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Towards a More Employment-Intensive and Pro-Poor Economic Growth in Bolivia¹

by:

Luis Carlos Jemio
Maria del Carmen Choque

La Paz, December 2006

Abstract:

The reform program and growth pattern exhibited by the Bolivian economy in the last decade did not favour employment creation and consequently not an effective reduction of poverty. During the last decade, those sectors where the bulk of employment is concentrated, presented the lowest growth rates of GDP, labour productivity and real incomes.

The present paper analyzes in detail the two sectors where the bulk of employment and poverty is concentrated (agriculture and the urban informal sector) in order to determine the critical constraints to improvements in productivity, employment generation, and reductions in poverty.

Keywords: Employment, Poverty, Growth, Bolivia

JEL classification: J24, O54, O17

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1. Introduction

After the introduction of the structural reform programme in the second half of the 1980s, Bolivia reassumed economic growth, and had a relatively long period of stable economic growth during most of the 1990s. However, growth was relatively modest in those sectors where the poor are employed (e.g., agriculture, micro and small enterprises). The incidence of poverty declined during 1996-99, but increased thereafter. Indeed, poverty persists at very high levels in both rural and urban areas with 80 and 52 percent respectively of the rural and urban population remaining below poverty line in 2001. Such poverty levels are higher than expected for a low-middle income country with a per capita income of nearly \$1,000.

Apart from low and unsustainable economic growth, possible explanations of such high poverty as mentioned above would include a low employment intensity of economic growth, a high degree of inequality in the distribution of income, high degrees of inequality between rural and urban areas - not only in terms of incomes, but also in terms of access to basic services like education, health, sanitation, drinking water, etc., and a large gap in productivity between activities located in the rural and urban areas.

However, high poverty and inequality can be explained in terms of the functioning of the labour market. Low productivity is widespread across all productive sectors, both in urban and rural activities. In general, growth in productivity has been rather limited, and thus a solid basis could not develop for increases in wages and earnings of the self-employed. The poor were also handicapped by a limited access to education, health and income generating assets. In terms of labour market categories, the share of informal workers—e.g. self-employed and family workers—remained high in both rural and urban areas, and they were characterised by much lower real income levels vis-à-vis formal workers (e.g., employees, employers, professionals, etc.).

It is thus clear that efforts at achieving higher and more sustained rate of poverty reduction has to focus on three aspects: higher and more sustained economic growth, a more broad-based growth in terms of the sