condition and not an initial factor. The amount of land will be used both as an initial factor and as a favourable condition until the results of analysis define its role more concretely.

Graphically the modified model is reduced to:

Figure 2. Schematic representation of the variables used in this study



* Will be used as indicator for social status or favourable conditions depending on the results of the preliminary analysis

1. Nuñez del Prado, O., 'Aspects of Andean Native Life', in: Heath, D.B., and Adams, R.N. (eds.), *Contemporary Cultures and Societies of Latin America*, New York, 1965, p. 115.
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5. Adoption of innovations – the analysis

This chapter consists of five parts. In the first part a description of some characteristics of the *comuneros* engaged in agriculture will be presented. The variables used to characterise the *comuneros* are those which were considered 'initial factors' in the model developed in Chapter 4. The objective of the characterisation is to describe some of the most salient elements of the actual situation of the *comuneros* of the two regions studied. For each region a description of the interrelationship of the initial factors will be given.

In the second part the relationship between the variables of the different blocks of the model will be analysed. Firstly the relationship between the initial factors and the socio-psychological orientations will be explored. The socio-psychological orientations considered in this study are a 'modernism' index and the 'aspiration for children' index. The willingness to use innovations will be deduced from these socio-psychological characteristics. Thus it is expected that *comuneros* who have high scores on the 'modernism' and 'aspiration' indices will be more willing to use the innovations. Secondly, the influence of the initial factors on the knowledge about, and adoption of, innovations will be explored. Finally, after these preliminary analyses an attempt will be made to assess the interrelationship between the different blocks of variables.

The third part of the chapter presents the relevance of the *comunidad*-level variables for the knowledge about and adoption of the innovations presented, i.e. the modern agricultural techniques.

In the fourth part an attempt will be made to integrate the results of the individual level analysis with that of the *comunidad* level analysis.

Finally, in the last part of the chapter an appraisal of the results of this study will be made.

5.1. THE PRELIMINARY ANALYSIS

5.1.1. *The characterisation of the comuneros involved in agricultural activities*

In Chapter 4 it was shown that in neither region were all *comuneros* interviewed engaged in agricultural activities. Furthermore it was shown that the degree of involvement in agricultural activities was not equal for all, and that the situation differed in the two regions studied. As was to be expected there was more differentiation in the Mantaro region than in the Andahuaylas region. The number of *comuneros* primarily engaged in agriculture in Mantaro was 46%, and in Andahuaylas 77%. The percentage of *comuneros* who had a primary non-agricultural occupation, but still carried out some agricultural activities, was 30% for Mantaro and 17% for Andahuaylas. Due to the small number of tertiary agriculturalists in the Andahuaylas region, they are lumped together with secondary agriculturalists, whereas in the Mantaro region all three previously distinguished types are considered separately in the analysis.

Table 1 shows that, with respect to age, there are no differences between primary and secondary agriculturalists, whereas *comuneros* who are tertiary agriculturalists are shown to be younger than those belonging to the other categories.

As to the level of education achieved by the three types, there exists a negative linear relationship between the degree of involvement in agriculture and the level of education obtained by a *comunero*. The smaller his involvement in agriculture the higher is his level of education.

With respect to monetary wealth, there exists a negative linear relationship between this index and involvement in agricultural activities. The smaller the *comunero's* involvement in agriculture, the higher is his monetary wealth.

There exists no clear relationship between involvement in agriculture and the possession of household wealth. There seems to be no major difference in the possession of a 'good house' between *comuneros* who are primary and secondary agriculturalists, although the latter group seems to possess the least household wealth. The tertiary agriculturalists enjoy this type of wealth most.

Between involvement in agriculture and traditional wealth there exists a curvi-linear relationship. The group that most possesses traditional wealth is the group of secondary agriculturalists, whereas the tertiary agriculturalists least enjoy this type of wealth.

Table 1. Relationship between agricultural status and the other initial factors, in percentages, for Mantaro (n = 429)

Variable	Category	Agricultural status			$p \chi^2$	Tau*
		Primary	Secondary	Tertiary		
Age	< 40 years	35	35	44	< .001	-.156
Education	Primary school	33	39	53	.01 < p < .02	-.143
Monetary wealth	Has radio	49	54	76	< .001	-.175
Household wealth	Rich	44	36	56	.01 < p < .02	—
Traditional wealth	Rich	26	42	10	< .001	—
Land	More than 1 ha	45	31	20	< .001	.199
Outside contact	Travelled	23	38	30	.001 < p < .01	.092
Mass media use	High	49	62	76	< .001	.215
General participation	External activities	17	20	14	> .05	—
Communal participation	High	80	90	60	< .001	-.102
Number of cases		203	135	91		

* Only values for Tau $\geq \sigma_{\text{Tau}}$ are presented; — means Tau < σ_{Tau} .
 $\sigma_{\text{Tau}} = 0.07$.

The way in which the three wealth indices are distributed among the types of agriculturalists sheds some light on the consequences of the different degree of involvement in agriculture. It seems that the tertiary agriculturalists are best off as they possess most monetary and household wealth. Tertiary agriculturalists do not dispose of large quantities of cattle and other animals. This is understandable as agricultural activities are only secondary for them, because they are already participating in the monetary sector of the economy.

There is no major difference between the primary and secondary agriculturalists with regard to the household wealth. It can be maintained however that the secondary agriculturalists will probably be better off than primary agriculturalists, because, unlike primary agriculturalists, they are able to acquire cash income through their secondary occupation. Additionally they own more animals than the other groups, thus having a further potential source of monetary income.

A positive linear relationship exists between involvement in agricultural activities and the amount of land one has available. The greater the involvement in agricultural undertakings, the more land a *comunero* has available.

The secondary agriculturalists had the highest incidence of outside contacts, but no difference is likely to exist when compared with tertiary agriculturalists. Comparing these two groups with the primary agriculturalists, the latter group seems to have the least outside contact.

With regard to the use of mass media there exists a negative linear relationship between the degree of use of mass media and involvement in agricultural activities. This relationship is not surprising, due to the fact that a similar relationship existed between involvement in agriculture and the variables 'education' and 'monetary wealth'.

There does not seem to exist any relevant difference in the degree of participation in what has been called 'general activities' relevant to the *comunero* population.

Although the three types of agriculturalists behave differently with regard to participation in communal activities, the relationship is not linear. The group which participates most in communal activities is that of the secondary agriculturalists, while the group that participates least is that of the tertiary agriculturalists. Primary agriculturalists are somewhat intermediate with regard to this type of participation. There is only a slight difference between the participation of primary and secondary agriculturalists, whereas these two differ considerably from the tertiary agriculturalists. These results indicate that the last group is apparently less involved than the other two in the ongoing activities of the *comuni-*

Table 2. Relationship between agricultural status and the other initial factors, in percentages, for Andahuaylas (n= 306)

Variable	Category	Agricultural status		p χ^2	Tau*
		Primary	Secondary		
Age	< 40 years	49	60	> .05	—
Education	Primary school	15	14	> .05	—
Monetary wealth	Has radio	18	22	> .05	—
Household wealth	Rich	5	3	> .05	—
Traditional wealth	Rich	41	25	.01 < p < .02	.133
Land	More than 1 ha	23	15	> .05	—
Outside contact	Travelled	20	23	> .05	—
Mass media use	High	19	25	> .05	—
General participation	External activities	10	5	> .05	—
Communal participation	High	66	79	> .05	.111
Number of cases		244	62		

dad. In the Mantaro region, then, the differential degree of involvement in agricultural activities is related to a series of other social characteristics. The three groups distinguished show differences with regard to their involvement in the monetary economy and the national society. They also seem to be related differently with the local community. Those whose main or sole occupation is agriculture are less involved in the on-going activities of the *comunidad* than those who are engaged in agriculture through their secondary occupation.

The *comunero* group then is by no means homogeneous. In Mantaro there are relevant differences between *comuneros*, and these differences are related to the degree to which they are involved in agricultural activities.

Table 2 shows that in Andahuaylas the overwhelming majority of *comuneros* are primary agriculturalists. Comparing these with the combined group of secondary and tertiary agriculturalists no differences are in evidence. Due to the skewness of the distribution of the occupational types it is extremely difficult to interpret the results satisfactorily. Primary agriculturalists are probably younger and dispose of more traditional wealth than the other types, whereas they seem to participate less in communal activities. These results suggest that the Andahuaylas region *comuneros* are a more homogeneous group; they are not involved in either the monetary economy or the national society. Their degree of participation in both of these sectors is low, and differences among the occupational types are not demonstrated.

These results were not unexpected, for the *comuneros* of the Mantaro region were much more developed and much more involved in the national society than those of the Andahuaylas region. The Andahuaylas *comuneros* can probably be considered subsistence farmers, and as such will show more peasant-like characteristics than Mantaro *comuneros*.

5.1.2. *The relationships between the initial factors*

The so-called initial factors which have been considered in this study are those variables which have been shown to be positively related with knowledge about, and use of, innovations.¹ They have been operationalised taking into consideration the conditions in the two regions studied. Even though all these variables are called initial factors with regard to the time dimension, some can be considered antecedent to others. Tentatively the variables education, age, monetary wealth, household wealth, traditional wealth, and possession of land, can be considered being

Table 3. Relationship between age and the other initial factors, in percentages, for Mantaro

Variable	Category	Age				$p \chi^2$	Tau*
		15-30	31-40	41-50	51-60		
Education	Primary school	62	38	42	23	< .001	-.183
Monetary wealth	Has radio	48	57	60	56	> .05	—
Household wealth	Rich	30	51	45	45	> .05	—
Traditional wealth	Rich	34	22	30	27	> .05	—
Land	More than 1 ha	27	36	32	39	> .05	—
Outside contact	Travelled	43	30	30	23	.02 < p < .05	-.115
Mass media use	High	67	60	60	55	> .05	—
General participation	External activities	25	26	16	10	.001 < p < .01	-.161
Communal participation	High	86	75	70	84	.01 < p < .02	—
Number of cases		61	99	117	152		

existent before outside contacts, mass media use, general social participation, and participation in communal activities. An attempt will be made here to obtain a more detailed scheme of the relationships existing between these variables.

In the case of the Mantaro region (see Table 3) age is related to the variables 'education', 'outside contact', 'general participation' and possibly also to 'participation in communal affairs'. The relationship between age and education is a negative linear one; young people have more education than older people. Less marked are the differences presented by the age groups with regard to outside contacts, younger *comuneros* having more outside contacts than older ones. As to the degree of participation in general activities, younger *comuneros* participate more than older ones. The relationship between age and communal activity participation is curvi-linear and somewhat weak. The youngest and oldest age groups participate more in communal activities than the middle groups. As the differences in participation among the different age groups are relatively small, not much importance can be attached to the U-shape of the relation between age and communal participation. One conclusion is fully justified, however, and that is that in Mantaro the young *comuneros* are still involved in the ongoing activities of their *comunidades*, in spite of outside contacts, and a high degree of participation in general activities. It is striking, however, that age has no relationship whatsoever with the wealth indices, nor with the amount of land that each *comunero* has available. This indicates that the structure of the Mantaro region is a stable one, and not the result of recent changes or events.

In the Andahuaylas region (see Table 4) age is related to education, monetary wealth, outside contacts, general participation, and participation in communal activities. It also appears that age is related to land available and mass media use. This indicates that, as was expected, age is of more importance in this region than in Mantaro, due to the fact that *comuneros* only obtained their independence from the overwhelming domination of the *hacendados* since the thirties. Younger people are better educated than older ones. Age is negatively related to monetary wealth as younger *comuneros* are richer than older ones. There seems to exist a weak positive linear relationship between age and the possession of arable land; older people possess more land than younger ones. There seems to be no difference among the three older age groups; they possess more land than the youngest age group. This result is in line with the recent development of the region. The older groups probably obtained lands after the breakdown of the domination of the *hacendado*

Table 4. Relationship between age and the other initial factors, in percentages, for Andahuaylas

Variable	Category	Age				$p \chi^2$	Tau*
		15-30	31-40	41-50	51-60		
Education	Primary school	28	17	8	4	< .001	-.346
Monetary wealth	Has radio	31	20	17	6	.001 < p < .01	.188
Household wealth	Rich	6	4	4	3	> .05	—
Traditional wealth	Rich	33	39	46	32	> .05	—
Land	More than 1 ha	12	23	24	25	> .05	.103
Outside contact	Travelled	33	20	18	10	.01 < p < .02	-.167
Mass media use	High	24	20	21	14	> .05	-.122
General participation	External activities	15	14	5	0	.001 < p < .01	-.185
Communal participation	High	61	81	66	65	.02 < p < .05	—
Number of cases		79	78	93	56		

group. The acquired land has been more or less equally distributed between them, whereas the younger group will have acquired land only through inheritance or purchase. Younger *comuneros* have more *outside contacts* than the older ones. There exists a weak negative linear relationship between mass media use and age. Young *comuneros* use the mass media slightly more than older ones. Younger *comuneros* have a higher degree of general participation than older ones.

A weak curvi-linear relationship exists between participation in communal activities and age. The A-shape curve seems to indicate that the youngest group is less involved in community affairs than the age group which was young when the breakdown of the region's traditional power structure took place. It must be remembered that the *comunidad* structure in this region has existed formally but was dominated by nearby *hacendados*. It is not surprising, then, that the older age groups participate less in communal activities than *comuneros* from 31 to 40 years of age.

The results of the analysis of relationships existing between age and the other initial factors clearly reflect the recent history of the region, and also demonstrate that, unlike the Mantaro region, Andahuaylas has no stable *comunidad* structure or tradition. Age, and hence personal experience during the transitional period, is an important factor for *comuneros* of this region. The youngest and the two older age groups are less involved with the *comunidad*, the youngest probably due to the influence of the national society, while for the oldest groups it is due to the inability to modify their behaviour with changing situations.

The variable 'education' in Mantaro (see Table 5) is related to monetary wealth, household wealth, mass media use, and participation in general activities. The relationship existing between the level of education and the level of monetary wealth demonstrates that *comuneros* who have no formal schooling or only a few years of formal schooling possess less monetary wealth than the group which has completed primary school.

The relationship between education and household wealth is basically the same as that between education and monetary wealth. The two groups having the lowest level of formal education possess less household wealth than the group with the highest level of education.

As was to be expected, there exists a positive linear relationship between education and mass media use. The group without formal schooling is handicapped in making full use of mass media. The difference between this group and the two groups with formal schooling is impressive; those who have completed primary education use the mass media most.

Table 5. Relationship between education and the other initial factors, in percentages, for Mantaro

Variable	Category	Education			p χ^2	Tau*
		None	Incomplete primary school	Complete primary school		
Monetary wealth	Has radio	50	49	67	< .001	.158
Household wealth	Rich	41	37	53	< .001	.152
Traditional wealth	Rich	16	29	30	> .05	—
Land	More than 1 ha	21	36	37	> .05	—
Outside contact	Travelled	31	29	29	> .05	—
Mass media use	High	0	60	76	< .001	.391
General participation	External activities	15	12	25	.001 < p < .01	.141
Communal participation	High	82	79	78	> .05	—
Number of cases		54	206	169		

With regard to the relationship between education and participation in general activities, it is a positive linear one without relevant differences between the two groups possessing a lower degree of education. Those *comuneros* belonging to the highest group participate most in general activities.

Education, an element of the national society, is not related to the three variables considered specific to the *comunero* sector of the Peruvian population – i.e. traditional wealth, possession of land, and participation in communal activities. These results suggest that national society characteristics do not influence *comunero* characteristics, thus indicating the relatively independent nature of *comunero* organisation.

In Andahuaylas the level of education (see Table 6) is related to all the other variables except participation in communal activities. Relationships then, exist between education and monetary wealth, household wealth, mass media use and participation in general activities. In addition, those characteristics previously considered to belong to the *comunero* sector are also related to education in this region. Although the relationship between education and *traditional* wealth is not strong, there is evidence that the group of *comuneros* who have completed at least primary school are better off than those who did not. More marked is the relationship between the level of education reached and the possession of land. In this case, those who have some schooling possess more land than those who do not, while those who have completed primary school education have still more land.

Even though the relationship between education and outside contacts is weak, there is evidence that education influenced outside contacts made by *comuneros* in 1972.

These results seem to indicate that unlike the situation in Mantaro, in Andahuaylas there is an interrelationship between the *comunero* social unit and the national society. In this region the possession of a national society cultural element, in this case education, has a positive influence on some of the characteristics of *comunero* organisation. In Andahuaylas, *comunero* organisation seems to be less independent of the national society than in the Mantaro region. The results obtained from analysis of the relationships between individual level characteristics are in accordance with the results of the *comunidad* level analysis. Thus one must conclude that even though Mantaro *comunidades* and *comuneros* are more integrated into the national society than those of Andahuaylas, they seem to be able to maintain their typical communal organisation free from interference from the national society. In Andahuaylas, however, the results indicate that, although there is less inte-

Table 6. Relationship between education and the other initial factors, in percentages, for Andahuaylas

Variable	Category	Education			$p \chi^2$	Tau*
		None	Incomplete primary school	Complete primary school		
Monetary wealth	Has radio	8	23	45	< .001	.292
Household wealth	Rich	2	5	11	.001 < p < .01	.180
Traditional wealth	Rich	34	37	55	.02 < p < .05	.116
Land	More than 1 ha	9	29	40	< .001	.283
Outside contact	Travelled	15	24	31	.02 < p < .05	.135
Mass media use	High	0	38	41	< .001	.493
General participation	External activities	3	11	22	< .001	.220
Communal participation	High	71	70	56	> .05	-.081
Number of cases		148	113	45		

gration into national society at both the *comunidad* and *comunero* level, there is more dependence on the national society than in the Mantaro region.

Table 7. Relationship between monetary wealth and the other initial factors, in percentages, for Mantaro

Variable	Category	Monetary wealth		$p \chi^2$	Tau*
		Has radio	Does not have radio		
Household wealth	Rich	58	27	< .001	.292
Traditional wealth	Rich	29	26	> .05	—
Land	More than 1 ha	37	32	> .05	—
Outside contact	Travelled	35	22	.001 < p < .01	.141
Mass media use	High	76	37	< .001	.414
General participation	External activities	19	15	> .05	—
Communal participation	High	75	84	.02 < p < .05	-.110
Number of cases		241	188		

* See note to Table 1.

In the Mantaro region the variable 'monetary wealth' (see Table 7) is related to household wealth, outside contact, mass media use and, to a lesser degree, to participation in communal activities. Those *comuneros* having monetary wealth possess more household wealth, have more outside contacts, and use the mass media more than those who do not. On the other hand they seem to participate less in communal activities. There are no relationships demonstrated between the variable 'monetary wealth', and traditional wealth, land, or participation in general activities. The fact that there is no relationship between monetary wealth and participation in general activities is somewhat surprising, due to the fact that possession of money enables *comuneros* to become engaged in the so-called general activities.

In Andahuaylas monetary wealth is related to all other variables, except the two participation indices (see Table 8). Household wealth in

Table 8. Relationship between monetary wealth and the other initial factors, in percentages, for Andahuaylas

Variable	Category	Monetary wealth		$p \chi^2$	Tau*
		Has radio	Does not have radio		
Household wealth	Rich**	8	4	< .001	.222
Traditional wealth	Rich	52	35	.01 < p < .02	.141
Land	More than 1 ha	31	19	.02 < p < .05	.115
Outside contact	Travelled	38	17	< .001	.207
Mass media use	High	44	15	< .001	.355
General participation	External activities	8	9	> .05	—
Communal participation	High	61	70	> .05	—
Number of cases		58	248		

* See note to Table 2.

** The difference in the *Poor* category is 28%.

this region, in contrast to the situation in the Mantaro region, demonstrates that those who do not have monetary wealth have poorer houses than those who do. Those *comuneros* who have monetary wealth are also better off on the 'traditional wealth' index. Although the relationship between monetary wealth and land is not strong, those having monetary wealth possess more land than those who do not. The relationship between the 'monetary wealth' index and the variables 'mass media use' and 'outside contacts' are the same as in the Mantaro region.

There is no relationship between the 'monetary wealth' index and participation in general activities in this region, and, as in the case of Mantaro, this result is surprising. There is a very weak indication that those who possess monetary wealth participate less in communal activities than those who do not. This result cannot be assessed properly due to the skewness of the distribution of the 'monetary wealth' index.

In the Mantaro region household wealth is related to mass media use, participation in general activities, and participation in communal activities (see Table 9). It also appears to be related to outside contact.

Table 9. Relationship between household wealth and the other initial factors, in percentages, for Mantaro

Variable	Category	Household wealth			$p \chi^2$	Tau*
		Rich	Middle	Poor		
Traditional wealth	Rich	26	28	36	> .05	—
Land	More than 1 ha	34	33	51	> .05	—
Outside contact	Travelled	36	21	39	.001 < p < .01	.087
Mass media use	High	68	56	35	< .001	.198
General participation	External activities	13	17	39	< .001	—,144
Communal participation	High	74	84	81	> .05	—,101
Number of cases		189	198	42		

* See note to Table 1.

The relationship between household wealth and outside contacts is curvi-linear, i.e. the rich and the poor, according to this index, have the same degree of outside contact, whereas those in the middle position have less contact than the two other groups.

The relationship between household wealth and mass media use is positive and linear, the richer the *comunero*, the greater his use of mass media.

There is a negative linear relationship between household wealth and the general participation. No difference seems to exist between the rich and middle groups on the 'household wealth' index with regard to the degree of participation, whereas the poor group participates more than the two other groups.

The relationship between household wealth and communal participation is weak, and no difference is evident between the poor and the middle groups, but the latter two groups seem to have a higher degree of participation than the rich group.

Household wealth is not related to traditional wealth and the possession of land.

Table 10 shows that in Andahuaylas household wealth is related only to outside contacts and participation in communal activities. Given the skewness of the distribution of the 'household wealth' index, it must be concluded that the rich and middle groups have more outside contact

Table 10. Relationship between household wealth and the other initial factors, in percentages, for Andahuaylas

Variable	Category	Household wealth			$p \chi^2$	Tau*
		Rich	Middle	Poor		
Traditional wealth	Rich	40	39	38	> .05	—
Land	More than 1 ha	31	27	17	> .05	.116
Outside contact	Travelled	50	24	18	.01 < p < .02	.123
Mass media use	High	19	24	18	> .05	.103
General participation	External activities	13	13	7	> .05	.103
Communal participation	High	12	62	75	< .001	— .217
Number of cases		13**	89	204		

* See note to Table 2.

** Base smaller than 20; percentages must be interpreted carefully.

than the poor group. With regard to participation in communal activities, the poor group participates more than the other two.

There is some evidence that household wealth is also related to the amount of land possessed by a *comunero*. The skewness of the distribution of this index does not permit a more precise assessment of the relationship.

In the Mantaro region traditional wealth is related to land, participation in general activities, and participation in communal activities (see Table 11). Those who are rich according to this index possess more land than those who are not. Richer *comuneros* participate more in general activities and in strictly communal activities than those who are not rich. There is no relationship between traditional wealth and outside contact, and mass media use.

The amount of land a *comunero* possesses seems to be positively related only to participation in general activities. *Comuneros* who possess more than 1 hectare of land participate more than those having less land.

In Andahuaylas traditional wealth is related only to the amount of land a *comunero* possesses (see Table 12). The richer *comuneros* according to this index, possess more land than poorer *comuneros*.

Table 11. Relationship between traditional wealth and land and the other initial factors, in percentages, for Mantaro

Variable	Category	Traditional wealth		$p \chi^2$	Tau*
		Poor	Rich		
Land	More than 1 ha	28	53	< .001	.240
Outside contact	Travelled	31	23	> .05	.081
Mass media use	High	57	64	> .05	—
General participation	External activities	13	29	< .001	.191
Communal participation	High	76	87	.001 < p < .01	.125
Number of cases		311	118		

Variable	Category	Land		$p \chi^2$	Tau*
		Up to 1 ha	More than 1 ha		
Outside contact	Travelled	30	27	> .05	—
Mass media use	High	58	61	> .05	—
General participation	External activities	14	24	.01 < p < .02	.119
Communal participation	High	77	83	> .05	—
Number of cases		277	149		

* See note to Table 1.

The amount of land a *comunero* has is positively related to the use of mass media and participation in general activities. *Comuneros* possessing more than 1 hectare of land seem to use mass media more, and to participate more in the general activities.

In order to measure adequately the wealth and social status of *comuneros*, the nature of the rural society has to be taken into account. Three different wealth indices were constructed to cope with the nature of the Peruvian situation. The 'monetary wealth' index was used to measure the monetary dimension of the wealth of *comuneros*. The 'household

Table 12. Relationship between traditional wealth and land and the other initial factors, in percentages, for Andahuaylas

<i>Variable</i>	<i>Category</i>	<i>Traditional wealth</i>		<i>p</i> χ^2	<i>Tau*</i>
		<i>Poor</i>	<i>Rich</i>		
Land	More than 1 ha	14	33	< .001	.225
Outside contact	Travelled	22	19	> .05	—
Mass media use	High	16	27	> .05	.086
General participation	External activities	8	11	> .05	—
Communal participation	High	68	70	> .05	—
Number of cases		189	117		

<i>Variable</i>	<i>Category</i>	<i>Land</i>		<i>p</i> χ^2	<i>Tau*</i>
		<i>Up to 1 ha</i>	<i>More than 1 ha</i>		
Outside contact	Travelled	21	22	> .05	—
Mass media use	High	14	43	< .001	.249
General participation	External activities	6	18	.001 < <i>p</i> < .01	.168
Communal participation	High	69	67	> .05	—
Number of cases		242	64		

* See note to Table 2.

wealth' index was considered because, in both the peasant sub-society and in the national society, a good or decent house is highly valued. The 'traditional wealth' index was constructed to account for the dimension said to be inherent in traditional rural Peruvian society. In addition, the amount of land possessed was considered even though, in contrast to other studies,² land is considered here as a favourable condition and not as a real initial factor; it is therefore not considered an indicator of wealth and social status. To allow for falsification of the role attributed to land, however, it was treated here as if it were an initial factor.

In Chapter 4 it has already been shown that, for the total population of both regions studied, these four indicators could not be combined into one overall wealth index, because an elementary linkage analysis resulted in two clusters in each of the regions. Land seemed to be more related to traditional wealth than to the two other wealth variables. Conversely, the 'monetary wealth' index was more related to the 'household wealth' index than to the two other variables considered. Thus the idea that there are at least two types of wealth structure in the Peruvian rural areas studied, seems justified. Therefore it is to be expected that the indicators forming these two different measures will be related in basically the same way to the other so-called initial factors. In this section of the present chapter the way the indicators behave will be reviewed. Of course the criteria used influence what relationship considered relevant. In order to present the results more objectively, rather strict and precise criteria* will be used initially.

In both Mantaro and Andahuaylas, the original 'monetary wealth' index is positively related both to the 'outside contact' index, and to the 'mass media use' index, when applying strict criteria. The 'household wealth' index is related to the 'mass media use' index only in Mantaro. The two are not related in Andahuaylas even when looser criteria are used. When applying the less strict criteria, the 'household wealth' index is related to the 'outside contact' index in both regions.

In neither region is the 'monetary wealth' index related to any of the participation indices, no matter what criteria are used. The 'household wealth' index is positively related to the 'general participation' index in the Mantaro region, while it is negatively related to participation in communal activities in the Andahuaylas region.

When applying the less strict criteria, the 'monetary wealth' index is related to both the 'traditional wealth' index and the 'land' index for Andahuaylas.

From this partial analysis it is clear that when applying strict criteria, the 'monetary wealth' index behaves the same way in both regions. When using looser criteria the only modification is that the index is related to the 'traditional wealth' and 'land' indices in the Andahuaylas region. These relationships illustrate once again the intermingling of the *comunero* structure with the national society structure in Andahuaylas.

The manner in which the 'household wealth' index is related to the other variables seems to confirm its hybrid character. In Mantaro, the region more integrated into national society, it relates to characteristics

* See the Methodological Note, in Appendix 2 for discussion about the criteria.

dependent on the national society. In Andahuaylas, however, it is negatively related to participation in communal activities when the strict criteria are used, and also to the 'outside contact' index when looser criteria are used. This suggests that in this less integrated region the characteristics are exclusively dependent on *comunidad* structure.

When applying the strict criteria, the 'traditional wealth' index is unrelated to any of the other variables in the Andahuaylas region, whereas in Mantaro it is related only to the 'general participation' index. When using looser criteria this index is also related to participation in communal activities.

The 'land' variable is related only to the 'mass media use' index and to the 'general participation' index in Andahuaylas, when using the strict criteria. In the Mantaro region land is related only to participation in general activities when using the less strict criteria.

The results of this partial analysis are less clear than those arrived at when analysing the indicators of the 'modern wealth' indices. Basically, the 'traditional wealth' indices seem to be most related to the 'general activities participation' index which is related to both *comunidad* and national society structure. None of these indices is related to the 'outside contact' index, or to the 'mass media use' index in the Mantaro region, but land is strongly related to the 'mass media use' index in the Andahuaylas region. These results seem to be consistent with the conclusion drawn previously concerning the nature of *comunero* organisation in the two regions. In the Mantaro region these two types of organisation or structures seem unrelated, whereas in Andahuaylas they seem to be intermingled.

Table 13. Relationship between outside contact and general participation and the other initial factors, in percentages, for Mantaro

Variable	Category	Outside contact		$p \chi^2$	Tau*
		Travelled	Did not travel		
Mass media use	High	66	56	$.02 < p < .05$	.107
General participation	External activities	18	17	$> .05$	—
Communal participation	High	77	79	$> .05$	—
Number of cases		125	302		

* See note to Table 1.

Table 13 (cont.)

Variable	Category	General participation		$p \chi^2$	Tau*
		External activities	No external activities		
Communal participation	High	83	78	> .05	—
Number of cases		75	354		

* See note to Table 1.

In the Mantaro region the 'outside contact' index is unrelated to mass media use, participation in general activities and participation in communal activities. Nor is there any relationship between the variables participation in general activities and participation in communal activities.

Table 14. Relationship between outside contact and general participation and the other initial factors, in percentages, for Andahuaylas

Variable	Category	Outside contact		$p \chi^2$	Tau*
		Travelled	Did not travel		
Mass media use	High	31	17	< .001	.238
General participation	External activities	10	8	> .05	—
Communal participation	High	47	74	< .001	— .241
Number of cases		64	242		

Variable	Category	General participation		$p \chi^2$	Tau*
		External activities	No external activities		
Communal participation	High	74	61	> .05	—
Number of cases		27	279		

* See note to Table 2.

In the Andahuaylas region the variable 'outside contact' is positively related to the 'mass media use' index, and negatively to the 'communal participation' index. The variables 'participation in general activities' and 'participation in communal activities' are unrelated.

Table 15. Relationship between mass media use and the other initial factors, in percentages, for Mantaro and Andahuaylas

Variable	Category	Mantaro Mass media use			$p \chi^2$	Tau*
		High	Medium	Low		
General participation	External activities	4	23	16	$.02 < p < .05$	—
Communal participation	High	80	79	76	$> .05$	—
Number of cases		252	140	35		

Variable	Category	Andahuaylas Mass media use			$p \chi^2$	Tau*
		High	Medium	Low		
General participation	External activities	17	11	3	$.001 < p < .01$	.173
Communal participation	High	58	68	74	$> .05$	— .110
Number of cases		62	113	131		

* See notes to Table 1 and Table 2.

In the Mantaro region there are weak relationships between the variables 'mass media use' and 'participation in communal activities', and the 'general participation' index. More precisely, those who make full use of the mass media, seem to participate less in the general activities available to *comuneros*.

In the Andahuaylas region, however, the 'mass media use' index is positively related to the 'general participation' index. Those who use the mass media more are more actively involved in the general activities available to *comuneros* than those who do not.

Participation in communal activities is weakly negatively related to participation in communal activities.

In order to facilitate the interpretation of the results obtained in this section, the relationship between variables considered will be presented graphically. A distinction was previously made between the variables considered to be initial factors. Age and education were considered as primary initial factors, and they are therefore independent variables which need no further explanation. The three wealth indices and land will be considered as secondary initial factors, due to the fact that they are dependent on the primary ones. The other variables belonging to this block will act as dependent variables. They will be separated into two sub-sets, according to their degree of reference to *comunidad* or to national society structure. Participation in communal activities is clearly a variable which belongs strictly to *comunidad* structure, whereas mass media use, outside contact and participation in general activities are variables closely related to national society structure. These two sub-sets of tertiary initial factors will have the same logical status, even though they refer to different aspects of the *comuneros'* social life.

The following sets of initial factors are considered:

- A. Primary initial factors: education and age.
- B. Secondary initial factors:
 - a. those referring to the traditional dimension; i.e. land and traditional wealth;
 - b. those referring to the national society dimension, i.e. household wealth and monetary wealth.
- C. Tertiary initial factors:
 - a. those referring to the *comunidad* structure; participation in communal activities;
 - b. those referring to the national society, i.e. participation in general activities, mass media use and outside contact.

In the graphical presentation the following convention will be used: within the sub-set relationships will be expressed by curved double-pointed arrows, while the relationships between variables of different sets will be expressed by single-headed straight arrows, indicating the supposed causal influence.³ In order to show the strength of the relationship between the variables, the value of Tau will be indicated above the straight arrows, or to the right of the curved arrows.

A pseudo-causal model will thus be constructed for the initial variables, and later on these will be used in relation to the explanation of the knowledge about and adoption of the innovations.

The figures represent the relations existing between the variables using the strict criteria. The difference between the two regions is clear. In the

Figure 1. Graphical representation of the relationships between the initial factors – Mantaro

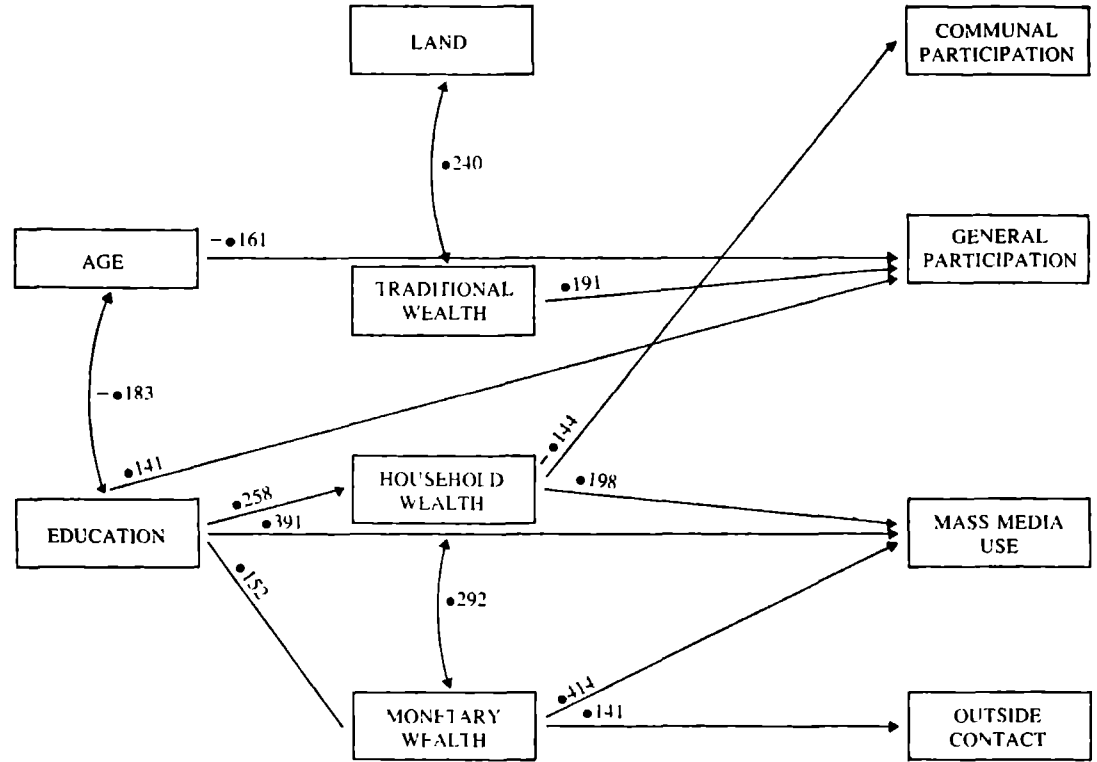
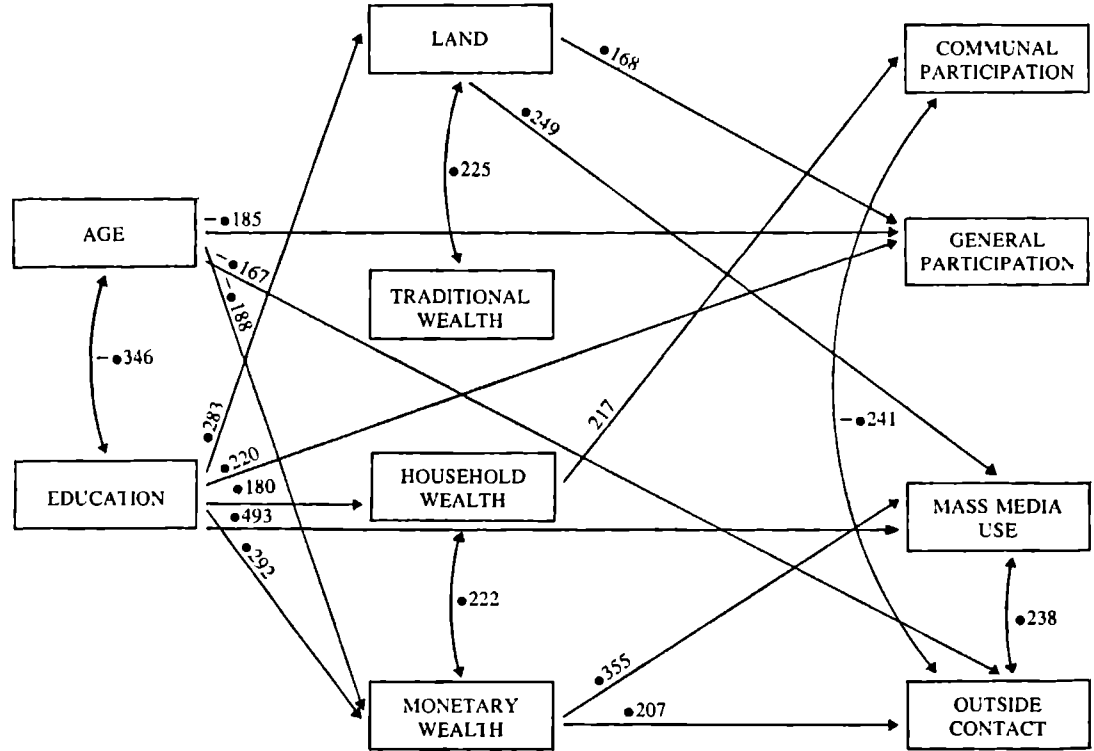


Figure 2. Graphical representation of the relationships between the initial factors – Andahuaylas



Mantaro region there is a definite separation between the *comunero* structure and the national society structure. This is demonstrated by the way the different blocks of variables behave.

The primary initial factor, education, is related only to the secondary initial variables referring to the national society dimension, i.e., household wealth and monetary wealth, and to the appropriate tertiary initial factors.

The secondary initial factors, referring to the traditional dimension, appear unrelated to participation in communal activities. They are also unrelated to the tertiary initial factors, with the exception of traditional wealth which is related to general participation. Thus, irrespective of the *comunero's* rank on the 'national society wealth' indices, if he scores high on the 'traditional wealth' index he is bound to be participating more in the general or modern activities and structures available to *comuneros*.

On the other hand household wealth, which has been considered an indicator of the national society dimension, is related to participation in communal activities. The higher a *comunero* scores on the 'household wealth' index, the less he will participate in communal activities.

The other primary initial factor, age, is related only to general participation and is therefore an unimportant variable in this region.

The case of Andahuaylas is completely different. In this region the *comunidad* and national society structures are intermingled. The primary initial factor, education, is not only related to secondary and tertiary initial factors referring to the national society dimension, but is also related to the land factor since this is an element of the traditional dimension of the *comunidad* structure. In addition it is related to two tertiary initial factors: general participation and mass media use. Additionally the tertiary initial factor referring to the national society dimension, outside contacts, is related to the tertiary initial factor referring to the *comunidad* structure, participation in communal activities.

Finally the other primary initial factor, age, is of more importance in the Andahuaylas region than in the Mantaro region. Here it is related to monetary wealth and outside contact in addition to general participation.

As was shown in Chapter 4, the Mantaro region is more integrated into the national society both at a *comunidad* and an individual level. In this region the *comunidad* and the national society structures are relatively independent. This means that participation in either structure appears to be unaffected by and unrelated to participation in the other structure.

In the Andahuaylas region both the *comunidades* and the *comuneros* are less integrated into the national society. Additionally, variables referring to the *comunidad* or traditional dimension are intermingled with those referring to the national society. This is partly a consequence of the recent history of the region – the transformation of a *hacienda* dominated structure to a *comunidad* structure.

5.2. APPLICATION OF THE MODEL

In this part of the chapter the relationship between the variables of the different blocks considered in the model (see Chapter 4) will be analysed to obtain a more refined model and to describe the processes that have led to the adoption of the modern techniques presented to the *comuneros* of the two regions. Willingness to accept innovations has been deduced from two socio-psychological orientations or attitudes: aspirations for a better future for one's children, and modernism. According to social science literature⁴ the initial factors have a positive influence on having a more open, and hence more modern orientation. On the other hand, these very same variables are mentioned⁵ as causal variables for the knowledge about and the acceptance and adoption of innovations.

In the following sections these relationships will be analysed in regard to both regions. However, it must be recalled that in order to cover the existing range of variations within the *comunero* population, some indicators were designed to refer explicitly to the Peruvian situation. They will be used together with the variables normally used in social science research.

5.2.1. *The relationships between the socio-psychological orientations and the initial factors*

In the Mantaro region the two socio-cultural or socio-psychological variables considered, aspirations for one's children and modernism, are correlated; the value of Tau_b for these two dichotomised variables is .196. According to the variables used 57% of the Mantaro *comuneros* are considered modern, while 68% have aspirations for a better future for their offspring.

Using strict criteria to evaluate the results obtained, only two variables are related to the index 'aspirations for one's children': *education* and the *use of mass media*. As will be recalled, in the first part of the

Table 16. The relationships between the initial factors and aspirations for one's children and modernism – Mantaro

Variable	Number of categories	Aspirations for one's children				Modernism			
		Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau
Age	4	A-shaped	*	$.02 < p < .05$	—	irregular	*	$p > .05$	—
Education	3	positive	.52	$p < .001$	.257	positive	.30	$p < .001$	.194
Monetary wealth	2	positive	.11	$.01 < p < .02$	.118	positive	.04	$p > .05$	—
Household wealth	3	positive	.17	$.01 < p < .02$	.138	positive	.19	$p > .05$	.104
Traditional wealth	2	positive	.06	$p > .05$	—	negative	-.02	$p > .05$	—
Land	2	positive	.08	$p > .05$	.084	positive	.02	$p > .05$	—
Outside contact	2	positive	.02	$p > .05$	—	positive	.02	$p > .05$	—
Mass media use	3	positive	.27	$p < .001$	.232	positive	.17	$.001 < p < .01$	.122
General participation	2	positive	.08	$p > .05$	—	negative	-.03	$p > .05$	—
Participation in communal activities	2	positive	.02	$p > .05$	—	negative	-.06	$p > .05$	—

* Due to the irregular relationship the value of 'd' is not presented.

— Tau < σ_{Tau} ; see note to Table 1.

chapter it was shown that these two initial factors were highly correlated and, in fact, showed the second highest correlation of all related initial factors. That these two factors are the most relevant for 'determining' the level of aspirations for one's children can be easily understood. Both education and mass media permit the *comunero* to obtain a broader outlook and allow him to be engaged in activities beyond the frontiers of his local community.

When using less strict criteria, the variables *monetary wealth* and *household wealth* also seem related to the aspiration index. The two variables both refer to what have been called the 'national society dimensions' of the *comunidad* organisation. Both are also highly correlated with the two variables that were related to the aspiration index when using the strict criteria. Thus these four variables all refer to the same dimension – the national society dimension – of the *comunidad* organisation and are the ones that are related to the aspiration index.

None of the typical *comunidad* organisation variables – traditional wealth, land, and participation in communal activities – appear to be related to this index.

With regard to modernism, only *education* is related to this index when applying strict criteria; when applying less strict criteria, *mass media use* also relates to it. Neither of the other variables – i.e. those from the national society structure, and those typical of the *comunidad* organisation – are relevant in regard to this index.

In the Mantaro region the variables related to the two indices used to indicate willingness to participate in social change processes are firstly *education*, and secondly the variables *mass media use*, *monetary wealth* and *household wealth*; all these variables refer to the national society structure. No *comunidad* organisation variables are related to these indices.

In the Andahuaylas region the two indices are only weakly related.

The value of the correlation index is only .108. According to the indices used 45% of the *comuneros* can be considered 'modern', whereas 75% have aspirations for their children. These results seem to indicate that the two indices do not refer to the same underlying variable. This lack of consistency can probably be attributed to the degree of development of the region, its recent history and the subsequent processes of social change which took place.

When applying strict criteria, the only variable related to the aspiration index is *education*, and when allowing for less strict criteria the variables *mass media use* and *monetary wealth* are also related to the aspiration index. The variable *mass media use* is related in a curvi-linear

Table 17. The relationships between the initial factors and aspirations for one's children and modernism – Andahuaylas

Variable	Number of categories	Aspirations for one's children				Modernism			
		Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau
Age	4	negative	-11	$p > .05$	—	negative	-30	$.001 < p < .01$	-.157
Education	3	positive	16	$.001 < p < .01$	.168	positive	25	$.01 < p < .02$	.141
Monetary wealth	2	positive	15	$.02 < p < .05$	.131	positive	12	$p > .05$	.086
Household wealth	3	A-shaped	*	$p > .05$	.100	positive	17	$p > .05$	.125
Traditional wealth	2	positive	6	$p > .05$	—	negative	-9	$p > .05$	—
Land	2	positive	7	$p > .05$	—	NO	0	$p > .05$	—
Outside contact	2	positive	4	$p > .05$	—	positive	17	$.02 < p < .05$	.143
Mass media use	3	U-shaped	*	$.01 < p < .02$	.101	A-shaped	*	$.02 < p < .05$	.108
General participation	2	negative	-9	$p > .05$	—	positive	27	$.001 < p < .01$	.153
Participation in communal activities	2	positive	4	$p > .05$	—	negative	8	$p > .05$	—

* Due to the irregular relationship the value of 'd' is not presented.

— Tau $< \sigma_{\text{Tau}}$; see note to Table 2.

way to the aspiration index; however, the difference between those who do not use mass media and those who only use them partially is slight, and can be discarded (72% versus 70%). Consequently, these two categories differ relevantly from those who use mass media fully.

No variable is related to the modernism index when applying strict criteria, although two variables (*age* and *participation in general activities*) seem to be related to this index. As was shown in the first part of the chapter, these two variables are related even though they do not refer to the same dimension of the *comunidad* organisation. The variable *age* is a reflection of the historic experience of the region and the general participation index reflects the penetration of the national society into the local hybrid *comunidad-hacienda* structure.

When using less strict criteria, the variables *education*, *outside contacts*, *household wealth* and *mass media use* are also related to the modernism index. None of the typical *comunidad* organisation variables are related to the modernism index, even though they are intermingled with the variables related to this index.

For both regions the two socio-psychological indices are only related to variables that refer to the national society structure. Thus for the region which is relatively developed and integrated into the national society, and where there is a relative independence between the *comunidad* structure and the national society structure, the typical *comunero* variables are not related to the two indices. The same is true for the region which is relatively undeveloped, which is not well integrated into the national society and due to its recent history, showed a mixture of the two structures. This leads to the conclusion that variables able to influence the socio-psychological variables are those that depend on the national society. In other words, variables that depend exclusively on the *comunidad* structure appear not to have a positive effect on variables which allow for willingness to accept social change in general, and more particularly the acceptance and adoption of innovation. This conclusion is understandable and plausible given that these two indices indirectly measure openness to new experiences and assume knowledge of the outside world, and hence the national society and its possibilities; it also demonstrates why the variables *education* and *mass media use* have a positive influence on these indices.

5.2.2. *The relationships between knowledge about innovations and the initial factors*

The initial factors are regarded as being positively related to the degree

Table 18. The relationships between the initial factors and knowledge about innovations, for Mantaro and Andahuaylas

Variable	Number of categories	Mantaro				Andahuaylas			
		Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau
Age	4	irregular	*	$p > .05$	.089	positive	9	$p > .05$	—
Education	3	positive	3	$p > .05$	—	U-shaped	*	$p > .05$	—
Monetary wealth	2	positive	3	$p > .05$	—	positive	6	$p > .05$	—
Household wealth	3	positive	11	$.02 < p < .05$	.113	A-shaped	*	$p > .05$	—
Traditional wealth	2	positive	1	$p > .05$	—	negative	-3	$p > .05$	—
Land	2	positive	1	$p > .05$	—	negative	-10	$p > .05$	.111
Outside contact	2	NO	0	$p > .05$	—	NO	0	$p > .05$	—
Mass media use	3	positive	17	$p < .001$	.125	positive	4	$p > .05$	—
General participation	2	positive	6	$p > .05$	.093	positive	6	$p > .05$	—
Participation in communal activities	2	NO	0	$p > .05$	—	negative	-9	$.02 < p < .05$	.115

* Due to the irregular relationship the value of 'd' is not presented.

— Tau $< \sigma_{\text{Tau}}$; see notes to Tables 1 and 2.

of knowledge individuals have about the innovations. This conclusion is based on a series of innovation studies and refers to the difference between 'early knowers' and 'later knowers'⁶ but it has been extended to the difference between knowers and non-knowers. Given that modern agricultural techniques can be considered innovations in the Andahuaylas region, where they were practically unknown before the PNDIPC started, this region was considered to throw some light on the variables responsible for the knowledge of the innovations presented.

Surprisingly, when applying strict criteria, in neither region are these variables related to knowledge of the innovations. In the Mantaro region *household wealth* and *mass media use* are related to knowledge only when using less strict criteria, whereas in the Andahuaylas region this only applies to *participation in communal activities*. In the Mantaro region the influence of the variables is positive, i.e. the higher the degree of household wealth or mass media use, the higher the knowledge. In the Andahuaylas region the influence is negative; thus those *comuneros* who participate more in communal activities have less knowledge of the innovations presented. In Mantaro the variables belong to the national society structure, while in Andahuaylas they are typically *comunidad* organisation variables.

Knowledge of modern agricultural techniques is widespread in both regions. In the Mantaro region 94% of the *comuneros* engaged in agriculture know at least one technique, while the figure for the Andahuaylas region is 87%. No explanation can be presented as to why so few initial factors are related to the knowledge index. It is especially surprising that no variables which widen the *comunero's* scope or world views are shown to be related to knowledge.

These negative results will lead to reconsideration of the role of the knowledge variable in the model proposed.

5.2.3. *The relationships between the adoption of innovations and the initial factors*

The degree of use of modern agricultural techniques in the two regions is quite different. In the Mantaro region no less than 61% of the *comuneros* engaged in agriculture use at least one of the three techniques, while in the Andahuaylas region the figure is 9%. As was shown in Chapter 4 this is due to the fact that, before the PNDIPC started in 1966, the *comuneros* of the Mantaro region were already familiar with these techniques. Thus for them the development programmes were only trying to extend the use of already known techniques, whereas in the Andahuaylas region the programmes were trying to introduce new techniques.

Table 19. The relationships between the initial factors and adoption of innovations, for Mantaro and Andahuaylas

Variable	Number of categories	Mantaro				Andahuaylas			
		Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau
Age	4	irregular	*	$p > .05$	—	positive	6	$p > .05$	—
Education	3	positive	26	$p < .001$	.182	positive	20	$p < .001$	.204
Monetary wealth	2	positive	17	$p < .001$	.169	positive	11	$.001 < p < .01$	.155
Household wealth	3	positive	36	$p < .001$	.145	positive	18	$p > .05$	—
Traditional wealth	2	positive	8	$p > .05$	.072	positive	6	$p > .05$	.104
Land	2	negative	-3	$p > .05$	—	positive	14	$p < .001$	.198
Outside contact	2	positive	8	$p > .05$	.079	positive	6	$p > .05$	.097
Mass media use	3	positive	40	$p < .001$	.184	positive	17	$p < .001$	.204
General participation	2	positive	8	$p > .05$	—	positive	16	$.001 < p < .01$	.156
Participation in communal activities	2	positive	15	$.001 < p < .01$	.125	negative	-6	$p > .05$	-.089

* Due to the irregular relationship the value of 'd' is not presented.

— Tau $< \sigma_{\text{Tau}}$; see notes to Tables 1 and 2.

huaylas region these techniques could be considered genuine innovations.

In the Mantaro region, when applying strict criteria, the variables related to the adoption of modern agricultural techniques are: *education*, *mass media use* and *monetary wealth*. When using less strict criteria, the variables *household wealth* and, surprisingly, *participation in communal activities* also appear to be related positively to the adoption of these techniques. With the exception of the *participation in communal activities* variable, all other variables related to the adoption index are those that belong to the national society structure and, according to the literature about innovations,⁷ they should be related to acceptance and adoption of innovations. What is surprising is that the variable *participation in communal activities* is also positively related to adoption. This means that the *comuneros* who participate most in communal activities are using modern agricultural techniques more than those who participate less. This can only be interpreted in the light of the situation in the Mantaro region where the *comunidad*, as a social unit, had real significance for its members and was also relatively well integrated in the national society. In relation to the fact that in this region the *comuneros* were using these agricultural techniques well before the PNDIPC started, this suggests that the internal integration of the *comunidad*, i.e. the integration of its members, has led to the diffusion of these techniques. Thus apparently the decision made in the past (i.e. before the PNDIPC started) to use these techniques was a 'collective decision' (see Chapter 2, 2.3.3.4) and due to the internal integration of the *comunidad* its use was generalised. Additionally, it must be recalled that even after the PNDIPC had started the *comunidad* as a social unit was important. In order to have the state organisations develop their activities in the *comunidad* it was necessary that an official petition be filed at the headquarters of the organisations by the *comunidad* authorities, and this petition had to be backed by the *comuneros*.

None of the variables which refer to the traditional dimension of wealth and social status of the *comuneros* is related to the adoption of modern techniques. Reference is made to the variables *traditional wealth* and *land*. On the other hand, the two variables which allow the *comuneros* to gain more knowledge of the outside world and its possibilities, *outside contacts* and *general participation*, are also unrelated to adoption. As knowledge of modern techniques is widespread in the region, and as their use is well under way, these variables, which allow for more outside contact and knowledge, apparently do not contribute to further incentives to use 'new' techniques. This is completely different

in the case of *mass media use*, which has a strong influence on the use of modern techniques. Apparently this latter variable enables the *comuneros* to obtain more relevant information on the use of the modern agricultural techniques.

In Andahuaylas, when applying strict criteria, the following variables are related to the adoption of the use of modern techniques: *education*, *mass media use*, *land*, *monetary wealth* and *general participation*. The remainder of the variables are unrelated to adoption, even when using less strict criteria. As in the Mantaro region the variables education, mass media use and monetary wealth have a positive influence on the use of the modern techniques. However, in this region *land* is also positively related to the use of the modern agricultural techniques; *comuneros* who have more land use these techniques more than those who possess less land. This differential behaviour of the *land* variable can be attributed to the nature of the rural sector of Andahuaylas. In that region the *comunidad* structure was less crystallised than in the Mantaro region and it only relatively recently came into existence under very special circumstances. As previously shown (p. 143), in this region there is intermingling of the typical *comunidad* characteristics with those that can be said to be national society characteristics. Additionally, as the use of these modern agricultural techniques is not widespread in the region, the *land* factor, i.e. the availability of sufficient land, seems to be important to the first users of these innovations. This suggests that in this region the introduction-diffusion of these innovations is still probably in its 'trial' stage, or, as described by Rogers and his associates,⁸ the 'decision function of the innovation-decision process'. Consequently, the *comuneros* actually using these modern agricultural techniques in this region can be called innovators or first adopters.

It is not surprising that the variable *general participation* is positively related to the use of innovations. This implies that the *comuneros* of Andahuaylas have more direct and precise information about the actual possibilities regarding the use of the innovations.

It thus turns out that *land* has a differential influence on the adoption of innovations. In the Mantaro region, where the use of these techniques is relatively general and where they were in use long before the PNDIPC started, the amount of land the *comunero* has does not seem to influence the use of modern techniques. However, in the region where they were only recently introduced, and where they can be considered genuine innovations, the amount of land is of importance. In Chapter 4 two approaches to *land* were presented. The first considered land an initial factor – i.e. an indicator of social status and wealth in the rural areas –

while the second (the one favoured in this study) was that land is only a favourable condition – that is, it does not exercise direct influence on the acceptance or use of modern techniques or innovations. The results of the present analysis suggest that a distinction must be made between the initial and later stages of the introduction-diffusion process of innovations. Apparently in the first stages – the most critical – the amount of land available seems to be of direct relevance to the acceptance of innovations, probably because of the possibilities it presents for experimentation on a limited scale with the innovations. In the later stages, when there is no uncertainty about the usefulness of the innovations, given the success of peers, *land* seems to lose its importance.

Two more variables were considered favourable conditions in connection with the amount the *comunero* has available. These were the fragmentation of the land: the more fragmented the land is, the smaller the likelihood of adopting innovations; and whether the *comunero* was ‘sharing’ the land or whether he alone would profit from his labour. It was expected that, if the land was shared, the propensity for using innovations would be less than if the land was not shared.

In both regions it was found that the only variable related to the amount of land was the *number of plots*. The more land the *comunero* had available, the more plots he had and vice versa. In the Mantaro region the correlation (Tau_b) between these two variables was .329 while in the Andahuaylas region it was .323. When using these two variables together in relation to the adoption of the innovations, it was found that they are both unrelated to the adoption index in the Mantaro region. This indicates that neither independently nor combined do these variables bear any relationship to the adoption of modern agricultural techniques. In the Andahuaylas region, although the variable *number of plots* was unrelated to the adoption index, when combined with the amount of land it was found to be relevant; especially in the categories of *comuneros* who possessed more than 1 ha of land. Of those owning up to five pieces of land 28% were using the innovations, whereas only 8% of those owning more than six pieces of land were using the innovations. Whereas, of those with less than 1 ha of land and more than six pieces of land only 7% were using at least one innovation. This gives an idea of the interaction effect of these two variables, which is no less than 21.⁹

In the Andahuaylas region *land* is an initial factor relevant to the adoption of innovations. Additionally, the number of plots of land is shown to be a favourable condition for the adoption of the innovations for *comuneros* who possess more than 1 ha of land. The *comuneros* with

'much' land that is relatively undivided tend to use the innovations. Sharing of land is of no relevance to the adoption of innovations.

It can be concluded that in the Mantaro region land is not an initial factor, and also that fragmentation of land and sharing are not relevant to the adoption of the innovations. It remains to be seen whether land is a favourable condition or not, when used in relation to the other initial factors.

Thus those variables directly related to the adoption of innovations are thought to be more effective in the cases where the *comuneros* have sufficient land available. In this study it was expected that those with more than 1 ha of land would use the innovations more than those with less than 1 ha of land when the variable which induces their use is available.

The initial factors which were directly related to adoption of innovations were: *education, monetary wealth, household wealth, mass media use and participation in communal activities*. If land is a favourable condition the sub-groups characterised by 'much' land, and the category of initial factors that has a positive influence on the adoption of innovations, should have the highest percentage of users. It is clear from Table 20 that this is not the case and that, on the contrary, the sub-groups that are characterised by 'less' land and the category of initial factors that has a positive influence on the adoption of innovations, tend to have the highest percentage of users. This leads to the conclusion that, in this region, land is not a favourable condition.

In this region where the use of the modern agricultural techniques is well under way, the role which the amount of land plays is not as crucial as is generally assumed. This is probably due to the fact that these techniques are widely available and employed in this region with a more or less assured market, relatively free of extraneous interference.

5.2.4. *The relationships between the initial factors, attitudes, knowledge of innovations and adoption of innovations*

In the model proposed in Chapter 4 the blocks of variables were inter-related. The initial factors were responsible for willingness to accept social change, and had positive relationships with knowledge of innovations and their adoption. It could be expected that the willingness block would be related to both knowledge and adoption variables.

In the Mantaro region it was found that the two indices which measured the willingness to be engaged in change processes were not related to knowledge whereas in the Andahuaylas region when applying less

Table 20A. Detailed information about the relationships between the initial factors and adoption of innovations, controlled by the amount of land available – Mantaro

Variable	Original relation				Land up to 1 ha				More than 1 ha			
	Type of relation	Value of 'd'	Relevant	Non-relevant	Type of relation	Value of 'd'	Relevant	Non-relevant	Type of relation	Value of 'd'	Relevant	Non-relevant
Age	irregular	*	*	*	irregular	*	*	*	irregular	*	*	*
Education	positive	26	71	45	positive	24	72	48	positive	34	67	33
Monetary wealth	positive	17	68	51	positive	13	68	55	positive	22	67	45
Household wealth	positive	36	66	30	positive	23	64	41	positive	52	67	15
Traditional wealth	positive	8	66	58	positive	11	71	60	positive	4	60	56
Outside contact	positive	8	66	58	positive	7	66	60	positive	6	62	56
Mass media use	positive	50	66	16	positive	53	67	14	positive	35	66	31
General participation	positive	8	67	59	positive	23	82	59	negative	-10	50	60
Participation in communal activities	positive	15	63	48	positive	11	64	53	positive	9	59	50

* Due to the irregular relationship these values are not presented

Table 20B. The relationships between the initial factors and adoption of innovations, controlled by the amount of land available – Mantaro

Variable	Original relation				Land up to 1 ha				More than 1 ha			
	Type of relation	Value of 'd'	$p \chi^2$	Tau	Type of relation	Value of 'd'	$p \chi^2$	Tau	Type of relation	Value of 'd'	$p \chi^2$	Tau
Age	irregular	*	$p > .05$	—	irregular	*	$p > .05$	—	irregular	*	$p < .001$	.154
Education	positive	26	$p < .001$	.182	positive	24	$.01 < p < .02$	.169	positive	34	$p > .05$	.184
Monetary wealth	positive	17	$p < .001$	.169	positive	13	$.02 < p < .05$	.134	positive	22	$.01 < p < .02$	.213
Household wealth	positive	36	$p < .001$	.145	positive	23	$p > .05$	.072	positive	52	$p < .001$	.242
Traditional wealth	positive	8	$p > .05$	.072	positive	11	$p > .05$	.092	positive	4	$p > .05$	—
Outside contact	positive	9	$p > .05$	.079	positive	7	$p > .05$	—	positive	6	$p > .05$	—
Mass media use	positive	50	$p < .001$	.184	positive	53	$p < .001$	.175	positive	35	$.01 < p < .02$	.219
General participation	positive	8	$p > .05$	—	positive	23	$.001 < p < .01$	.171	negative	—10	$p > .05$	—086
Participation in communal activities	positive	15	$.001 < p < .01$	.125	positive	11	$p > .05$	.095	positive	9	$p > .05$	—

* Due to the irregular relationship the value of 'd' is not presented.

strict criteria only the modernism index was weakly related to knowledge. However, this relationship was negative; the less modern orientated *comuneros* have more knowledge about innovations. This abnormal relationship cannot be interpreted using the knowledge obtained in the vast number of studies on the introduction-diffusion of innovations.

In the Mantaro region it was found that aspirations for one's children are only related to adoption when less strict criteria are used, while modernism is strongly related to adoption. In the Andahuaylas region, however, none of these indices is related to adoption of innovations.

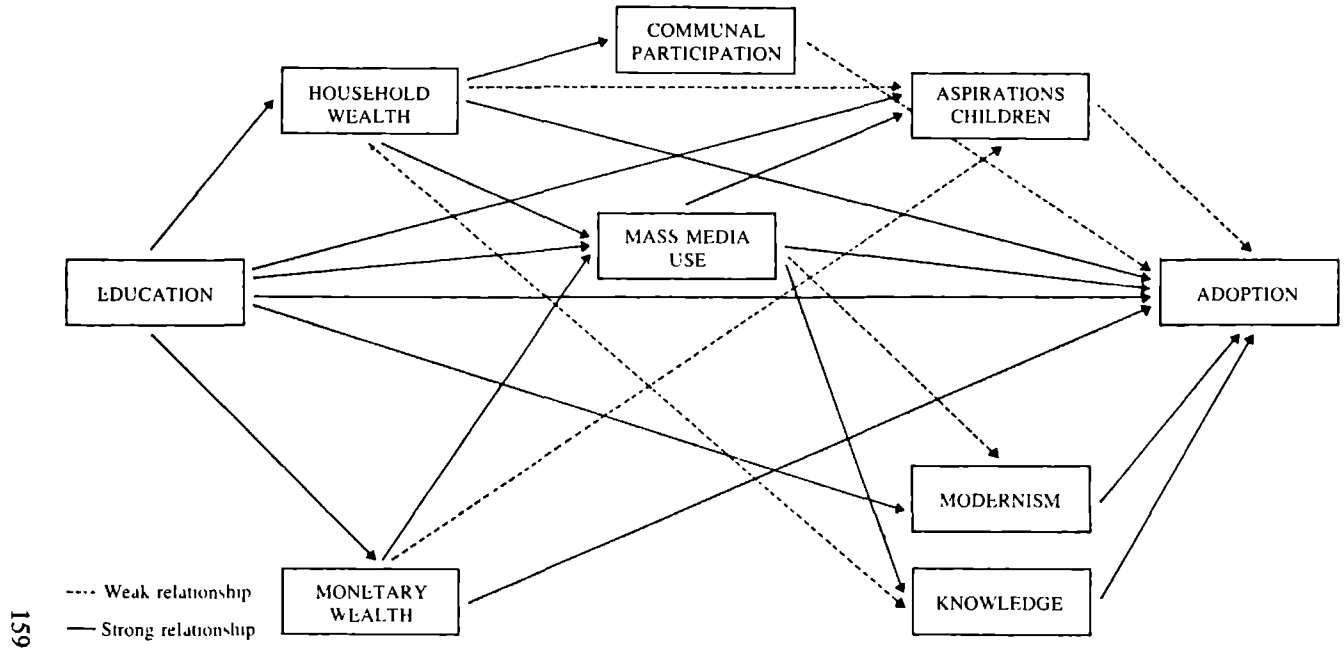
In the Mantaro region the influence of knowledge on adoption is, of course, very strong. The p -value corresponding to the χ^2 obtained is much less than .001, and the corresponding Tau is .271. In the Andahuaylas region this relationship is only weak, the corresponding p -value of the χ^2 being less than 2% but larger than 1%, while the Tau is .125. This weak association in the Andahuaylas region is probably due to the skewness of the distribution of the adoption index. As will be recalled, only 9% of the *comuneros* of the region were using one or more of the innovations considered.

For each region the relationship between the variables of the different blocks can be presented. It must be remembered that, up to now, only the individual level variables have been considered; the *comunidad* level variables have not yet been used. The two regions are, as previously shown, quite different in regard to the availability of agricultural innovations considered by the state agencies involved in the FNDIPC. The Mantaro region was most familiar with modern agricultural techniques and the *comuneros* of this region possessed characteristics which enabled them to adopt and accept the innovations. The *comunidades* of the Mantaro region and the *comuneros* can therefore be considered being more integrated into the national society and in that sense this region can be called modern, whereas the Andahuaylas region can be termed non-modern or transitional. The term 'transitional' is preferred to 'traditional' because, although the influence of modern technology and institutions is slight, this region and its inhabitants are involved in the national society. Due to the difference in the degree of integration into the national society the processes that took place in the two regions are different.

In the Andahuaylas region the process of trying to modernise the agriculture of the *comuneros* can genuinely be described as an introduction-diffusion process, while in the Mantaro region the process studied is simply that of the use of modern agricultural techniques.

In the Mantaro region the individual characteristics related to the use

Figure 3. The interrelationships between the initial factors, attitudes, knowledge and adoption of innovations – Mantaro



of these techniques are relatively few, and all but one can be said to belong to the national society structure of Peru.

- *Education* is related directly to *monetary wealth*, *household wealth*, *mass media use*, *aspirations for one's children*, *modernism* and to *adoption of the modern agricultural techniques*.
- *Monetary wealth* is related to *household wealth* – both are considered indicators of the modern social status structure of the society – and to *mass media use*, *aspirations for one's children* and *adoption of modern agricultural techniques*.
- *Household wealth* is related to *mass media use*, *aspirations for one's children*, *knowledge about innovations* and *adoption of modern techniques*. Additionally, this index is *negatively* related to *participation in communal activities*.
- *Mass media use* relates to *aspirations for one's children*, *modernism*, *knowledge about innovations* and to *adoption of innovations*.
- *Aspirations for one's children* is related to *modernism* – both are indicators for willingness to be engaged in social change processes – and to *adoption of modern techniques*.
- *Modernism* is related to *adoption of innovations*.
- *Knowledge* naturally relates to *adoption of innovations*; and lastly,
- *Participation in communal activities* is positively related to *adoption of innovations*.

As shown previously, land is not even a favourable condition in the Mantaro region. On the contrary, the analysis suggests that having 'much' land may have a negative influence on the use of modern techniques. As the sample is relatively small, and the observed differences are also relatively small, this matter will not be pursued further. However, the influence of land on the adoption of innovations needs more careful attention. The question is whether this finding is unique – due to the special conditions in the Mantaro region – or if it is a general conclusion valid for regions where there is relatively widespread use of modern techniques, a population that is only partly dependent on agriculture (due to the availability of other occupations) and relatively integrated into the national society.

Figure 3 shows which variables are either directly or indirectly related to adoption of modern techniques. The variables considered form a closed system, that is there are no dead ends. In order to gain some insight into how well these individual level variables explain or predict the adoption of innovations, a slightly different analysis was performed. Since the sub-group analysis does not permit simultaneous introduction

Table 21. Information about the variables directly related to adoption of innovations – Mantaro

	Zero order correlation	Standardised regression coefficients	Partial correlations	Cumulative proportion of variance explained
Knowledge	.806	.613	.567	.649
Aspirations for one's children	.652	.144	.168	.672
Communal participation	.096	-.107*	-.180	.681
Modernism	.588	.105	.134	.687
Monetary wealth	.552	.087	.110	.691
Household wealth	.598	-.069	-.93	.694
Education	.426	.051	.078	.696
Mass media use	.598	.030	.037	.697

* Negative value because the category 'Does not participate' was considered relevant.

of many variables with small samples, parametric regression technique was used, utilising the variables in dichotomised form.

It can be seen from Table 21 that, when all variables are related simultaneously to the adoption of innovations, these eight variables explain 69.7% of the variance of the adoption variable. From the standardised regression coefficients – the beta coefficients – the relative importance of these variables can be deduced. The most important variable was knowledge about innovations: this, of course, is no surprise. What is somewhat surprising is the low position of the variables *mass media use*, *education* and *household wealth*. The *t*-values associated with these beta coefficients refer to a significance level greater than 5%. The present sample is complex, and its mean \sqrt{Deff} value is larger than 1.0. These values therefore, over-estimate the real *t*-values. Consequently, no error is made if the latter variables are disregarded. If only the direct influence of the variables is considered, the conclusion would be that, by disregarding the variables with the three lowest positions, no serious consequences would result as the remaining variables still explain 69.1% of the variance. However, considering the system of the related variables, they cannot be disregarded as they contribute indirectly to the explanation of the variance in adoption of innovations. The conclusion which can be drawn is, of course, that the direct influence of these three variables – mass media use, education and household wealth – on the adoption of innovations is slight but in combination with the other varia-

bles they are important because they explain a considerable amount of the variance of the other intermediate variables. The variables 'household wealth' and 'mass media use' account for 50.0% of the variance of the variable 'knowledge'. The variables 'education' and 'mass media use' account for 28.7% of the variance of the variable 'modernism'. The variables 'monetary wealth', 'mass media use', 'education' and 'household wealth' account for 46.4% of the variance of the variable 'aspirations for one's children'.

It can be concluded that the related variables, according to the first analysis, explain a considerable amount of the variance of the dependent and the intermediate variables. The results of the first analysis, corroborated by the second, prove that the isolated variables can be considered the most relevant.

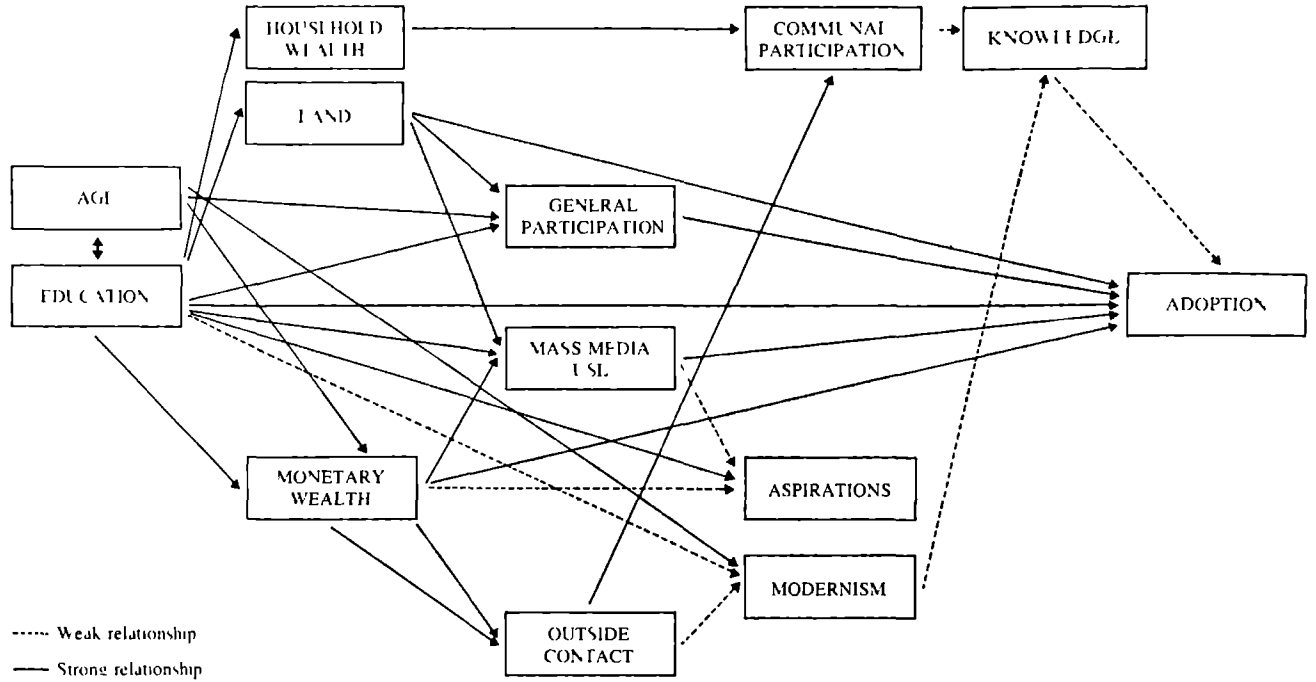
In this region all variables but one – participation in communal activities – are related to the national society. Hence, the more integrated the *comunero* is into the national society, the higher the likelihood that he will use modern agricultural techniques. The variables considered typical for the *comunidad* structure play no part in explaining the use of modern agricultural techniques.

As stated previously, the situation in the Andahuaylas region is entirely different. In this transitional region the PNDIPC has caused a genuine process of introduction-diffusion of innovations. It was previously mentioned that in this region the characteristics of the national society structure are intermingled with those that belong typically to the *comunidad* organisation. This is evident when one considers the graphical representation of the interrelationships of the variables which belong to the different blocks (Figure 4).

As can be seen, the variables related to the adoption of innovations show a much more complex situation than in the Mantaro region. This is due to the fact that the two structures present in the *comunero* sector are intermingled.

- *Education* is related to *age, monetary wealth, household wealth, land, general participation, mass media use, aspirations for one's children, modernism* and to *adoption of innovations*.
- *Age* is related to *general participation, outside contacts* and *modernism*.
- *Land* is related to *general participation, mass media use* and *adoption of innovations*.
- *Household wealth* is related to *monetary wealth* – both are indicators of the modern status structure – and to *participation in communal activities*.

Relationships between the initial factors, attitudes, knowledge and adoption of innovations – Andahuaylas



- *Monetary wealth* is related to *mass media use*, *outside contact* and *aspirations for one's children*.
- *General participation* is related to *modernism* and *adoption of innovations*.
- *Mass media use* is related to *outside contact* and *adoption of innovations*.
- *Outside contact* is related to *modernism*.
- *Participation in communal activities* is related to *knowledge of the innovations*.
- *Modernism* is negatively related to *knowledge about innovations*, while *knowledge* is only weakly related to *adoption of innovation*.

Thus no less than twelve variables have to be considered in relation with the adoption of innovations in this region. However, only six are directly related. These six independent variables can only account for 9.5% of variance of the dependent variable. This is probably due to the skewness of the distribution - only 9% of the *comuneros* in this region are using modern agricultural techniques. It might also be attributed to the fact that some of the indirectly related variables are important but were not detected in the previous (sub-group comparison) analysis. To verify this, the indirectly related variables were used as independent variables in another multiple regression analysis and it was found that they could account for an additional 2.6% of the variance of the adoption variable. However, the values of the standardised partial regression coefficient and the associated *t*-values suggest that the variance explained by them cannot be considered statistically significant; all the *t*-values were less than 1.96. Given the complexity of

Table 22. Information about the variables directly related to adoption of innovations - Andahuaylas

	Zero order correlation	Standardised regression coefficients	Partial correlations	Cumulative proportion of variance explained
Mass media use	.195	.090	.085	.01
Monetary wealth	.195	.131	.124	.02
Land	-.079	-.226*	-.159	.03
Knowledge	.095	.182	.122	.04
Education	.169	.077	.073	.05
General participation	.088	.046	.047	.06

* Negative value because the category 'up to 1 ha of land' was considered relevant.

Figure

the sample and the value of the mean \sqrt{Deff} , this generally used minimum level of significance will be associated with a higher p -value. It was therefore decided to disregard the indirectly related variables and to continue the analysis with the variables originally considered, i.e. those directly related to the dependent variable.

These six variables account for 9.5% of the variance of the adoption of innovations. From the values of the standardised partial regression coefficients and the t -values associated with them, it seems as if the direct influence of the variables mass media use, education and general participation could be neglected. Contrary to the Mantaro region, the amount of variance explained in the intervening variables is slight. 19.9% of the variance of knowledge is explained by modernism and communal participation, 4.1% is explained by outside contact and household wealth; 14.4% of aspiration for children is explained by monetary wealth, education and mass media use, 14.2% of the variance of modernism is explained by outside contacts, education, age and general participation; and finally 9.1% of the variance of general participation is explained by land, age and education.

The low percentage of explained variances suggests that the model developed is not the most appropriate one, and that other variables must also be considered. These are the *comunidad* level variables not yet used, or individual level variables that have not been considered in this study. In this region it is expected that the *comunidad* level variables, especially those related to the activities of the state agencies involved in the PNDIPC, will play an important role in the explanation of the variance of adoption of innovations. Before the PNDIPC started, the region was relatively isolated. The *comuneros* could learn about the modern agricultural techniques through the activities of the agencies involved in the project. In this region the modern techniques proposed by the PNDIPC were genuine innovations, as they were virtually unknown before the project started.

As the acceptance of the innovations is a recent phenomenon, there is no crystallised configuration of variables which will account for it. This is evident from the fact that a large number of variables (12) are directly or indirectly related to the adoption index. Half of them are directly related to adoption, while the others play no clearly recognisable role in the explanation of the variance either of the intermediate or the dependent variables. The most important individual variables for the prediction of the acceptance of innovations are land, monetary wealth and knowledge. Given the fact that the agricultural techniques are genuine innovations in this region this is hardly surprising.

5.3. THE ROLE OF THE COMUNIDAD LEVEL VARIABLES

Until now only the individual level variables were used in the analysis to explain knowledge of and adoption of innovations. The implicit assumption was that the conditions of the *comuneros* were basically the same. In other words, it was assumed that the types of *comunidad* in which the *comuneros* lived were the same, in the sense that they had the same degree of integration into the national society, the same degree of internal integration and were equally involved in the PNDIPC. In Chapter 4 it was shown that there were in fact differences between the two regions studied, and within each region the *comunidades* selected were also different in regard to the variables distinguished at the *comunidad* level. In this section the effect of the *comunidad* level variables will be analysed. Firstly they will be analysed without considering the influence they can have on the individual level variables, and later they will be used to form sub-groups to assess their influence on the relationships between the antecedent variables and the dependent variables.

1 The *comunidad* level variables are related to the situation in which the introduction-diffusion process of innovation takes place. The first variable to be considered is the degree of *integration into the national society*. In Chapter 4 it was stated that the more a *comunidad* was integrated into the national society the more possibilities its inhabitants would have of contact outside their community, and that it would be more likely that they would be acquainted with 'modern' techniques. 'Modern' refers to present-day technology as proposed and probably used by other sectors of the national society. It is assumed that in the national society modern techniques are available and if the *comuneros* possess the relevant characteristics they will be able to acquire knowledge about them and, after evaluating their relevance, will be able to accept and adopt them. The information is available to everybody, and it can thus be said that it exists in a diffuse way, no special attempts are made to make them available in an intelligible way to the *comuneros*. The degree of integration into the national society of a *comunidad* represents a differential access to information about techniques which can be useful to the *comuneros*.

On the other hand, the type of action zone to which the *comunidad* belonged refers to the availability of more specialised information which is relevant to the *comuneros*. In the *comunidades* where the PNDIPC was working the *comuneros* were supposed to acquire information about techniques useful to them, and there were programmes especially

designed to supply them with the necessary information. Thus, if a *comunidad* was engaged in the programmes of the PNDIPC, special information sessions about modern techniques were organised for the *comuneros*. Consequently, it can be expected that the *comuneros* of the *comunidades* engaged in the PNDIPC have more knowledge of the innovations than their peers living in *comunidades* which were not engaged in the PNDIPC.

The last variable considered is the internal integration of the *comunidad*. This variable refers to the degree of cohesion within the *comunidad*. It measures the involvement of the *comunero* with his *comunidad*, and it is thought that, if the *comunidad* shows a high degree of internal integration, social control will also be stronger and will have some influence on the actions of its members. This variable cannot be used separately; it must be used in combination with the two other variables mentioned previously.

5.3.1. *The direct influence of the comunidad level variables on knowledge and adoption*

In the Mantaro region 94% of the *comuneros* know about at least one of the innovations, whereas in the Andahuaylas region the figure is 87%. Although knowledge about innovations seems to be widespread, they are more widely known in the Mantaro region.

As can be seen from Table 23, in both regions there are differences between the level of knowledge of the *comuneros* living in the different types of action zones, and those living in the differently integrated *comunidades*. The *comuneros* in the intensive action zones have more knowledge than those living in the extensive action zones.

With regard to the influence of integration into the national society, it was shown that there is a similar relationship in both regions. There is no difference between the levels of knowledge of those living in the low integration *comunidades* and those in the medium integration *comunidades*; however these two sub-zones have a lower degree of knowledge than the *comuneros* living in the high integrated *comunidades*. In both regions the *comuneros* of *comunidades* involved in the national society, as measured by the indicators used, have a higher level of knowledge than the inhabitants of the other *comunidades*.

As previously stated, the impact of the internal integration of the *comunidad* can only be assessed correctly in combination with the two other indices. As can be seen in Table 23, in the Mantaro region it is evident that those living in *comunidades* with a medium or low level

Table 23. The influence of the comunidad level variables on knowledge about innovations – Mantaro and Andahuaylas

	Type of action zone		Integration into national society			Internal integration		
	Intensive	Extensive	High	Medium	Low	High	Medium	Low
<i>Mantaro</i>	97%	91%	98%	86%	85%	86%	97%	95%
	(237)	(192)	(288)	(121)	(20)*	(154)	(199)	(76)
$p \chi^2$	.001 < p < .01			p < .001			p < .001	
Tau	.135			.118			.083	
<i>Andahuaylas</i>	93%	84%	94%	85%	84%	84%	90%	94%
	(93)	(211)	(73)	(101)	(130)	(107)	(125)	(72)
$p \chi^2$	.02 < p < .05			.02 < p < .05			p > .05	
Tau	.124			.102			—	

* Sub-class is small; percentages must be interpreted with caution!

of internal integration have more knowledge about the innovations than those living in the *comunidades* with a high degree of internal integration. In the Andahuaylas region the differences are unsystematic and slight and the most correct conclusion about this region regarding the influence of the variable 'internal integration', is that it is not related to knowledge about innovations.

In order to assess the influence of the internal integration variable in combination with the other two variables, one has to refer to parametric correlation analysis because the sample size and distribution of the variables will give relatively small and uneven sub-samples, which makes it difficult to draw valid conclusions. The coefficients used to measure the influence of the combination of the variables will be the partial correlation coefficient and the multiple-partial correlation coefficient,¹⁰ using the data in their dichotomised form (see Appendix 2).

In the Mantaro region the three *comunidad* level variables account for 37.2% of the variance of knowledge about innovations. The zero order correlation between this variable and the type of action zone the *comunero* is living in is shown to be .512. When controlling the two other variables – integration into the national society and internal integration – the value of the partial correlation coefficient is .125. When allowing the variables 'type of action zone' and 'internal integration' to explain the variance of the knowledge variable, while *controlling* the effect of integration into the national society – the multiple-partial correlation coefficient – the value obtained is .196.

The variable 'integration into the national society' has a zero-order correlation of .589 with knowledge, and when controlling the two other variables – type of action zone and internal integration of the *comunidad* – the value of the partial correlation coefficient amounts to .254. Finally, when allowing the integration into the national society variable to act together with internal integration, controlling for the influence of type of action zone, the multiple-partial coefficient reaches a value of .386.

It can be concluded from the above analysis that integration into the national society, when acting alone, explains more of the variance than when the type of action zone is acting alone (4.4% and 1.0% respectively). This indicates that, in the explanation of the level of knowledge of the *comuneros* it is more important to be living in an integrated *comunidad* than in one located in an intensive action sub-zone.

When using a combination of these variables with internal integration, the variables 'type of action zone' and 'internal integration' account for 2.5% while the combination of the variables 'integration into

the national society' and 'internal integration', accounts for 11.6%. The second combination provides a better prediction of knowledge about innovations.

These results are consistent with the situation in the Mantaro region, where modern techniques were already in use before the PNDIPC started, and where the *comuneros* 'introduced' the innovations mainly by their own efforts. The fact that the combined effect of type of action zone and internal integration explains more of the variance than if type of action zone is acting alone, hints at the positive role that internal integration of the *comunidad* plays in disseminating information, even in the case of the variable that accounts for the least variation.

In the Andahuaylas region the three variables at the *comunidad* level accounted for 52.8% of the variance of the knowledge about innovations. The zero-order correlation between knowledge and type of action zone is .443 and, when controlling for the effects of the two other variables, the value of the partial correlation coefficient is .370. When using a combination of type of action zone and internal integration and at the same time controlling for integration into the national society, the value of the multiple-partial correlation amounts to .720.

The following results were obtained for integration into the national society. The zero-order correlation between this variable and knowledge of innovations is .139 while the partial correlation (i.e., when the effect of 'type of action zone' and 'internal integration' variables are controlled) has a value of .143. The combination of the variables 'integration into the national society' and 'internal integration' (controlling for type of action zone) results in a value of .642.

These results clearly show that, in the case of Andahuaylas, the variable type of action zone is a better predictor of the knowledge about innovations than the variable integration into the national society. The respective percentages of the variance explained by these variables when acting alone are 7.3% versus 1.0%. The impact of the variable internal integration is enormous when it is acting in combination with either of the other two variables.

The most successful combination in predicting or explaining knowledge about innovations is type of action zone and internal integration. This combination accounts for nearly all of the variance explained by the three variables.

The results for the two regions are consistent with previous knowledge of the regions. In the Mantaro region, due to its earlier integration into the national society, the availability of information about these techniques was already established, whereas in the Andahuaylas region,

Table 24. The influence of the comunidad level variables on adoption of innovations – Mantaro and Andahuaylas

	<i>Type of action zone</i>		<i>Integration into national society</i>			<i>Internal integration</i>		
	<i>Intensive</i>	<i>Extensive</i>	<i>High</i>	<i>Medium</i>	<i>Low</i>	<i>High</i>	<i>Medium</i>	<i>Low</i>
<i>Mantaro</i>	66%	53%	64%	60%	20%	75%	56%	43%
	(237)	(192)	(288)	(121)	(20)*	(154)	(199)	(76)
<i>p</i> χ^2	.001 < <i>p</i> < .01			<i>p</i> < .001			<i>p</i> < .001	
<i>Tau</i>	.130			.146			.223	
<i>Andahuaylas</i>	21%	4%	18%	8%	5%	12%	8%	7%
	(93)	(211)	(73)	(101)	(130)	(107)	(125)	(72)
<i>p</i> χ^2	<i>p</i> < .001			.001 < <i>p</i> < .01			<i>p</i> > .05	
<i>Tau</i>	.271			.163			—	

due to its isolated position and its backwardness, information about the techniques only became available once the state agencies involved in the PNDIPC turned their attention to the region.

The degree of use of modern agricultural techniques was quite different in the two regions. In the Mantaro region 61% of the *comuneros* were using them while only 9% of those from Andahuaylas did so. The variables considered at the *comunidad* level, especially type of action zone and integration into the national society, have a clear impact on the use of innovations. In the Mantaro region the variable internal integration of the *comunidad* seems also to be related clearly to the use of innovations, but in the Andahuaylas region this does not seem to be the case. However, as in the case of the knowledge variable, the impact of internal integration must be assessed in combination with the other two variables.

The differences between the two regions can be explained by their different degrees of involvement in the national society and their level of development. The comparison of the *d*-values of the variables shows 44% for integration into the national society (because of the small sample size of the low integration group, this must be interpreted with caution) while in the Andahuaylas region it is 13%. The *d*-values for the variable type of action zone are 13 and 17 for Mantaro and Andahuaylas respectively. This seems to indicate that in Mantaro the variable integration into the national society has a greater impact on the use of innovations, whereas in Andahuaylas – consistent with earlier findings – type of action zone seems to be of more importance, although the difference is slight. The best conclusion with regard to the Andahuaylas region is that the two variables are possibly of 'equal' importance.

In order to evaluate these results and to assess the influence of the variable 'internal integration' when combined with the other *comunidad* level variables, correlation and regression analysis were used on the dichotomised data. In the Mantaro region the *comunidad* level variables explain 19.9% of the variance of the adoption of innovations.

The zero-order correlation between the type of action zone and the adoption of modern techniques is .402. When controlling the influence of the variables internal integration and integration into the national society, the partial correlation coefficient has a value of .125. The combination of internal integration and type of action zone, controlling for the integration into the national society gives a multiple-partial correlation coefficient of .128.

The zero-order correlation of the variable integration into the na-

tional society with adoption of innovations is .431. When controlling the variables 'type of action zone' and 'internal integration', the partial correlation coefficient has a value of .200. The combination of internal integration and integration into the national society, and controlling type of action zone, gives a multiple-partial correlation coefficient of .210.

The difference in impact of each variable and the combinations of variables is only slight and no precise conclusion can be drawn as to the relative importance of each variable and the combinations. However, it is clear that the role of internal integration of the *comunidades* is almost negligible in comparison to its importance in explaining the variance of use of innovations.

In the Andahuaylas region the three *comunidad* level variables account for 7.8% of the variance of the adoption of innovations.

The zero-order correlation between adoption and type of action zone is .174. When controlling the two other variables the partial correlation coefficient becomes .204. The combination of type of action zone with internal integration, and controlling for integration into the national society, yields a multiple-partial correlation of .217.

The zero-order correlation coefficient for integration into the national society and adoption is .182. When controlling the variables internal integration and type of action zone, the partial correlation is .180. The combination of internal integration with integration into the national society, controlling type of action zones, gives a multiple-partial correlation of .223.

In Mantaro the predictive powers seem to diminish when controlling the effect of the others or when they are used in combination with the internal integration index.

The conclusion in regard to Andahuaylas is that the predictive power of each of the variables seems to increase when controlling the effect of the others, or when used in combination with the internal integration index.

However, for both regions, the differences between the partial and multiple-partial correlation coefficients are too small to provide valid conclusions about the relative predominance of either of the *comunidad* variables with regard to the use of innovations. The use of innovations depends not only on the availability of the information about it, nor even its physical availability, but depends also on other non *comunidad* related characteristics such as willingness, sufficient resources etc. So it is plausible that, regarding knowledge about innovations, the *comunidad* level variables were of considerable importance while they provided the

structural arrangements enabling the *comuneros* to learn about the *existence* of these techniques. Knowledge of the existence of these techniques is a necessary, but not sufficient, reason for their use. The *comunero* might be unable, or unwilling, to use them even though he knows of their existence, and despite the fact that he may be convinced of their usefulness. The inability or unwillingness to use these new techniques can be related either to structural arrangements (no market for produce, unstable price level) or to individual characteristics (no resources, or he does not 'need' the additional production).

However, in this study the *comunidad* level variables are of importance for the explanation of the degree of adoption of modern techniques, especially for Andahuaylas where they are important because they explain 7.8% of the variance of adoption of the innovation, while the individual variables explain 9.5% of the variance. In subsequent parts of the analysis the relevance of these *comunidad* level variables to the relationships between the individual antecedent variables and adoption of innovations will be assessed.

5.3.2. *The indirect influence of the comunidad level variables*

In order to analyse the relationship between the antecedent variables – the initial factors, the attitudes, knowledge, and adoption of innovations under different situational settings – the following procedure was used. Using the variables integration into the national society and type of action zone as test-variables, the relationship between the antecedent variables and adoption was studied.

In the case of the Mantaro region, the low integration category was too small to be considered separately. In Tables 25 and 26 the following form of presentation was therefore used: the high integration category, the medium integration category and, finally, the combined categories of medium and low integration. As will be seen, the observed relationship will be the 'same', so either categorisation – medium, or medium plus low – could be used.

In the Mantaro region the following variables were directly related to the adoption of innovations: education, monetary wealth, household wealth, mass media use, participation in communal activities, aspirations for children and modernism. With regard to the 'initial' factors, using the *d*-values, the following was demonstrated.

Education. In the high integration sub-zone the difference between those with 'high' education and those with less or none is the same as in the region. When taking the medium integration group, the differen-

Table 25A. The relationships between the initial factors and adoption of innovations, according to integration into the national society – Mantaro

Variable	Original relationship			High integration			Medium integration			Medium and low integration						
	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant
Age	irregular	*	*	*	irregular	*	*	*	irregular	*	*	*	U-shaped	*	*	*
Education	positive	26	71	45	positive	27	73	46	positive	33	70	37	positive	21	65	44
Monetary wealth	positive	17	68	51	positive	9	67	58	positive	22	73	51	positive	27	71	44
Household wealth	positive	36	66	30	A-shaped	*	*	*	positive	60	80	20**	positive	59	76	17
Traditional wealth	positive	8	66	58	positive	8	70	62	positive	12	67	55	positive	10	63	53
Land	negative	-3	59	62	positive	4	67	63	negative	-15	51	66	negative	-13	48	63
Outside contact	positive	9	67	58	positive	8	70	62	positive	10	65	55	positive	14	64	50
Mass media use	positive	50	66	16	positive	36	65	29	positive	60	72	12	positive	62	69	7
General participation	positive	8	67	59	positive	18	78	60	negative	-11	50	61	negative	-10	48	58
Participation in communal activities	positive	15	64	49	positive	10	66	56	positive	50	65	15	positive	42	61	19

* Due to the irregular relationship these values are not presented.

** Sub-class size is less than 20; percentages must be interpreted with caution.

Table 25B. The relationships between the initial factors and adoption of innovations, according to integration into the national society – Mantaro

Variable	Original relationship			High integration			Medium integration			Medium and low integration						
	Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau
Age	irregular *		$p > .05$	—	irregular *		$p > .05$	—	irregular *		$p > .05$	.094	U-shaped *		$p > .05$	.124
Education	positive	26	$p < .001$	.182	positive	27	$.001 < p < .01$	.196	positive	33	$p > .05$	.189	positive	21	$p > .05$	.127
Monetary wealth	positive	17	$p < .001$	.169	positive	9	$.01 > p > .02$	—	positive	22	$.01 < p < .02$	.222	positive	27	$p < .001$	.270
Household wealth	positive	36	$p < .001$	.145	A-shaped *		$p > .05$	—	positive	60	$p < .001$	.369	positive	60	$p < .001$	.353
Traditional wealth	positive	8	$p > .05$	.072	positive	8	$p > .05$	—	positive	12	$p > .05$	.119	positive	10	$p > .05$	.092
Land	negative	—3	$p > .05$	—	positive	4	$p > .05$	—	negat.	—15	$p > .05$	—0.147	negat.	—13	$p > .05$	—0.131
Outside contact	positive	9	$p > .05$	.079	positive	8	$p > .05$	—	positive	10	$p > .05$	.103	positive	14	$p > .05$	.138
Mass media use	positive	50	$p < .001$	.184	positive	36	$p > .05$	.075	positive	60	$p < .001$	.328	positive	62	$p < .001$	.321
General participation	positive	8	$p > .05$	—	positive	18	$.01 < p < .02$	.147	negat.	—11	$p > .05$	—0.072	negat.	—10	$p > .05$	—0.070
Participation in communal activities	positive	15	$.001 < p < .01$	.125	positive	10	$p > .05$	.075	positive	50	$p < .001$	.316	positive	42	$p < .001$	.268

* Due to the irregular relationship the value of 'd' is not presented.

ces between the categories of education with regard to the adoption of innovations are more marked, the *d*-value here is 33% as against 27% in the high integration group. When using the combined group – medium plus low integration – the influence of education is less marked than in the high integration group or the region. This is due to the low percentage of users in the low integration group.

Monetary wealth. The difference between the relevant categories in the high integration sub-zone is less than in the total region, *d*-values being 9% as against 17%. In the medium integration category – and also in the combined category – the impact of this variable is stronger than in the total region, and in the high integration sub-zone there are *d*-values of 22% (eventually 27%) against 17% and 9%.

Household wealth. Showed no linear relationship in the high integration sub-zone. The percentages of ‘adopters’ for the three categories of this variable in the sub-zone were 62%, 69% and 48%, suggesting that the *comuneros* with low household wealth use innovations less than those who are better off. However, in the medium integration group, the difference between the categories of this variable is larger than in the region, 60% (eventually 59% in the combined category) against 36%.

Mass media use. The difference in the high integration sub-zone is less than in the total region, being 36% as against 50%; in the medium integration sub-zone, however, the observed difference is larger than in the region, being 60% (62% for the combined category) as against 15%.

Of the initial factors which were unrelated to the adoption index, when controlling for integration into the national society, general participation is of interest. It seems to be more strongly and positively related to adoption of innovations in the sub-zone of high integration than in the region (18% as against 8%) whereas in the medium integration sub-zone – and also in the combined sub-zone – it is negatively related to the adoption variable. Thus participation in general *comunero* activities, i.e. those that bring the *comunero* into contact with outside institutions, has a positive influence in the *comunidades* which are strongly integrated into the national society, whereas in less integrated *comunidades* it has no relationship to adoption of innovations; it can even be related negatively to it.

From Table 26 it can be seen that the relationship between the two attitudes considered and adoption of innovations hardly changes in the different sub-zones. There are only slight differences and, given the fact

Table 26. The relationship between attitudes and adoption of innovations, according to integration into the national society – Mantaro

Variable	Original relationship				High integration				Medium integration				Medium and low integration			
	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant
Aspirations children	positive	10	64	54	positive	12	67	55	positive	9	62	53	positive	7	58	51
Modernism	positive	17	68	51	positive	18	71	53	positive	15	67	49	positive	12	62	50

Variable	Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau
Aspirations children	positive	10	$.02 < p < .05$	.094	positive	12	$p > .05$	.113	positive	9	$p > .05$	.087	positive	7	$p > .05$	—
Modernism	positive	17	$p < .001$	.165	positive	18	$.001 < p < .01$	.189	positive	15	$.02 < p < .05$	.188	positive	12	$p > .05$	.120

that this study is based on a sample, these differences are not considered relevant.

These results suggest that the level of integration of a *comunidad* into the national society has an important effect on the strength of the relationships between the initial factors and the adoption of innovations. With the exception of the variables 'education' and 'general participation', the relationship in the high integration sub-zone is weaker than in the region. Apparently the fact that the *comunidad* has been highly integrated into the national society means that knowledge of the innovations is available to almost everyone, and their use by the *comuneros* was probably started relatively early; generalised use of these innovations was thus generated. The use of these techniques has therefore become a more or less normal routine.

In the other sub-zones the *comunidades* have only recently (since 1966) become integrated into the national society which offers greater opportunities for the *comuneros* to acquire new or better information about innovations. Due to the availability of new opportunities, those able to take risks, those with more monetary wealth, and those exposed to more sophisticated information channels are now able to become users of innovations. These conclusions suggest that, when new opportunities are presented, the relatively better-off people will be able to profit more by them, if they are presented in a diffuse and un-directed way. This conclusion is not, of course, a new one; it is a well known fact among professionals engaged in development work that, when an individualised approach is used, those better-off will profit more by any changes introduced.

With regard to the differential influence of the variable general participation, this can probably be explained by the historical development of the Mantaro region. Generally, the *comunidades* functioned as real social units, with relevance to their members. Before the PNDIPC started, collective action was necessary to guarantee the well-being of the *comunidad* and its members. Hence the *comunidades* operating within the national society structure were run mostly by local people, that is by the *comuneros*. Due to the interest shown by the Peruvian government, as demonstrated by the PNDIPC, not all actions are now *comunidad* centred. With the impact of the national government on the *comunidad* and the greater opportunity of living outside the *comunidad*, the process of individualisation of the *comunidades* has gained an additional stimulus.

The degree of integration into the national society has served as a means of typifying the surroundings in which the *comuneros* live with

regard to the diffuse availability of information about new techniques. This region was scheduled to receive assistance from the state agencies involved in the PNDIPC even though it was well integrated into the national society. Thus, in addition to the existing availability of new information, a new channel – one especially designed to consider the *comunero* population – became available to the *comuneros*. In the intensive action sub-zone the agencies involved presented information about new techniques, and they were also available for advice, although their approach was not always the best one.

Given that the approach of the PNDIPC was mainly individual, it was expected that living in an intensive action zone would facilitate the use of the new techniques, if the *comunero* possessed those characteristics that would induce him to use the innovations. With regard to the initial variables directly related to the adoption of innovations in the region, the results are the following.

In the intensive action zone the influence of education on adoption of modern techniques is stronger than in either the region or the extensive action zone. The corresponding values for the *d*'s are 38% as against 26% and 10%.

Monetary wealth seems to be of more importance in the extensive action zone, the *d*-value being 20% versus 13% in the intensive action zone and 17% in the region.

The variable 'household wealth' will not be considered fully because in the intensive action zone the form of the relationship is curvi-linear, and in the extensive action zone one of the categories is very small, which makes the percentage calculations unreliable. However, as in the case of the monetary wealth variable, it seems that the effect of this variable is stronger in the extensive zone.

The influence of mass media use is stronger in the case of the extensive action zone than in the intensive action zone; the corresponding *d*-values are 53% as against 44%.

The 'participation in communal activities' variable also has more influence in the extensive action zone than in the intensive action zone.

It is interesting to observe that, of all the variables positively related to the use of the modern techniques, only one – education – has a stronger influence in the intensive action zone, while all the other variables have a stronger influence in the extensive action zone. The difference between the percentages of users in the relevant category of each variable in the two zones is considerable, ranging from 9% in the case of monetary wealth to 18% in the case of education.

These results seem to indicate that in the intensive action zone the

Table 27A. The relationships between the initial factors and adoption of innovations, according to type of action zone – Mantaro

Variable	Original relationship				Intensive action zone				Extensive action zone			
	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant
Age	irregular	*	*	*	irregular	*	*	*	irregular	*	*	*
Education	positive	26	71	45	positive	38	77	39	positive	10	59	49
Monetary wealth	positive	17	68	51	positive	13	72	59	positive	20	63	43
Household wealth	positive	36	60	36	A-shaped	*	*	*	positive	61	66	5**
Traditional wealth	positive	8	66	58	positive	12	74	63	positive	3	56	53
Land	negative	-3	59	62	positive	4	70	66	negative	-14	44	58
Outside contact	positive	9	67	58	positive	17	80	63	positive	10	59	49
Mass media use	positive	50	66	16	positive	44	71	27	positive	53	61	8
General participation	positive	8	67	59	positive	18	81	63	negative	-16	40	56
Participation in communal activities	positive	15	64	49	positive	13	69	56	positive	17	57	40

* Due to the irregular relationship these values are not presented.

** Sub-class size is less than 20; percentages must be interpreted with caution.

Table 27B. The relationships between the initial factors and adoption of innovations, according to type of action zone – Mantaro

Variable	Original relationship				Intensive action zone				Extensive action zone			
	Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau
Age	irregular *		$p > .05$	—	irregular *		$p > .05$	—	irregular *		$p > .05$	.110
Education	positive	26	$p < .001$	.182	positive	38	$p < .001$	.238	positive	10	$p > .05$	.072
Monetary wealth	positive	17	$p < .001$	.169	positive	13	$.02 < p < .05$	.130	positive	20	$.001 < p < .01$	.201
Household wealth	positive	36	$p < .001$	.145	A-shaped *		$p > .05$	—	positive	61	$p < .001$	.293
Traditional wealth	positive	8	$p > .05$	.072	positive	12	$p > .05$	.109	positive	3	$p > .05$	—
Land	negative	—3	$p > .05$	—	positive	4	$p > .05$	—	negat.	—14	$p > .05$	— .138
Outside contact	positive	9	$p > .05$	.079	positive	17	$.02 < p < .05$	.139	positive	10	$p > .05$	.097
Mass media use	positive	50	$p < .001$	.184	positive	44	$.001 < p < .01$	.145	positive	53	$p < .001$	.221
General participation	positive	8	$p > .05$	—	positive	18	$.01 < p < .02$	.157	negat.	—16	$p > .05$	— .102
Participation in communal activities	positive	15	$.001 < p < .01$	.125	positive	13	$p > .05$	.110	positive	17	$.02 < p < .05$	.146

* Due to the irregular relationship the value of 'd' is not presented.

importance of the individual level variables is tempered. This is probably due to the influence of the activities undertaken by the state agencies involved. This conclusion is supported by the fact that, in the region as a whole, the variable general participation is not relevantly related to adoption of modern techniques, which it is in the intensive action zone. In the extensive action zone, it is, at best, unrelated to adoption of modern techniques, although the high negative value of the d in that zone suggests that it is negatively related to the use of innovations.

The variable 'outside contact' is shown to be positively related to the use of innovations in the intensive action zone. In *comunidades* located in intensive action zones, outside trips seem to be positively related to use of innovations, whereas in the extensive action zone this is not the case.

The results seem to indicate that directed action is capable of reducing the importance of variables that would have induced the use of the modern techniques if they were available in a diffuse way. What happens, as shown in Table 27, is that more people are using innovations in the intensive action zone, even though they do not possess the relevant characteristics. In other words, people who previously would not have used these techniques are doing so now because they live in the intensive action zone, i.e. they are influenced by the directed actions that propagate the use of these techniques.

The location of the *comunidad* in which the *comuneros* live exercises some influence on attitudes and their influence on the adoption of modern techniques. This is especially true of the 'aspirations for one's children' variable. The *comuneros* living in *comunidades* located in the intensive action zone use the techniques more in their agricultural undertakings than was expected when taking into account the independent influences of the two individual variables. In the zone of intensive action *comuneros* who have aspirations for a better future for their children are probably stimulated to use the innovations. In the extensive action zone this stimulus is lacking. As regards modernism, no influence of the differential surrounding can be detected. People who have modern orientations use innovations more than non-modern people, irrespective of the location of their *comunidad*.

The difference in the impact of these two *comunidad* level variables provides some insight into the process of introduction-diffusion of innovation, even though the present analysis does not measure their influence in a pure form. However, some conclusions seem evident. In this region, which has a relatively high level of development, among

Table 28. The relationships between the attitudes and adoption of innovations, according to type of action zone – Mantaro

Variable	Original relationship				Intensive action zone				Extensive action zone			
	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant
Aspirations for children	positive	10	64	54	positive	16	72	56	positive	4	55	51
Modernism	positive	17	68	51	positive	18	74	56	positive	15	60	45

Variable	Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau
Aspirations for children	positive	10	$.02 < p < .05$	.094	positive	16	$.01 < p < .02$	.152	positive	4	$p > .05$	—
Modernism	positive	17	$p < .001$	.165	positive	18	$.001 < p < .01$	.181	positive	15	$.02 < p < .05$	.150

comuneros living in *comunidades* which are highly integrated into the national society the use of the modern techniques is fairly widespread and this does not seem to be related to the individual variables normally considered relevant to the use of techniques; the *comuneros* are using them irrespective of whether they possess these characteristics or not. In *comunidades* with a lesser degree of integration into the national society, the availability of new information apparently gives those who possess the necessary means the opportunity to adopt the new techniques. In the highly integrated zones there is no systematic difference between users and non-users, whereas in the less integrated region the difference between users and non-users is closely related to the possession of wealth in its 'monetary' form, and to related variables such as mass media use. This finding is consistent with the observation generally made that rapid social change seems to disrupt the communal organisation. The disruptions are caused because availability of new techniques and procedures is more rapidly accepted by those who possess the necessary means to acquire them. The socio-cultural orientations or attitudes of the *comunero* do not seem to be affected by the degree of integration of his *comunidad*, at least with reference to their influence on the adoption of new techniques.

The other *comunidad* variable, location of the *comunidad* in an intensive or extensive action zone, refers more directly to the availability of these new techniques and information about them. The new techniques are brought to the *comuneros* in their respective locations. The consequences of this variable differ from those drawn from the influence of integration into the national society. In the intensive action zones the *comuneros* are adopting new techniques irrespective of whether or not they possess the relevant individual characteristics. Apparently in this region the activities of the state agencies involved in the PNDIPC were somehow suppressing the influence of the variables normally related to the adoption of innovations, whereas in the extensive action zone these variables retained or even increased their importance – especially those variables related to 'monetary wealth'.

Given the small sample size, it was not considered convenient to assess the combined effect of these two *comunidad* level variables on the relationship between the antecedent variables and the adoption of innovations. In a later part of this chapter the combined effect of the individual and *comunidad* level variables will be analysed, using regression analysis.

In the Andahuaylas region the innovations were in use only on a limited scale, 9% of the *comuneros* were using one or more of the in-

novations, but only 1% were using all the innovations considered. The region can be considered relatively underdeveloped, due to the prominence of large estate owners until the thirties, and neglect by Peruvian governments. Since the PNDIPC started in 1966 the state agencies have tried more systematically to improve the conditions of the *comuneros* and *comunidades*.

In section 5.2.4. it was shown that the antecedent variables related to use of innovations in this region were: education, monetary wealth, land, mass media use and general participation. In this transitional region, the variables related to the adoption of innovations, with the exception of the land variable, can all be considered variables from the national society structure and not from the *comunidad* structure proper.

When the degree of integration into the national society is controlled, it is shown that:

- *Education* seems to be most strongly related to adoption of innovations in the high integration zone, and least in the medium integration zone, while in the low integration zone this variable also seems to be relevant. The obtained *d*-values are 24%, 11% and 18% respectively.
- *Monetary wealth* seems to be most prominent in the medium integration zone, while in both the high and low zones it has the same strength, although the percentages of users are different. The respective *d*-values are 16% for the medium integration zone and 6% for the other two zones.
- *Land* has most influence in the medium integration zone, the *d*-value in this region being 26% whereas it is 10% and 7% in the high and low integration zones.
- *Mass media use* has more impact in the medium integration zone where the *d*-value amounts to 31% as against 13% and 7% in the high and low integration zones respectively.
- The *general participation* variable has its strongest influence in the high integration zone, although it is also of importance in the medium integration zone. The corresponding *d*-values are 33% and 19%, but in the low integration zone it is only 7%.

Of these variables which were originally related to adoption of innovations, it is shown that the strength of the relationships is different when the degree of integration into the national society is taken into account. In the low integration zone the existing relationship between the variables considered and adoption of innovations is weaker than in the region. However, given the situation in the region, it is not surprising that *comuneros* living in *comunidades* still not incorporated into the

Table 29A. The relationships between the initial factors and adoption of innovations, according to integration into the national society—Andahuaylas

Variable	Original relationship			High integration			Medium integration			Low integration						
	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant
Age	positive	6	10	4	irregular	*	*	*	irregular	*	*	*	irregular	*	*	*
Education	positive	20	24	4	positive	24	34	10	positive	11	15	4	positive	18	21	3
Monetary wealth	positive	11	18	7	positive	6	22	16	positive	16	21	5	positive	6	10	4
Household wealth	positive	18	26	8	positive	40	55	15	A-shaped	*	*	*	negative	—5	0**	5
Traditional wealth	positive	6	13	7	positive	5	21	6	positive	16	19	3	positive	1	5	4
Land	positive	14	20	6	positive	10	25	15	positive	26	30	44	positive	7	10	3
Outside contact	positive	6	14	8	positive	2	20	18	positive	11	17	6	positive	5	9	4
Mass media use	positive	17	20	3	positive	13	24	11	positive	31	31	0	positive	7	10	3
General participation	positive	16	24	8	positive	33	48	15	positive	19	26	7	positive	7	4	11
Participation in communal activities	negative	—6	7	13	negative	—7	16	23	negative	—3	7	10	negative	—4	4	8

* Due to the irregular relationship these values are not presented

** N = 3, percentage is meaningless

Table 29B. The relationships between the initial factors and adoption of innovations, according to integration into the national society – Andahuaylas

Variable	Original relationship			High integration			Medium integration			Low integration			Tau			
	Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \gamma^2$	Tau		Type of relationship	Value of 'd'	$p \gamma^2$
Age	positive	7	$p > .05$	—	irregular *	$p > .05$	—	irregular *	$p > .05$	—	irregular *	$p > .05$	—			
Education	positive	20	$p < .001$	.204	positive	24	$p > .05$	.196	positive	11	$p > .05$	.161	positive	18	$0.01 < p < .02$	.157
Monetary wealth	positive	11	$0.001 < p < .01$	.155	positive	6	$p > .05$	—	positive	16	$0.02 < p < .05$	.222	positive	6	$p > .05$	.093
Household wealth	positive	18	$p > .05$	—	positive	40	$p > .05$	.133	A-shaped *	$p > .05$	—	.094	negative	—5	$p > .05$	—
Traditional wealth	positive	6	$p > .05$	.104	positive	5	$p > .05$	—	positive	16	$0.001 < p < .01$	.265	positive	1	$p > .05$	—
Land	positive	14	$p < .001$	.198	positive	10	$p > .05$	.107	positive	26	$p < .001$	.354	positive	7	$p > .05$	.125
Outside contact	positive	6	$p > .05$	.097	positive	2	$p > .05$	—	positive	11	$p > .05$	.165	positive	5	$p > .05$	.096
Mass media use	positive	17	$p < .001$	.204	positive	13	$p > .05$	.110	positive	31	$p < .001$	.357	positive	7	$p > .05$	.089
General participation	positive	16	$.001 < p < .01$	.156	positive	33	$.02 < p < .05$	.234	positive	19	$p > .05$	.181	positive	7	$p > .05$	.103
Participation in communal activities	negative	—6	$p > .05$	—0.089	negative	—7	$p > .05$	.087	negative	—3	$p > .05$	—	negative	—4	$p > .05$	—

* Due to the irregular relationship the value of 'd' is not presented

structures considered are not using the innovations. Education is the only variable which appears to cause any considerable differentiation in the rate of adoption. Even in the unintegrated *comunidades* those who have completed at least primary education are using the innovations to a degree comparable – if not surpassing – that of the *comuneros* living in the medium integration *comunidades*.

In the medium integration *comunidades* the variables strongest related to the adoption of innovations are monetary wealth, and mass media use, whereas the influence of general participation is at least as strong as in the region. In addition to these variables it is shown that in *comunidades* of this type, traditional wealth is also of importance. Its *d*-value in this type of *comunidad* is 16%, while it is 6% in the region and 5% and 1% respectively in the high and low integration zones. The percentage of users of innovations who possess the relevant categories of the variables considered is shown to be as great, or nearly as great, as those with corresponding characteristics in the high integration zone – as is also true of the variables monetary wealth, land and traditional wealth. In the case of mass media use the percentage of users is greater in the medium integration zone but, given the sample fluctuation, this difference will probably not be real. On the other hand, although the general participation index plays its part in this region, the percentage of users is lower than in the high integration zone.

The variables most prominent in this type of *comunidades* are those which measure wealth, both in its rural and 'non-rural' dimension. Especially prominent are the two indicators of rural wealth – land and traditional wealth. On the other hand, the variables mass media use and general participation, which permit the *comuneros* to obtain information from outside, are also important. However, mass media use is related to the land variable – see Figures 1 and 3 – and land and traditional wealth are also related. Apparently in this situation of changing opportunities, those who take advantage of the opportunities presented are those who are better off, both with reference to monetary wealth and what has been called rural wealth.

In the high integration zone the variables of most importance are shown to be education, household wealth and general participation. Household wealth must be excluded because the number on which the percentages of the relevant categories are based is rather small (less than 10) and does not allow statistical inference. In this high integration zone, where the diffuse possibilities of obtaining information about innovations is highest, it is not surprising that the two variables education and general participation are most relevant.

Table 30. The relationships between attitudes and adoption of innovations, according to integration into the national society – Andahuaylas

Variable	Original relationship			High integration			Medium integration			Low integration						
	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant
Aspiration children	positive	4	10	6	positive	19	22	3	negative	-2	8	10	positive	3	5	2
Modernism	positive	1	10	9	positive	5	21	16	positive	4	11	7	negative	-4	2	6

Variable	Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau	Type of relationship	Value of 'd'	$p \chi^2$	Tau
Aspiration children	positive	4	$p > .05$	—	positive	19	$p > .05$	.191	negative	-2	$p > .05$	—	positive	3	$p > .05$	—
Modernism	positive	1	$p > .05$	—	positive	5	$p > .05$	—	positive	4	$p > .05$	—	negative	-4	$p > .05$	.096

None of the attitudes considered was directly related to the adoption of innovations in the zone. This remained unchanged when the degree of integration of the *comunidades* was controlled. Apparently in this region the attitudes are of no importance to the adoption of innovations.

The conclusions are the same as in the case of the Mantaro region. In the high integration zone – *comunidades* already integrated into the national system in 1966 – the difference between the percentage of users in the relevant and non-relevant categories of the considered variables is slight, with the exception of the variables education and general participation. For both of these variables the percentages of adopters of innovations are considerably higher than in the region. The small number of *comuneros* who have completed primary education in this region does not permit more precise conclusions; the tendency, however, is clear.

In the medium integration zone the variables related to wealth, both in the form of rural wealth and monetary wealth, exert most influence on the adoption of innovations. The two forms of rural wealth are related only to the adoption of innovations in this region. This seems to be consistent with the conclusions in the Mantaro region. In zones or surroundings of increased opportunities those with the necessary means to profit from them will do so.

In the low integration zone none of the variables seem to be of special importance to the adoption of innovations.

As previously stated, the innovations considered in this study can be said to have been introduced by the PNDIPC. In Table 31 the data provide for the analysis of the impact of these introductions. As the distribution of the *comuneros* between the intensive and extensive zone is uneven, the criteria used will be a combination of the *d*-values and the values of probability related to an obtained χ^2 -value, although more attention will be paid to the values of the *d*'s.

- *Education* seems to be more important in the intensive action zone than in the extensive action zone, although in both zones there is a clear difference, depending on the categories of the education variable, between the number of adopters. It seems that, where information is explicitly available, those with 'more' education profit to a far greater extent than when the information has to be sought (i.e., when it is not readily available).
- *Monetary wealth* is much more important in the extensive action zone. The *d*-values are 6% versus 15% for the intensive and extensive action zones respectively.
- *Land* seems to be more important in the intensive action zone, al-

Table 31A. The relationships between the initial factors and adoption of innovations, according to type of action zone – Andahuaylas

Variable	Original relationship				Intensive action zone				Extensive action zone			
	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant	Type of relationship	Value of 'd'	Relevant	Non-relevant
Age	positive	6	10	4	positive	16	32	16	A-shaped	*	*	*
Education	positive	20	24	4	positive	48	59**	11	positive	12	12	0
Monetary wealth	positive	11	18	7	positive	6	26	20	positive	15	16	1
Household wealth	positive	18	26	8	U-shaped	*	*	*	positive	15	16**	1
Traditional wealth	positive	6	13	7	positive	12	29	17	positive	5	7	2
Land	positive	14	20	6	positive	13	30	17	positive	11	13	2
Outside contact	positive	6	14	8	negative	-4	18	22	positive	11	13	2
Mass media use	positive	17	20	3	positive	25	34	9	positive	13	14	1
General participation	positive	16	24	8	positive	53	70	17	positive	2	6	4
Participation in communal activities	negative	-6	7	13	negative	-9	18	27	negative	-4	3	7

* Due to the irregular relationship these values are not presented.

** Sub-group size is less than 20; percentages must be interpreted with caution.

Table 31B. The relationships between the initial factors and adoption of innovations, according to type of action zone – Andahuaylas

Variable	Original relationship				Intensive action zone				Extensive action zone			
	Type of relationship	Value of 'd'	p χ^2	Tau	Type of relationship	Value of 'd'	p χ^2	Tau	Type of relationship	Value of 'd'	p χ^2	Tau
Age	positive	6	p > .05	—	negat.	-16	p > .05	.113	A-shaped *		p > .05	—
Education	positive	20	p < .001	.204	positive	48	.001 < p < .01	.327	positive	11	.01 < p < .02	.185
Monetary wealth	positive	11	.001 < p < .01	.155	positive	6	p > .05	—	positive	15	p < .001	.298
Household wealth	positive	18	p > .05	—	U-shaped *		p > .05	—	positive	15	.01 < p < .02	.180
Traditional wealth	positive	6	p > .05	.104	positive	12	p > .05	.141	positive	5	p > .05	.120
Land	positive	14	p < .001	.198	positive	13	p > .05	.148	positive	11	.001 < p < .01	.205
Outside contact	positive	6	p > .05	.097	negative	-4	p > .05	—	positive	11	p < .001	.227
Mass media use	positive	17	p < .001	.204	positive	25	p > .05	.235	positive	13	p < .001	.205
General participation	positive	16	.001 < p < .01	.156	positive	53	p < .001	.350	positive	2	p > .05	—
Participation in communal activities	negative	-6	p > .05	-.089	negative	-9	p > .05	-.103	negative	-4	p > .05	-.099

* Due to the irregular relationship the value of 'd' is not presented.

though there is a considerable difference between the two categories considered in the extensive action zone. The *d*-values for the intensive and extensive action zones are 13% and 11% respectively.

- *Mass media use* has a stronger influence in the intensive action zone; its *d*-value is 25%. In the extensive action zone the difference in the percentage of adopters between mass media users and non-users is considerable; the *d*-value in this zone is 13%.
- *General participation* is, as expected, most effective in the intensive action zone; the *d*-values are 53% and 2% for the intensive and extensive action zones respectively.
- *Traditional wealth* seems to be more important in the intensive than the extensive action zone. The corresponding *d*-values are 12% and 5%.
- *Outside contacts* are only of importance in the extensive action zone where the *d*-value obtained is 11%. In the intensive action zone the relationship is, at best, non-existent and could even be negative. The *d*-value is -4%.

In this region two variables, monetary wealth and outside contacts, are more important in the extensive action zone than in the intensive action zone because in both cases the *d*-values are larger for the former zone and the *p*-values associated with the χ^2 are very small. The land variable is of lesser importance, but may be said to be at least as important in this zone as in the intensive action zone.

Education and general participation are the only two variables which can be said to be important in the intensive action zone when applying both criteria. However, as the sample size of the intensive zone is fairly small, the relative values of the *d*'s will not be considered. It was then shown that the rural wealth indicators are also of importance, and so is mass media use. It seems that, when information about innovations is made available in a systematic way to the *comuneros* of this region, the potential wealth of a *comunero* plays a decisive role in his decision-making process regarding adoption of innovations.

The impact of the location of the *comunidad* in an intensive or extensive action zone is considerable. The differences between the non-relevant category in the intensive action zone and the relevant category in the extensive action zone range from -5 for mass media use and -1 for education, to 11 for general participation. Comparing the percentage of adopters in the relevant categories of the variables considered in the intensive action zone and the total region, the importance of this *comunidad* level variable is evident.

<i>Variable</i>	<i>Original relationship</i>				<i>Intensive action zone</i>				<i>Extensive action zone</i>			
	<i>Type of relationship</i>	<i>Value of 'd'</i>	<i>Relevant</i>	<i>Non-relevant</i>	<i>Type of relationship</i>	<i>Value of 'd'</i>	<i>Relevant</i>	<i>Non-relevant</i>	<i>Type of relationship</i>	<i>Value of 'd'</i>	<i>Relevant</i>	<i>Non-relevant</i>
Aspirations for children	positive	4	10	6	NO	0	21	21	positive	4	5	1
Modernism	positive	1	10	9	positive	2	22	20	positive	2	5	3

<i>Variable</i>	<i>Type of relationship</i>	<i>Value of 'd'</i>	<i>p</i> χ^2	<i>Tau</i>	<i>Type of relationship</i>	<i>Value of 'd'</i>	<i>p</i> χ^2	<i>Tau</i>	<i>Type of relationship</i>	<i>Value of 'd'</i>	<i>p</i> χ^2	<i>Tau</i>
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The attitudes considered are unrelated to adoption of innovations, even when controlling for the type of action zone in which the *comunidad* is located.

The importance of the *comunidad* level variables is evident.

Taking the degree of integration into the national society as an indicator of the availability of information, or of the opportunities open to the *comunero* in regard to existing information in the national society, the following results are obtained.

In both regions the variables education and general participation are those most strongly related to the adoption of innovations in the integrated *comunidades*. General participation includes, among other things, participation in informative sessions with state organisations involved in the development programmes. In these *comunidades* the influence of the wealth factor is negligible; the difference between the 'rich' and the 'poor' is only slight.

In those *comunidades* which, since the start of the project, have attained the level of integration reached in other communities by 1966, the important variables are those related to wealth and the availability of information through impersonal channels of communication. In the rural areas studied the monetary aspect of wealth is important in both regions.

In Andahuaylas, so-called rural wealth – possession of land and animals – which can be converted ultimately into monetary wealth, is also important.

In the Mantaro region these variables apparently have no importance, possibly because this region is already incorporated into the monetary market. As the percentage of adopters of the relevant categories of the variables considered in the high and the medium integration *comunidades* is nearly the same, the conclusion that those in the latter zone who have the necessary means to adopt the modern techniques adopt them more rapidly, is justified. Thus, although the Mantaro and Andahuaylas regions have completely different historical backgrounds, and the level of use of these techniques is different, the conclusions are basically the same.

There is one exception. In the Mantaro region – in accordance with its historical development – the participation in communal activities has a positive influence on the adoption of innovations, especially in the medium integration *comunidades*. This variable plays no role whatsoever in Andahuaylas.

When the impact of the location in an intensive or extensive action zone is assessed, it must be kept in mind that this refers to the availa-

bility of *comunero* directed information about new opportunities. However, the differential degree of development in the two regions plays a crucial role.

In the Mantaro region, in those *comunidades* located in the extensive action zone (i.e. where *comuneros* only have access to the diffuse information), the variables most strongly related to the adoption of modern techniques are the wealth indicators, especially monetary wealth, mass media use and participation in communal activities.

Information about the modern techniques has been available in a generalised and diffuse way and, given the relatively high degree of education of the *comuneros* in this region, these variables are sufficient to induce the *comuneros* to adopt the new techniques. Roughly speaking, in this zone money, information from the outside (through impersonal channels) and possibly the example and encouragement from fellow *comuneros* are sufficient to induce the *comunero* to use of the new techniques.

In the intensive action zone the variables most strongly related to the adoption of modern techniques are education, outside contact and general participation. Monetary wealth and mass media use are not as strongly related to the adoption of innovations as they are in the extensive action zone. There is some evidence that in the intensive action zone, availability of *comunero*-directed information and technical expertise has somehow tempered the influence of the wealth factors.

In the Andahuaylas region the variables strongest related to the adoption of innovations in the extensive action zone are monetary wealth, direct outside contact and, to a lesser degree, education. In *comunidades* of this relatively underdeveloped region of the country, where only diffuse knowledge about innovations is available, the *comunero* will use the modern techniques provided he is linked with the national society through education, and outside contact. Mass media use or more general impersonal communication channels play no role in these *comunidades*. In addition, as the *comunidad* tradition is alien to this region its influence is negligible.

In the intensive action zone in this region the variables most related to the adoption of innovations are education, mass media use, general participation, traditional wealth, and land. As in the Mantaro region, the variables education and general participation are of importance but, contrary to the situation in Mantaro, the rural wealth variables are relevant and the role of the monetary wealth variable is somewhat modified. Due to the availability of *comunero*-directed information it was possible for *comuneros*, apparently not yet fully incorporated into the

monetary market, to use the new techniques because of their traditional wealth and the amount of land they possessed. This clearly shows the intermingling existing between typical *comunidad* characteristics and national society characteristics in this region.

5.4. THE COMBINED INFLUENCE OF THE INDIVIDUAL AND COMUNIDAD LEVEL VARIABLES ON KNOWLEDGE ABOUT AND ADOPTION OF INNOVATIONS

In previous sections of this chapter it has been shown that both individual and *comunidad* level variables are related to knowledge about, and use of, the innovations presented. The *comunidad* level variables supplied the surroundings in which the introduction-diffusion process took place. The influence of these variables on the existing relationships between the initial variables and adoption of innovations was assessed in part 5.3.3. In order to gain some insight into the way these two types of variables act together to explain the variance of knowledge about and adoption of innovations, multiple regression analysis was performed using both individual level and *comunidad* level variables.

5.4.1. The combined effect of the individual and comunidad level variables on knowledge about innovations

In the Mantaro region two individual level variables, household wealth and mass media use, were related to knowledge about innovations and explained 50% of the knowledge about innovations. The three *comunidad* level variables independently explained 37.2% of the variance of knowledge. When allowed to interact, these five variables explained 58.9%, indicating that part of the influence of the individual level variables was accounted for by the *comunidad* level variables.

Considering these two types of variables independently, the individual level variables are of more importance than the *comunidad* level ones and as was shown on p. 169, the most important of the *comunidad* level variable was integration into the national society. Its explanatory value was highest when combined with the degree of internal integration of the *comunidad*.

In the Andahuaylas region the variables modernism and communal participation were related to knowledge about innovations, explaining 19.9% of its variance. The three *comunidad* level variables, when acting alone, account for 52.8% of the variance of knowledge in this region.

When allowed to act together these five variables account for 59.2% of the variance. These results clearly show that for this region the *comunidad* level variables are more important than the individual level variables. The variable of most importance in explaining the variance of knowledge about innovations is the type of action zone in which the *comunidad* is located. As shown on p. 170 this variable, together with the internal integration of the *comunidad*, explains a considerable amount of the variance.

The results in the two regions differ but are consistent with what was to be expected, given the historical development of the regions and their degree of development. In the Mantaro region the individual level variables are more important than the *comunidad* level variables, while the most important *comunidad* level variable was integration into the national society, especially when acting in combination with the internal integration of the *comunidad*. In the Andahuaylas region the *comunidad* level variables were more important than the individual level variables; however of the *comunidad* level variables type of action zone was most prominent, especially when combined with internal integration of the *comunidad*.

5.4.2. *The combined effect of the individual and comunidad level variables on adoption of innovations*

In the Mantaro region eight individual level variables – knowledge, modernism, aspirations for one's children, communal participation, mass media use, household wealth, monetary wealth and education – are related to the adoption of innovations, accounting for 69.7% of the variance. The three *comunidad* level variables explain 19.9% of the variance of adoption of innovations. Neither of the two main *comunidad* level variables seem to predominate over the other in relation to explanatory power. When individual and *comunidad* level variables are allowed to act together, 71.8% of the variance is explained. As in the case of knowledge about innovations, the *comunidad* level variables influence the adoption of innovations partly through the individual level variables.

In the Andahuaylas region the variables directly related to the adoption of innovations are: knowledge, land, general participation, mass media use, monetary wealth and education; they account for 9.5% of the variance of adoption of innovations. When acting alone, the *comunidad* level variables are capable of explaining 7.8%. None of the *comunidad* level variables were predominant. The amount of variance explained is 14.5% when the two types of variable act together.

The results clearly indicate that in the Mantaro region the individual level variables are more important than the *comunidad* level variables to explain the variance of adoption of innovations. This is in striking contrast with the situation in Andahuaylas, where the role of the *comunidad* level variables is considerable, although the total amount of variance explained is low.

As in the case of the knowledge about innovations, these results are consistent with what was to be expected, owing to the differential levels of development and distinct historical processes in the two regions.

5.5. A BRIEF APPRAISAL OF THE RESULTS

The aims of the present study were to locate the variables (both at the individual and *comunidad* level) responsible for the adoption of modern agricultural techniques in two highland regions of Peru which have been subjected to an intensive development programme.

Considering the processes initiated by the PNDIPC as a modernisation process, and considering the *comuneros* as a special type of peasant, the relevant literature was briefly reviewed to gain insight into the factors related to the modernisation processes and into the characteristics attributed to peasants in general. The factors generally associated with social change (modernisation processes) were isolated and their relevance to the situation in the two regions assessed. After the review of the peasants' characteristics, a short criticism was given on the so-called socio-cultural characteristics normally attributed to them. In order to obtain a more realistic picture of the peasants, it was proposed, as a general strategy, that the actual situational factors, as well as the historical experience of the people involved, should be considered. In this study a short description of the development of the Peruvian society is given, with special reference to the rural population.

Taking into account the relevant factors from social science literature dealing with social change in general, the introduction of innovations in particular, and the actual situation of the *comuneros* in the two regions studied, a simple model was proposed which would isolate the variables relevant to the adoption of innovations. The variables considered belonged to both the *comunidad* structure and the national society.

The Mantaro region is relatively well integrated into the national society, and the modern techniques which the PNDIPC claimed to have introduced in the rural areas were already in use before PNDIPC began in 1966. Eight interrelated variables are related to the use of these techni-

ques in this region. Consistent with the proposed model, they explain a considerable amount of the variance of adoption of modern techniques. One typical *comunidad* variable, participation in communal activities, was shown to be important in this region. This variable is of considerable importance in the explanation of the variance of the adoption of innovations and must be explained by the relevance the *comunidad*, as a social organisation, has had and still has in this region. This leads to the conclusion that, in regions where communal organisation is strong and still meaningful to the *comuneros*, it has a positive influence on the adoption of innovations, probably due to the personal inter-communication of those involved with communal affairs.

The other variables are education, household wealth, monetary wealth, mass media use, modernism and aspirations for one's children. Thus, the factors either directly or indirectly related to the use of modern techniques are, on the one hand, variables related to the structure of the national society, i.e. the non-rural sector of the Peruvian society, and, on the other hand, the variables modernism and aspirations for one's children. The direct influence of attitudes is considerable in this region.

It was shown that in this region, the variables land, land fragmentation and sharing are unrelated to the adoption of modern techniques, either as 'initial factor' or intermediate variable. In this region the block of variables considered as 'favourable conditions' are of no relevance.

Using integration into the national society as a measure of accessibility to information available in the national society, in *comunidades* integrated before 1966 general participation is shown to be related to the use of modern techniques. The general tendency in such a *comunidad* is that the influence of the wealth variables is reduced. This means that within these *comunidades*, the difference between the percentage of users of the innovations is less than in the region. In these *comunidades* the relationship between education and use of innovations is stronger than in the region.

In *comunidades* which became integrated during the period 1966-72, access to the information available in the national society has caused those *comuneros* who were better off to take advantage of new opportunities. These results seem to indicate that, in the first phase of the process of introducing new techniques in this region in a diffuse or indirect way, and when the decision-making in regard to their use is individual, those who are better off will profit most by the new opportunities. As the *comunidades* become more integrated into the national society the wealth variables seem to become less relevant, probably because the new techniques become more widely used and are accepted as normal routi-

nc. Whether the use of these modern techniques has a negative effect on the social structure, and especially on wealth distribution, will depend on a series of cultural factors such as the degree of individualisation within the *comunidad* and the existence of cultural elements which lead to redistribution of wealth, or at least avoid accumulation of wealth by a few. If these cultural elements are lacking due to the increasing influence of the national society which is basically individualistic, it is to be expected that there will be an increasing accumulation of wealth, increasing inequality, and also destruction of the communal organisation.

Using the variable type of action zone to distinguish between the *comunidades* which have received *comunero*-directed information about the innovations and those who have not, the following results are obtained. In *comunidades* located in the extensive action zone, the variables most related to the adoption of modern techniques are the same as those in the medium and low integration *comunidades*. Thus, in *comunidades* which only have access to information present in the national society, wealth variables are of considerable importance. In *comunidades* located in the intensive action zones, the influence of the wealth variables is reduced. Directed social action can, apparently, reduce the influence of the wealth variables, at least in this region. The presence of the change agents and their activities can induce *comuneros* with less monetary wealth to use the new techniques.

In the Andahuaylas region only 9% of the *comuneros* engaged in agriculture are using modern techniques which can be said to have been introduced by the state agencies involved in the PNDIPC. The individual level variables directly related to the adoption of innovations are knowledge, land, general participation, education, monetary wealth and mass media use. The proposed model is less applicable in explaining the adoption of innovations in this region. The variables 'modernism' and 'aspirations for one's children' are not directly related to the adoption of modern techniques. The initial factors are related to the use of innovations but are hardly at all related to knowledge about them. In this region the role of the state agencies involved has been of considerable importance but has not been accounted for in the model.

In this region, when analysing the relationship between the initial variables and the adoption of innovations in *comunidades* with a different degree of integration into the national society, the conclusions are the 'same' as in the Mantaro region. In highly integrated *comunidades* the influence of the wealth variables is only slight – that is, they are of less importance than in the medium integration *comunidades*. In these *comunidades* both monetary and non-monetary wealth are shown to be

strongly related to the adoption of innovations, confirming the conclusion that, when new opportunities are presented, people who are relatively better off will profit more. In this transitional region, which is partly incorporated into the market economy, the variables which refer to non-monetary wealth – which of course is convertible into monetary wealth – are apparently also important.

In Andahuaylas the effect of the type of action zone in which the *comunidad* is located is less clear than in the Mantaro region. The variables most related to the adoption of modern techniques in the extensive action zone are monetary wealth, outside contacts and, to a lesser degree, education. In the intensive action zones the results seem to indicate that the effect of monetary wealth is somewhat reduced, but that the traditional wealth variables seem to gain in importance. On the one hand the influence of *comunero*-directed actions acquainting them with new knowledge seems to reduce the influence of the wealth variable in its monetary form; on the other hand, however, it increases the use of modern techniques by people who possess non-monetary wealth. Thus in this region, which is not yet fully incorporated in the monetary economy, the actions of the state agencies have induced the *comuneros* (who are relatively well off by rural standards) to use modern techniques.

The model has been helpful in the search for relevant variables. It cannot account for the situations in both regions, but needs only a little modification for application in the Mantaro region; the only modification needed is the elimination of the block of 'favourable' conditions. In Mantaro the variables considered under this heading seem to be unimportant in the explanation of adoption of modern techniques. Thus the land variable in this region is neither an 'initial factor' nor a favourable condition.

In the Andahuaylas region the model is less applicable. Again the block of 'favourable' conditions must be disregarded. Land in this region is an indicator of rural wealth, and thus an initial factor. It also seems to be irrelevant here to deduce willingness to adopt innovations from the socio-cultural variables (in this case modernism and aspirations for one's children). Evidently in this region other variables should have been included in the model, such as contact with state officials, trust in the advice given and other variables related to the interaction between *comunero* and official, i.e. the change agent. However, the results obtained using the model in this region are relevant and the model has therefore proved useful.

The results obtained in both regions clearly show that, when *comunidades* become more integrated into the national society, the variables re-

lated to wealth (especially in its monetary form) are of importance for the adoption of modern techniques. In *comunidades* which have already reached a certain degree of integration into the national society, the influence of the monetary wealth variables is *reduced* but not eliminated.

If *comunero*-directed information is available, the influence of the monetary wealth variables is also reduced. In the transitional region (Andahuaylas) where *comuneros* are not yet incorporated into the monetary system, the availability of *comunero*-directed information is capable of inducing *comuneros* who are relatively well off by rural standards to use modern techniques. In both regions (i.e. transitional and relatively modern), therefore, wealth seems to be an important factor and has a positive influence on the use of modern techniques. Education is of the utmost importance to the adoption of modern techniques because it is related to most of the variables which have a positive effect on the adoption of innovations. This variable will probably be the most helpful in counter-balancing the importance of the wealth variables, provided that strategies not based on wealth are devised to enable the *comuneros* to use the modern techniques.

The role of the *comunidad* level variables differs in the two regions. With regard to knowledge about innovations, in Mantaro it was shown that the three *comunidad* level variables are of less importance than the individual level variables. The combination of integration into the national society and internal integration proved a better predictor than the combination of location in action zone and internal integration, whereas in Andahuaylas the situation is completely different. Firstly, in Andahuaylas the *comunidad* level variables are more important than the individual level variables and, secondly the combination of location in action zone and internal integration is a better predictor than the combination of integration into the national society and internal integration.

With regard to the use of innovations, in the Mantaro region the individual level variables are much more important than the *comunidad* level variables, whereas in Andahuaylas the *comunidad* level variables explain nearly as much of the variance as the individual level variables. In neither zone can the relative importance of the *comunidad* level variables and their combinations be assessed with justification due to the inconclusive results.

The different way the *comunidad* and individual level variables behave in the two regions, and the different combinations of *comunidad* variables that are of relevance in the case of knowledge about innovations, are in line with the historical experiences of the regions.

The two socio-psychological measures related with the use of innova-

tions present some interesting results in Andahuaylas. In the areas in which the state agencies were involved – the intensive action zone – being modern or having aspirations, has no relationship at all to the use of innovations. In other words, the non-modern *comuneros* seem to use the innovations to the same degree as the modern ones. Apparently this is due to the actions of the agencies involved in the PNDIPC. It can be tentatively stated that there are two processes of acceptance of innovations going on. The first is the well known process of individual decision-making which occurs if an individual possesses wealth, land and is modern. The other (not well documented) process occurs when the peasant – in spite of the fact that he is not modern in his outlook – uses the innovations made available to him through directed campaigns. It can be argued that in such cases the non-modern peasant will possibly accept the innovations because of his ‘traditionalism’; he uses the innovations because he is told to do so by the authorities. This last process poses a host of problems not yet studied. However, with a proper approach it might prove an alternative to the individualised approach.

NOTES

- 1 Rogers, E M. and Shoemaker, F F, *Communication of Innovations, a Cross-Cultural Approach*, New York, 1971 (2nd ed)
Havelock, R G, et al, *Planning for Innovation through Dissemination and Utilization of Knowledge*, Ann Arbor, 1973 (4th printing)
- 2 See e.g. Nuñez del Prado, O, ‘Aspects of Andean Native Life’, in Heath, D B, and Adams, R N (eds), *Contemporary Cultures and Societies in Latin America*, New York, 1965 pp 112-113
- 3 This is in accordance with the conventions used in the path-analysis, see e.g. Li, C C, ‘The Concept of Path-Coefficient and its Impact on Population Genetics’, in *Biometrics* Vol 12, 1956, pp 190-210
Nygren, G T, ‘Interactive Path-Analysis’, in *American Sociologist*, Vol 6, 1971, pp 37-43
- 4 Rogers, E M (with Svenning, L), *Modernization among Peasants, the Impact of Communication*, New York, 1969
- 5 Rogers and Shoemaker, *op cit*, and Havelock et al, *op cit*
- 6 Rogers and Shoemaker, *op cit*, especially pp 176-191
- 7 *Idem*, pp 176-191
- 8 *Idem*, pp 99-104 and 112-113
- 9 The expected percentage of innovation users in the category of those who had more than 1 ha of land and less than 6 plots was $7 + (-1) + 1 = 7$. The observed percentage is 28, hence the interaction effect is 21
- 10 See Galtung J, *Theory and Methods of Social Research*, London, 1967, pp 414-415

Appendix 1. The permanent project staff

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Researchers:	Ana Ponce Alegre Mario Torres Adrian Sandra Vallenias de Ugaz
Assistant Researchers:	Maria Fernandez Aurora Riva de Cruz Ramiro Samaniego Diaz Andres Soto Mena

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Mantaro

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Assistant Field Director:	Marco Ugarte Ochoa
Supervisors:	Juan Aliaga Juan Almeyda Almeyda Jesus Ramirez Tazza Fidel Rivas Nañez

Interviewers

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Hermalinda Cairo Martinez	José Marin Gonzalez
María Elsa Castilla Rojas	Graciela Moreano Marticorena
Yolanda Durand Arias	Manuel Ortíz Espinar
Cristina Garay Bernuy	Rosa Pachuaco Turin
Reynaldo Hidalgo Pasapera	Gloria Peralta Durand

Erasmus Ferrer Ruiz Dionisio
Esther Saravia Paucar
Mery Solis Maten
Eduardo Valenzuela Samaniego
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Sergio Gamarra Cisneros
Zócimo Granados Orihuela
Vladimiro Huaroc Portocarrero

Magdalena Inga
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Nelly E. Munnoz Cervantes
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Andahuaylas

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César Nuñez del Prado Aparcio
Julio Quispe Cáceres
Freddy Sánchez Davila

Policarpio Apaico Barrientos
Gustavo Castillo Ochoa
Isaac Delgado Villena
Gustavo Gomez-Gutierrez
Mario Gutierrez Palomino
Jorge Heredia D.
Ricardo Llosa Espinoza
Rosa-Luz Murillo Valdivia
Roberto Olivares Sulca
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Appendix 2. Methodological note

This methodological note serves two purposes:

- A. to report actual procedures used, and
- B. to justify procedures and techniques utilised.

The present study can be considered a secondary analysis because it is based on data obtained from a study which had its own aims and purposes. The design of the original study was that of an evaluation and consequently was not the most efficient design for the purposes of the present study.

THE ORIGINAL STUDY

The original study was to evaluate the consequences of some of the actions undertaken by state agencies involved in the PNDIPC. Basically the design used was that of a modified experimental study. In order to obtain information adequate for the evaluation of the effects of the actions, it was necessary to have two experimental groups, one which had been subjected to the actions of the PNDIPC, and a control group which had not been subjected to PNDIPC actions. In addition, two points in time were needed; the initial point was 1966, before the PNDIPC began its operations, and the second was the situation in 1972. Comparing the changes observed in the two groups, and correcting for initial differences between them, valid information could be obtained concerning changes which had taken place. In order to be able to attribute these changes to the actions of the state agencies involved, additional information, of a more qualitative nature, was needed as to which agencies (state and private), had been engaged in development activities during the period designated. Basically the following strategy was used: information about the actual changes was obtained by interviewing *comuneros* themselves, whereas background information was obtained from *comunidad* leaders and from the agencies involved in development projects in the region.

As adequate information concerning the situation in 1966 was not available, this information was obtained from the *comuneros* and *comunidad* leaders.

Given the type of information needed, it was decided to divide each ZAC into two sub-zones, one of 'intensive action' and another of 'extensive action', the latter acting as the control group. Within each sub-zone a multi-stage sample of *comuneros* was selected for interviewing. The first stage consisted of the *comunidades* located in a sub-zone, from which a certain number was selected with equal probability. From these selected *comunidades* the final sample of *comuneros* to be interviewed was chosen. The number of *comuneros* selected was either determined by the size of the *comunidad*, or was an arbitrary number unrelated to size. The samples thus obtained were multi-stage clustered epcem¹ samples, or multi-stage clustered non-epcem samples of the sub-zones of each ZAC.

Originally the division of the ZAC into two sub-zones was to be done in the following way: from each state agency involved with the PNDIPC a complete listing of actions realised in each *comunidad* of each ZAC from 1966 to 1972 was to be obtained. This information was to be pooled, thus providing a basis for selection of the *comunidad* sample.

It was found, however, that the information needed was not readily available and its collection would have taken a considerable amount of time, and an alternative procedure was therefore used. The zonal representative of the ONDC was asked to divide his ZAC in two zones, based on information he could obtain from the state agencies involved and on his knowledge of the ZAC. Once this zonification was made the procedure described above was followed.

The population to be covered by the evaluation study was that *comunero* population living in the ZAC's which could have been subjected to actions of the PNDIPC. The actions developed by the PNDIPC included a wide range of activities, but for the purposes of the study those related to the agricultural undertakings of *comuneros*, schooling facilities, and public health were considered most relevant. It was decided that the unit of analysis would be the household, and consequently that the persons to be interviewed would be male household heads not over 60 years of age. Male household heads were selected because it was expected that they would be more accessible and could furnish more information than females, and that the small number of female household heads would only complicate the analysis. The age limit of 60 years was introduced because it was known that younger *comuneros* were participating more than older ones in development projects. Furthermore, given

the low life expectancy in the Sierra region, a limited number of male household heads over 60 would be found; lastly, it was expected that older people, given their low level of education, might have more problems with the interview. These restrictions were made in order to obtain the most useful information possible and to facilitate fieldwork.

The number of *comuneros* to be sampled in each sub-zone of each ZAC was determined by practical rather than by theoretical considerations. Given the budget, the staff available, the time limits set by the contract, the relative inaccessibility of the regions and the number of vehicles available, the total number of *comuneros* to be interviewed was set at approximately 200 per sub-zone. Given the fact that the same respondents would be used to obtain information regarding the situations in both 1966 and 1972, it was expected that the high correlation would permit a relatively small standard error, and thus justify the small samples. In addition, given that the changes expected would be relatively large (10 to 20% or more) and that the percentage of people using the elements or having the relevant characteristics would be low, a relatively small sample would be sufficient for the purposes of evaluation. More detailed information will be provided later concerning the samples used for the two regions considered in the present study.

As can be seen from Appendix 1, a complete field office was operating in each ZAC. The general responsibility for the execution of fieldwork rested on the field-director and his/her assistant. Interviewers were recruited locally after initial screening, a comparative examination and interview training. All had a working knowledge of the local languages or dialects, were mainly students or graduates of the social science departments of local universities, or Schools for Social Work, and had some previous experience in the application of structured interviews. The interviewers were divided into groups of six to eight persons under a supervisor. The supervisors were mainly graduates of the social science department of the Pontificia Universidad Católica del Perú, who had worked with the project director on previous projects, or were from other universities or state agencies with extensive experience in the application of survey interviews. They all had a basic knowledge of sampling procedures.

The sample of *comuneros* was selected by the field director at the headquarters of the ONDC in each ZAC. In cases in which no list was available, the procedure was to construct, with the help of *comunidad* authorities, the most complete list possible of household heads, from which the desired number of *comuneros* would be selected.

A target sample had been determined for each *comunidad*. In order

to obtain this number the following procedure was used. An original sample, twice the size of the target sample, was selected. One half was considered the main sample, and the other the reserve pool. This procedure was necessary because even though the most recent and complete lists of *comuneros* were used, they were approximately a year old and some modifications and changes could be expected. Those people who could not be considered belonging to the target population were excluded at the time of interview. These included:

- A. people who had migrated;
- B. female household heads;
- C. deceased or unknown persons;
- D. *comuneros* too old to be interviewed.

In addition, there were people belonging to the target population but who could not be interviewed either because they were not at home or because they refused to co-operate. This latter category was found to be almost non-existent.

The substitution of those belonging to the first groups presents no problem as they can be considered out of the target population, while substitution of the people from the second group presents some problems for they do belong to the population and therefore must be interviewed. These non-coverage errors cannot be corrected by statistical techniques. What happens in this case is that the sample represents only part of the target population. Given the relatively short period of time available to do the fieldwork, this inconvenience was accepted and people who were not at home were substituted for. When calculating the weight factors for each *comunidad* a correction was made to minimise the effects of this procedure.

The interviews were checked at least twice, first in the field by the supervisor and later in the field office by the field-director and assistant field-director. If omissions or serious mistakes were detected the interviewer returned to the *comunero* to correct his mistakes. In such cases the field supervisor made an extra check to ensure that the interviewer had really contacted the *comunero* and corrected the mistakes. Due to this double control, the fact that the questionnaire was relatively simple, and also to the dedication of the interviewers, the quality of the information obtained was high.

The fact that some of the *comuneros* had to be interviewed in local unwritten languages caused some problems. The questionnaires were written in the Spanish language and during interview training a standardisation was obtained, by mutual agreement, as to the wording in the local dialects. Special reference must be made to the items used to measure

attitudes of *comuneros*. The measurement of attitudes is extremely difficult in rural areas because the researcher must be assured that his questions are of relevance for the respondents. The project director and some members of the permanent staff have been engaged in research projects in the Peruvian rural areas since 1969 and have had experience with attitude scales. The conclusions from these partial studies were that:

- A. the wording must be as simple and straightforward as possible;
- B. the response categories must be as simple as possible, suggesting the use of dichotomies.

Based on this experience the indicators that functioned best in past projects were included in the questionnaire, modifying the wording when necessary. Attitudes included were those referring to fatalism, familism, faith in other *comuneros* and localism. It was decided to measure the faith in other *comuneros* and *not* faith in the (generalised) others because, given the interview situation this could lead to inexact or invalid answers due to the courtesy of rural people toward strangers. With regard to the localism attitude, it was found in previous research projects that none of the cosmopolitanism scales² normally used, were adequate for the peasants interviewed. An alternative was therefore chosen which was to devise an index containing items relevant to *comuneros*. Two items were used: the generalised tendency to consider leaving the *comunidad* – something a large number of *comuneros* had already done – and a more specific question about their willingness to migrate to the jungle area if enough land were to be provided.

The original study was completed successfully and the results have been published in a client report: *Comunidades Campesinas, Informe Técnico Evaluativo de las Acciones del Proyecto Nacional de Desarrollo e Integración de la Población Campesina*, Lima, 1972.

THE PRESENT STUDY

Even though the present study uses part of the data obtained, its design is basically different from that of the original study. While the original study was the comparison of two sub-groups at two different times, this is a cross-sectional study. This implies that in each of the two ZAC's studied the samples of the sub-zones have to be combined to describe the situation of the ZAC as a whole. This complicates even more the structure of the samples. The sample for the ZAC as a whole can be described as stratified multi-stage clustered samples with unequal prob-

abilities. This implies that, besides the corrections made to obtain equal probabilities of selection for all *comuneros* sampled in each sub-zone, additional corrections had to be made to ensure equal probabilities of selection for the entire ZAC.

The actual sampling procedures in each of the two regions studied will be presented here, followed by a report on weighting procedures, and the consequences of the use of this type of sample, with special reference to estimates of standard error.

The samples

In the Mantaro region, officials of the ONDC distinguished one sub-zone of extensive action and four sub-zones of intensive action. For each of these sub-zones the number of *comunidades*, and an estimate of the number of households, could be obtained. Information was available about all the *comunidades* in this region, and adequate listings existed of nearly all of the *comunidades*. It should have been possible then to obtain an efficient sample design. However, due to the lack of vehicles combined with the limited time available another design was chosen, thereby sacrificing efficiency.³ The procedure followed was equal probability selection of *comunidades* within each sub-zone, and unequal probability selection of *comuneros* within each *comunidad*.

Table 1. General information about the sample in Mantaro

	<i>Intensive action zones</i>				<i>Extensive action zone</i>	<i>Total</i>
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>		
Estimated number of household heads	3,263	8,336	9,051	5,183	27,947	53,780
Number of <i>comunidades</i>	23	28	39	27	116	233
Number of <i>comunidades</i> selected	10	10	16	10	20	66
Estimated number of household heads in selected <i>comunidades</i>	1,157	3,208	3,252	2,195	5,759	16,571
Number of household heads interviewed	50	50	96	50	197	443
Sampling fraction of the first stage	0.43	0.36	0.41	0.37	0.17	0.28
Sampling fraction of the second stage	0.043	0.016	0.030	0.023	0.029	0.027

This design requires weighting from the start. The process of weighting was complicated by three factors: the wish to correct for the fact that the population was reduced by those not properly belonging to the target population; the need to correct for the non-response population; and the need to correct in order to obtain equal probabilities of selection for the total sample.

The weight factors were determined in such a way that the total number of respondents in the sample, when weighted, was equal to the actual number of respondents. Thus, the sum of the weights equalled the number of respondents obtained.

In Table 2 disaggregated information is supplied for the sample, using the following notation:

- N – the estimated number of households in the *comunidad*;
- n – the obtained sample in the *comunidad*;
- m – the obtained sample per *comunidad* plus non-response in the *comunidad*;
- k – the total number of respondents used (that is, m + the number of non-population *comuneros* encountered in the sample);
- A_i – the total number of *comunidades* in the sub-zone;
- a_i – the number of *comunidades* selected in the sub-zone.

The formula used to determine the weight per *comunero* was:

$$W_{hij} = \frac{m}{n} \times \frac{N}{k} \times \frac{A_i}{a_i} \times C,$$

where C is a constant, ensuring that the sum of individual weights is equal to the empirical number of respondents obtained, and where W_{hij} refers to the weight of the j -th *comunero*, of the i -th *comunidad* in the h -th sub-zone or stratum.

In the Andahuaylas region officials of the ONDC distinguished three sub-zones: an intensive action zone, an extensive action zone (where they had been engaged in a limited number of projects), and a non-action zone (where they had not operated at all). Unlike the Mantaro region, there were no precise data readily available for the number of *comunidades* per sub-zone, nor for the number of households per *comunidad*. Thanks to efficient support from the agencies involved, it was possible to obtain an estimate of *comunidades* per sub-zone, but it was impossible to obtain, in the time available, a reliable estimate of the number of households per *comunidad*. The following procedure was therefore used because it seemed to be the only valid one, given the

Table 2. Detailed information about the sample in Mantaro

Comunidad	N	n	m	k	$W_{h,j}$	Comunidad	N	n	m	k	$W_{h,j}$
A_1	242	5	8	9	1.6	D_1	179	5	5	12	0.7
A_2	39	5	7	15	0.1	D_2	42	5	6	11	0.2
A_3	60	5	5	8	0.3	D_3	311	5	6	9	1.9
A_4	371	5	7	8	2.5	D_4	39	5	5	8	0.2
A_5	40	5	7	13	0.2	D_5	689	5	5	9	3.0
A_6	90	5	6	10	0.4	D_6	94	5	5	13	0.3
A_7	66	5	7	9	0.4	D_7	387	5	6	8	2.6
A_8	115	5	6	9	0.6	D_8	178	5	7	8	1.4
A_9	70	5	6	8	0.4	D_9	176	5	5	8	1.0
A_{10}	64	5	6	8	0.4	D_{10}	100	5	7	8	0.9
B_1	93	5	5	11	0.4	E_1	386	10	14	20	1.1
B_2	293	5	5	6	2.3	E_2	320	10	13	17	1.0
B_3	117	5	5	12	0.4	E_3	109	10	10	10	0.5
B_4	970	5	5	10	3.6	E_4	243	10	11	26	0.4
B_5	279	5	5	9	1.4	E_5	202	10	13	20	0.6
B_6	381	5	5	10	1.8	E_6	795	10	11	15	2.5
B_7	76	5	6	8	0.5	E_7	45	10	12	21	0.1
B_8	309	5	6	13	1.1	E_8	138	10	12	17	0.4
B_9	315	5	6	11	1.3	E_9	347	10	15	23	1.0
B_{10}	429	5	5	9	2.3	E_{10}	82	10	14	25	0.2
C_1	181	6	8	16	0.5	E_{11}	232	10	11	18	0.6
C_2	244	6	6	8	1.0	E_{12}	304	10	12	16	1.0
C_3	424	6	7	10	1.6	E_{13}	420	7	12	17	2.6
C_4	97	6	6	9	0.4	E_{14}	198	10	13	13	0.8
C_5	149	6	6	8	0.6	E_{15}	137	10	13	17	0.4
C_6	37	6	6	10	0.1	E_{16}	144	10	14	16	0.5
C_7	208	6	6	7	1.0	E_{17}	588	10	13	20	0.8
C_8	198	6	7	7	1.0	E_{18}	142	10	13	16	0.5
C_9	115	6	9	15	0.3	E_{19}	98	9	12	17	0.3
C_{10}	115	6	6	10	0.4	E_{20}	1,809	9	12	17	5.4
C_{11}	149	6	9	9	0.8						
C_{12}	132	6	6	14	0.3						
C_{13}	230	6	7	16	0.6						
C_{14}	318	6	7	10	1.3						
C_{15}	595	6	6	9	2.2						
C_{16}	60	6	7	11	2.2						

circumstances. From each sub-zone a number of *comunidades* was selected with equal probability. In the intensive action zone only 13 *comunidades* were involved; all of them were included in the sample. For the selected *comunidades* an intensive search was made to obtain the most reliable information concerning the number of households, and also the most complete and recent lists of *comuneros*. These attempts were only partially successful, and for most *comunidades* the listing had to be done in the *comunidad* itself, either by updating existing lists or by constructing new ones. Given these problems it was decided to select with unequal probability within the *comunidades*. The number of interviews to be realised in each *comunidad* then was determined without reference to the number of household heads.

Table 3. General information about the sample in Andahuaylas

	Types of action zones			Total
	Intensive	Extensive	No action	
Estimated number of household heads	*	*	*	*
Number of <i>comunidades</i>	13	33	66	112
Number of <i>comunidades</i> selected	12**	10	6	28
Estimated number of household heads in selected <i>comunidades</i>	6,515	1,991	880	9,386
Number of household heads interviewed	141	88	90	319
Sampling fraction of the first stage	1.00**	0.30	0.09	0.25
Sampling fraction of the second stage	0.022	0.044	0.102	0.034

* No information available.

** In one of the *comunidades* the *comuneros* refused to co-operate.

The weighting procedure used in this region was the same as in the Mantaro region because both designs were found to be identical, although for different reasons. In both cases disproportionate stratified multi-stage clustered samples with unequal probabilities were used.

It is a well known fact that each sampling design has its own formula for estimating the variance of whatever statistic the researcher wants to use. Unfortunately, nearly all statistics of interest to social scientists are

Table 4. Detailed information about the sample in Andahuaylas

Comu- nidad	N	n	m	k	W_{hij}	Comu- nidad	N	n	m	k	W_{hij}
A_1	1,283	24	46	56	0.4	B_1	110	9	17	21	0.8
A_2	154	7	13	21	0.4	B_2	166	9	17	23	1.1
A_3	55	7	9	20	0.1	B_3	263	8	22	27	2.4
A_4	229	7	10	12	0.9	B_4	396	9	10	20	1.8
A_5	489	4	14	21	4.7	B_5	220	9	11	14	1.5
A_6	217	7	10	12	0.8	B_{11}	279	9	10	12	2.0
A_7	220	7	8	11	0.8	B_7	128	8	10	26	0.5
A_8	398	7	9	15	1.1	B_8	243	9	10	11	1.9
A_9	507	7	13	16	2.0	B_R	157	9	12	15	1.1
A_{10}	333	7	16	20	1.3	B_{10}	29	9	11	16	0.2
A_{11}	2,500	50	57	59	0.2						
A_{12}	130	7	13	21	0.4						
C_1	78	15	18	33	0.4						
C_2	48	14	14	16	0.5						
C_3	177	15	19	30	1.2						
C_4	249	15	23	33	1.8						
C_5	122	15	18	21	1.1						
C_6	206	15	22	22	2.1						

based on a series of assumptions that do not hold true in most sampling design. Special reference is made here to the fact that most sampling distributions are based on the assumption of unrestricted sampling. When this does not apply, the sampling distribution of the statistic must either be recalculated or corrected. Unfortunately most social scientists are either unaware of this or prefer the 'ostrich' technique. However, when using a complex sampling design as in this study, one cannot use 'normal' significance levels for any or all statistics.

In this study a complex sampling design was used, complicated by the several factors mentioned above. Given that weighting was used, the design became still more inefficient when compared to unrestricted sample design. Leslie Kish⁴ has proposed a relatively simple index, called the Design effect or Deff, to measure the inefficiency of a design as compared to an unrestricted design. Deff is defined as the ratio between the variance computed according to the correct formula of the design and the variance computed as if the design were unrestricted. The greater this index (i.e. the higher it goes above 1) the more inefficient the design. On the other hand, if the value of Deff is less than 1, the design used is more efficient than the unrestricted design. The consequences

Table 5. The values for p , $Deff$ and \sqrt{Deff} for a selection of dichotomised variables, Mantaro and Andahuaylas

Variables	Category	Mantaro			Andahuaylas		
		p	$Deff$	\sqrt{Deff}	p	$Deff$	\sqrt{Deff}
<i>Socio-economic variables</i>							
Education	Primary school	.40	3.350	1.86	.15	2.598	1.61
Land	Up to 1 ha	.65	3.800	1.95	.79	1.691	1.30
Number of plots	Up to 5 plots	.52	1.813	1.35	.78	4.967	2.23
Sharing	Does not share	.80	1.206	1.10	.94	1.621	1.27
Agricultural status	Primary	.47	1.793	1.34	.80	1.533	1.24
Monetary wealth	Rich	.56	2.267	1.51	.19	2.517	1.59
Traditional wealth	Poor	.72	3.549	1.88	.62	2.520	1.59
Household wealth	Rich	.43	3.076	1.75	.04	1.747	1.32
Age	Up to 40 years	.38	2.509	1.59	.51	1.675	1.29
<i>Behavioural variables</i>							
Outside contact	Travelled	.28	3.900	1.98	.21	1.973	1.39
General participation	High	.18	4.664	2.16	.09	1.111	1.05
Mass media use	High	.60	2.019	1.42	.20	3.262	1.81
Participation in communal activities	High	.22	4.369	2.09	.31	5.797	2.41
Adoption of innovations	Uses innovations	.60	5.010	2.24	.09	2.748	1.66
<i>Attitudes and knowledge</i>							
Aspirations for children	High	.69	1.395	1.19	.75	1.949	1.39
Modernism	Modern	.58	1.223	1.11	.45	1.377	1.17
Fatalism	Fatalist	.45	1.892	1.38	.47	2.078	1.44
Familism	Familist	.50	2.026	1.42	.52	1.250	1.12
Localism	Localist	.44	1.935	1.39	.69	1.997	1.41
Knowledge about innovations	Knows	.94	3.740	1.93	.87	2.755	1.66
<i>Comunidad-related variables</i>							
Type of action zone	Intensive	.56	15.810	3.98	.30	13.272	3.64
Internal integration	High	.35	17.487	4.18	.35	14.308	3.78
Integration into the national society	High	.63	16.866	4.10	.24	12.572	3.55

are clear. When one has an inefficient design and uses the 'normal' formula to estimate the variance of a statistic, under-estimation occurs. On the other hand, when the design is more efficient than the unrestricted one the actual variance will be over-estimated. Evidently $Deff$ varies with the sub-group of the sample one is analysing. Thus $Deff$ is, or can be, different for different variables, for their combinations, and for different sub-groups of the sample.

In order to give an idea of the efficiency of the design used in this study, $Deff$ was calculated for the sub-group of *comuneros* engaged in agriculture, in relation to 23 selected dichotomised variables. The form of dichotomies was chosen because it facilitated the calculation of $Deff$, and because many of the variables in the study were used in dichotomous form. Four groups of variables were considered: socio-economic variables, behavioural variables, attitudes and knowledge, and *comunidad*-related variables.

As can be seen from Table 5 the value of $Deff$ for the individual level variables fluctuates between 1.206 and 5.010. Consequently the values for \sqrt{Deff} in the Mantaro region fluctuate between 1.10 and 2.24. The mean value of $Deff$ is 1.63, and this means that the effective sample size of the sub-class used is $427/1.63$ which gives 262. Due to the sample design used the same standard error would be obtained if an unrestricted sample of 262 was used.

For the Andahuaylas region the fluctuation of \sqrt{Deff} is from 1.05 to 2.41, while the mean value is 1.49. Consequently the effective sample size for the regional sub-class is 204.

The *comunidad* level variables have very high values for the $Deff$, and hence \sqrt{Deff} . This is hardly surprising because the sample was designed to measure individual characteristics and not to measure *comunidad* level characteristics. Where a *comunidad* level variable as such is considered (chapter 4, part 4), the *comunidad* has been used as unit of analysis. Consequently the weight factors used were appropriate. When using the *comunidad* level variables as individual variables, the ineffectiveness of the sample design is larger than when the individual level variables themselves are used.

The criteria used to 'test' the results and the format of the tables

The complexity of the samples has an effect on the use of significance tests for any statistic used. Unfortunately, no straightforward rules are available for correcting the estimates of the variance of the statistics involved.

Owing to the complexity of the samples and their relative ineffectiveness it was decided to use the simplest analysis and statistical techniques available. Tau_b will be used to measure the relationship of variables. The exact sampling distribution for this statistic is unknown, even for unrestricted samples, but it has been shown⁵ that the maximum value of the standard error of this correlation index can be estimated by $2/n$.

To ascertain the validity of the indices constructed, the elementary linkage analysis developed by McQuitty⁶ was used. In this study the indices used are sum-indices and they represent the measured characteristics as ordinal scales.

In the analysis cross-tabulation technique, or multivariate analysis (as formalised by Lazarsfeld et al.) is used.⁷ Chi-square will be used to measure the significance of the differences between sub-classes. There is no simple way of correcting the sampling distribution of this statistic because of the complexity of the sample design; two sets of criteria have therefore been developed. The first are called strict criteria because they indicate strong relationships between variables.

The criteria used were a Chi-square associated with a p -value of at least .01 and a value of Tau_b at least twice the value of the maximum standard error as estimated by the Kendall formula. The second, the less strict criteria, were developed to allow for inclusion in the analysis of the relationships that seemed to be of relevance, although they did not meet the standards set by the strict criteria. These weaker criteria were a Chi-square associated with a p -value of at least .05 and a Tau_b of at least the same value as the maximum standard error. These criteria were set without the application of statistical theory, therefore no reference will be made to statistical 'significance' in the text. Instead, the term 'relevance' will be used to characterise a relationship that satisfies the conditions set by the criteria.

In Chapter 4 the tables presented are relatively simple. However, special formats were used to make optimal use of the space available. In the case of dichotomies, only one category is presented. When variables with more than two categories are presented, all categories are displayed.

In cross-tabulations of two variables the percentages are calculated vertically, i.e. the bottom row represents 100%. As is obvious from the table, the bottom row gives the relative size of each category of the 'independent' variable. For instance, in Table 4 the bottom row of the Andahuaylas table shows that 27% of the *comuneros* (318) belong to the 18-30 age group, etc. This format is followed throughout the chapter.

In correlation matrices, two special features must be considered. In

the first place, as the matrices are symmetrical only one half of the matrix is presented. Generally, the upper half of the matrix gives the data on the Mantaro region while the lower half presents the Andahuaylas data. If a correlation matrix is presented, and the distribution of the relevant categories of the correlated variables has not previously been given, then the percentages of these categories are shown in the first row for the Mantaro region, and in the first column for the Andahuaylas region.

The results of the analysis are given in Chapter 5. As already mentioned, sub-group analysis or sociological multivariate analysis was used. The use of Chi-square to evaluate the relevance of the relationships presents some problems. As is well known, the value of Chi-square is related to the sample size. In other words, if the same differences exist between the independent variables and some dependent variable, and if the sample size is doubled, then the value of the Chi-square will also be twice as large. The implications of this characteristics of Chi-square are of relevance in the introduction of test variables into the analysis of a given relationship between two variables.

The introduction of the test variables creates sub-groups and when the original relationship between the two variables is analysed per sub-group, because of the reduced sample size the value of the Chi-square may be less than the criterion value – even though the difference is the same in the sub-group as in the total sample.

The consequences are clear. The relationship between two variables can be stronger in a sub-group than in the total sample but, due to the reduced size of the sub-group, the researcher will fail to recognise this when applying strict statistical criteria. In order to correct this inconsistency an additional measure was used in Chapter 5, the '*d*' (difference) between the percentages of the dependent variable in the extreme categories of the independent variable. This measure is only applicable in monotonic functions. In the relevant tables in Chapter 5, therefore, the 'ideal' form of the function describing the relationship between the variables is also presented.

The following convention is used:

- NO is used to indicate that there is no relationship between the two variables considered.
- 'Positive' refers to a positive monotonic function.
- 'Negative' refers to a negative monotonic function. The simplest of these monotonic functions is the linear function.
- 'A-shaped' refers to a positive quadratic function.
- 'U-shaped' refers to a negative quadratic function.

- 'Irregular' describes a situation where no clear simple relation emerges, i.e. the function describing the relationship will be more complex than a quadratic function.

In order to facilitate reading tables in Chapter 5, the content of each type is described below.

Tables 1-15 have the same structure. Each row or line gives the results of the relevant category of that variable (considered a dependent variable) against the independent variable presented at the top of the table. The columns give:

- the name of the variable,
- the relevant category,
- the values of the dependent variable according to the categories of the independent variable,
- the p -value associated with Chi-square,
- the value of Tau_b .

Tables 16-19 have the same structure. In these tables the dependent variable is shown at the top of the table and each line or row presents the relevant data for each of the independent variables. The columns give:

- the name of the variable,
- the number of categories in the variable,
- the shape of the relationship between the two variables,
- the value of ' d ',
- the p -value associated with Chi-square,
- the value of Tau_b .

Tables 1-19 summarize the relationship between two variables.

Tables 20 and 25-32 have the same structure. They consist of two sets of tables and present the results of a tri-dimensional table. The dependent variable is indicated in the title of the table and each row or line represents the data of an independent variable. The first block of four columns describes the original relationship. Then follows a number of blocks describing the relationship between the original variables in the sub-groups created by the test-variable. The information given is:

- the type of relationship that exists between the two variables,
- the value of ' d ',
- the incidence of the dependent variable in the relevant category,
- the incidence of the dependent variable in the non-relevant category.

Another set of blocks gives additional information about the related variables. In addition to the type of relationship and the value of 'd', the following data are presented:

- the *p*-value associated with Chi-square,
- the value of Tau_b.

Tables 21-24 are straightforward and self-explanatory.

A path analysis presents simultaneously the relationship between the variables. It must be stressed, however, that the analysis in Chapter 5 is not a path analysis, even though the multiple regression technique is used.

In order to evaluate the simultaneous influence of all the relevant variables on the dependent variables, the use of parametric techniques was inevitable. The variables were used in their dichotomised form.

The coefficients used are product-moment correlations, as zero order, partial, multiple and multi-partial correlation coefficients – and the standardised regression coefficient, the beta coefficient. These parametric techniques were used in addition to the sub-group analysis and only to corroborate the conclusions reached with non-parametric analysis. Additionally, the parametric techniques were used to obtain some quantitative indication of the variance explained by the independent and intermediate variables.

NOTES

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2. Kahl, J.A., *The Measurement of Modernism: a Study of Values in Brazil and Mexico*, Austin, 1968, pp. 27-38.
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3. Kish, *op. cit.*, pp. 23-26.
4. *Idem*, pp. 88, 161-164 and 257-263.
5. Kendall, M.G., *Rank Correlation Methods*, London, 1948, pp. 49-65.
6. McQuitty, L.L., 'Elementary Linkage Analysis for Isolating Orthogonal and Oblique Types and Typal Relevancies', in: *Educational and Psychological Measurement*, Vol. 17, 1957, pp. 207-229.
7. Lazarsfeld, P.F., 'Interpretation of Statistical Relations as a Research Operation', in: Lazarsfeld, P.F., and Rosenberg, M. (eds.), *The Language of Social Research*, Glencoe, Ill., 1955, pp. 115-125.
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Appendix 3. List of abbreviations

In this appendix a list of the abbreviations used in the text are given. For each abbreviation the Spanish name is given, with the English equivalent in brackets.

BID	Banco Inter-Americano de Desarrollo (Inter-American Development Bank (IDB))
CNDC	Consejo Nacional de Desarrollo Comunal (National Community Development Council)
COOPOP	Cooperación Popular (Popular Cooperation Movement)
DGC	Dirección General de Comunidades (Directorate General of Comunidades)
IIP	Instituto Indigenista Peruano (Peruvian Institute of Native Affairs)
INCOOP	Instituto Nacional de Cooperativas (National Institute of Cooperatives)
MEP	Ministerio de Educación Pública (Ministry of Education)
MSP	Ministerio de Salud Pública (Ministry of Health)
ONDC	Oficina Nacional de Desarrollo Comunal (National Office for Community Development)
ONRA	Oficina Nacional de Reforma Agraria (National Office for Land Reform)
PNDIPC	Proyecto Nacional de Desarrollo e Integración de la Población Campesina (National Project for Development and Integration of the Rural Population)
SIPA	Servicio de Investigación y Promoción Agropecuaria (Research and Promotion Service for Agriculture)
ZAC	Zona de Acción Conjunta (Joint Action Zone)

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Samenvatting

Deze studie is gebaseerd op gegevens die verzameld zijn in 1972, als onderdeel van een evaluatiestudie van een ontwikkelingsproject in zes gebieden van de Peruviaanse hooglanden.

De rurale, hoofdzakelijk Indiaanse, bevolking van Peru is lange tijd verwaarloosd door de diverse nationale regeringen. Hun sociaal-economische en culturele situatie was slecht: ondervoeding, analfabetisme, al of niet verkapte werkloosheid en slechte hygiënische omstandigheden waren frequent. Aangezien de meerderheid van deze bevolking analfabeet was, was deelname aan het normale politieke leven van de natie uitgesloten en waren ze ook bij de overige aspecten van het nationale gebeuren slechts marginaal betrokken. Hun lage ontwikkelingspeil maakte uitbuiting door de overige sectoren van de Peruviaanse maatschappij, in dit geval vooral grootgrondbezitters en (tussen)handelaren, mogelijk en gemakkelijk.

De mensen in kwestie leven in min of meer zelfstandige dorpsgemeenschappen (*comunidades*), die als zodanig door de Peruviaanse wetgever erkend zijn als ze voldoen aan bepaalde, wettelijk vastgestelde vereisten, gebaseerd op sociale, culturele en historische kenmerken.

De leden van dergelijke dorpsgemeenschappen noemt men *comuneros*; het zijn hoofdzakelijk kleine zelfstandige boeren.

In 1964 besloot de toenmalige Peruviaanse regering een ontwikkelingsproject uit te voeren, met financiële en technische bijstand van de Inter-Amerikaanse ontwikkelingsbank, dat ten doel had de levensomstandigheden van de *comuneros* in zeven geselecteerde gebieden van de hooglanden te verbeteren. Verhoging van de produktiviteit in de landbouw was één van de belangrijkste componenten van dit project. Dit dacht men te bereiken door rasverbetering van de traditionele gewassen: mais en aardappelen, en door insecticiden en kunstmest. Men beoogde verbetering van de levensstandaard van de *comuneros* te bereiken zonder de structuur van de maatschappij op ingrijpende wijze aan te tasten,

d.w.z. de bedoeling was modernisatie van de maatschappij, geen fundamentele structuurverandering.

De onderhavige studie beoogt voor twee van de in het project betrokken gebieden na te gaan, welke sociale factoren een rol hebben gespeeld bij het accepteren en gebruiken van de moderne landbouwtechnieken.

De twee gekozen gebieden, de Mantaro-vallei en de provincie Andahuaylas, hebben een soortgelijke ecologie, maar hebben een geheel verschillende historische ontwikkeling doorgemaakt; bijgevolg is ook hun niveau van ontwikkeling verschillend.

De Mantaro-vallei heeft sinds de verovering van Peru door de Spanjaarden een rol gespeeld in het nationale leven. De *comuneros* spreken hoofdzakelijk Spaans en zijn reeds geruime tijd opgenomen in de monetair economie.

De bewoners van Andahuaylas daarentegen zijn lange tijd geïsoleerd geweest van het nationale gebeuren vanwege het feit dat tot de jaren dertig de grootgrondbezitters een overheersende positie in die streek innamen. De *comuneros* spreken hoofdzakelijk Quechua en zijn pas recent in de monetaire economie opgenomen.

Met het oog op het onderwerp van deze studie, de acceptatie van innovaties door *comuneros*, wordt eerst nagegaan wat er in de literatuur gezegd wordt over de eigenschappen van de 'peasants' (aangezien de *comuneros* een bepaald soort 'peasants' zijn), over sociale verandering en de verschillende modellen die gebruikt worden om de acceptatie van innovaties te verklaren. De 'peasants' wordt een aantal karakteristieken toegeschreven die een incompleet, inconsistent en welhaast karikaturaal beeld van hen geven. Dit is te wijten aan het feit dat er geen rekening wordt gehouden met de specifieke historische en maatschappelijke situatie van de 'peasant'.

Het accepteren van innovaties kan beschouwd worden als een bepaald proces van sociale verandering. In de literatuur wordt een drietal verschillende modellen onderscheiden, die bruikbaar zijn voor het bestuderen en analyseren van de acceptatie van innovaties. Na een kort overzicht van elk van deze modellen wordt gekozen voor het sociale interactiemodel als uitgangspunt voor de studie. Het model wordt enigszins gewijzigd om het toepasbaar te doen zijn op de Peruviaanse rurale samenleving.

Er wordt een kort historisch overzicht gegeven van de ontwikkeling van de rurale sector van Peru, in het bijzonder van de twee in deze studie geanalyseerde gebieden. Aangetoond wordt dat de situatie van de *comuneros* in deze twee gebieden fundamenteel verschillend is ten gevolge

van de verschillende historische processen die hebben plaatsgevonden.

Gebruik makend van de elementen van het sociale interactiemodel worden relevante variabelen onderscheiden en geoperationaliseerd. Naast de gebruikelijke variabelen, gebaseerd op kenmerken van de nationale maatschappij, worden ook variabelen gebruikt die specifiek zijn voor de *comunero*-bevolking.

Als antecedente variabelen worden gehanteerd: leeftijd, opleiding, monetaire rijkdom, landbezit, traditionele rijkdom, huisbezit als een additionele indicator voor rijkdom, participatie in sociale activiteiten, participatie in typische *comunidad*-activiteiten, contacten met de buitenwereld en het gebruik van de massacommunicatiemedia.

Als intermediaire variabelen worden gebruikt: een aspiratie-index (gebaseerd op het nastreven van een betere toekomst voor de kinderen) en een modernisatie-index.

De afhankelijke variabelen zijn: kennis van de innovaties en het gebruik van de innovaties. De laatste variabele is de uiteindelijke afhankelijke.

Naast de in het sociale interactiemodel gebruikelijke variabelen – dit zijn variabelen op het individuele niveau – wordt een drietal variabelen ingevoerd die betrekking hebben op de *comunidad*. Deze variabelen op *comunidad*-niveau meten de mate van integratie van iedere *comunidad* in de nationale maatschappij, de interne integratie van de *comunidad* en het gelokaliseerd zijn in een gebied waar de innovaties door de staatsorganisaties werden geïntroduceerd of waar hun gebruik verder gestimuleerd werd.

Het blijkt dat in de Mantaro-vallei de innovaties reeds voor het begin van het ontwikkelingsproject bekend waren en dat het acceptatieproces reeds aan de gang was toen het project begon. Niet minder dan 61% van de *comuneros* gebruikte één of meer van de innovaties.

Het blijkt dat acht variabelen van belang zijn om het gebruik van de innovaties in deze streek te verklaren. Deze variabelen zijn: opleiding, huisbezit, monetaire rijkdom, participatie in *comunidad*-activiteiten, het gebruik van de massacommunicatiemedia, de aspiratie-index, de modernisatie-index en kennis van de innovaties. Van deze variabelen, die geïnterreleerd zijn, is er slechts één een typische *comunero*-variabele: de participatie in typische *comunidad*-activiteiten. Dit kan verklaard worden op grond van de historische processen die in deze streek hebben plaatsgevonden: in het verleden zijn de innovaties door de *comuneros* zelf geïntroduceerd, vermoedelijk als een collectieve beslissing. De acht variabelen verklaren tezamen 69,7% van de variantie van het gebruik van de innovaties.

De drie variabelen op *comunidad*-niveau hebben een geringe onafhankelijke invloed op het gebruik van de innovaties; tezamen verklaren zij 19,9% van de variantie.

Als de variabelen op individueel en op *comunidad*-niveau tezamen gebruikt worden, wordt 71,8% van de variantie verklaard.

Het blijkt dus overduidelijk dat in deze streek de individuele variabelen van meer belang zijn om de variantie van het gebruik van de innovaties te verklaren.

In Andahuaylas waren de innovaties vrijwel onbekend voor het project begon; er kan gesteld worden dat het acceptatieproces op gang gebracht is door de staatsorganisaties. Slechts 9% van de *comuneros* in deze streek gebruikte in 1972 één of meer van de innovaties. Niet minder dan twaalf variabelen zijn direct of indirect van belang om het gebruik van de innovaties in deze streek te verklaren. Deze variabelen zijn: opleiding, leeftijd, huisbezit, landbezit, monetaire rijkdom, participatie in sociale activiteiten, participatie in *comunidad*-activiteiten, gebruik van de massacommunicatiemedië, contact met de buitenwereld, de aspiratie-index, de modernisatie-index en kennis van de innovaties. Deze twaalf variabelen vertonen een complexe interrelatie, die alleen verklaard kan worden uit het transitionele karakter van de maatschappij in deze streek. De variabelen die gebaseerd zijn op de nationale cultuur zijn vermengd met typische *comunidad*-variabelen.

Slechts zes variabelen blijken rechtstreeks verband te houden met de acceptatie van de innovaties: opleiding, monetaire rijkdom, landbezit, participatie in sociale activiteiten, gebruik van de massacommunicatiemedië en kennis van de innovaties. Deze variabelen verklaren slechts 9,5% van de variantie van het gebruik van de innovaties.

De drie variabelen op *comunidad*-niveau hebben een relatief belangrijke, onafhankelijke invloed op het gebruik van de innovaties; tezamen verklaren zij 7,8%.

De variabelen op individueel en op *comunidad*-niveau tezamen verklaren 14,5% van de variantie. Hoewel de totale verklaarde variantie in deze streek gering is, blijkt toch het relatieve belang van de variabelen op *comunidad*-niveau.

Dat slechts een gering deel van de variantie in deze streek verklaard kan worden door het sociale interactiemodel, is wellicht te wijten aan de scheve verdeling van de variabele 'gebruik van innovaties' en aan het feit dat in deze streek het effect van de variabelen die 'normaliter' van belang zijn, wordt doorkruist door het optreden van de staatsorganisaties.

Een drietal conclusies moet vermeld worden:

1. De variabelen die typisch zijn voor de *comunidad* hebben hoegenaamd geen invloed op het gebruik van de innovaties.
2. Gerichte sociale actie is in staat de invloed van de variabelen die rijkdom meten, vooral monetaire rijkdom, te reduceren.
3. Het schijnt dat in bepaalde omstandigheden de traditioneel georiënteerde *comunero*, juist vanwege zijn traditionele oriëntatie, de innovaties gaat gebruiken. Of dit gebruik van 'moderne' technieken duurzaam is, moet afgewacht worden.

Curriculum vitae

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Opleiding

Behaalde het diploma van de Algemene Middelbare School (AMS-B) te Paramaribo.

Studeerde Culturele Antropologie en (Westerse) Sociologie aan de Katholieke Universiteit te Nijmegen.

Doctoraal-examen (met lof) in de (Westerse) Sociologie, specialisatie methoden en technieken van het sociologisch onderzoek.

Beroep

1965-1974: verbonden aan het Sociologisch Instituut van de Katholieke Universiteit, Nijmegen.

Gedurende 1968-1973 als deskundige uitgezonden naar Peru door de Directie Internationale Technische Hulp van het Ministerie van Buitenlandse Zaken: *Profesor asociado* in de methodologie en sociale statistiek aan de Pontificia Universidad Católica del Perú (1968-1972) en adviseur aan het Instituto Nacional de Planificación (1973).

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Stellingen

1. De zogenaamde 'Simpson-paradox' is vaak geen werkelijke paradox, aangezien het resultaat is van een incorrecte procedure, namelijk het onjuist samenvoegen van ongestandaardiseerde groepen.

(Cfr. Simpson, C.H., 'The interpretation of interactions in contingency tables', in: *Journal of the Royal Statistical Society*, Series B, Vol. 13, 1951, p. 238.)

2. De aanduiding 'taki-taki' voor het Srenang Tongo of Surinaams is noch Creools, noch Surinaams, maar Europees.

(Contra: Renselaar, H.C. van, in: *Bijdragen tot de Taal-, Land- en Volkenkunde*, Deel 129, 1973, p. 358.)

3. Het zogenaamde 'dual registration'-systeem in het demografisch onderzoek is slechts een academische oefening en draagt niet bij tot het verbeteren van de burgerlijke stand van de ontwikkelingslanden.

4. De opvatting dat de ontwikkelingslanden in het algemeen het zwaarst getroffen zijn door de zogenaamde oliecrisis, is slechts ten dele juist, omdat slechts het financieel-monetaire en wel het betalingsbalans-aspect in beschouwing wordt genomen.

5. Het achteraf evalueren van ontwikkelingsprojecten wordt vaak bemoeilijkt, zo niet onmogelijk gemaakt, doordat het besluit van de technische bijstand verschaffende landen om projecten te financieren vaak wordt genomen op grond van binnenlandse politieke overwegingen die niet geëxpliciteerd (kunnen) worden.

6. Aangezien de gecompliceerde technieken die in de demografie gebruikt worden om de incomplete gegevens van de ontwikkelingslanden te corrigeren, gebaseerd zijn op 'gissingen', zal de demo-

- grafie van ontwikkelingslanden zich moeten toeleggen op het gebruiken van betrouwbare dataverzamelingstechnieken.
7. In gebieden van de ontwikkelingslanden waar religieuze of quasi-religieuze normen bestaan die periodieke seksuele onthouding voorschrijven, zal urbanisatie leiden tot een verhoogde fertiliteit.
 8. Toetsen die gebruikt worden in de zogenaamde Lazarsfeldiaanse multi-variate analyse gebaseerd op de Chi-kwadraat zijn onbevredigend, omdat zij afhankelijk zijn van de omvang van de desbetreffende sub-groepen.
 9. Aangezien er hoe langer hoe meer gestandaardiseerde computerprogramma's beschikbaar komen die gecompliceerde statistische analyses uitvoeren, is het noodzakelijk dat het onderwijs in de statistiek voor de sociale wetenschappen verdiept wordt en vooral aandacht schenkt aan de methodologische achtergronden van de desbetreffende technieken.
 10. De *Leyes de las Indias* bevatten in de 'considerata' gegevens van onschatbare waarde voor de sociaal-historische analyse van de Spaanse koloniale maatschappijen.

Stellingen behorende bij het proefschrift van A.L. Mac Donald, *Social factors related to the use of some modern techniques in agriculture by comuneros in two highland regions of Peru.*

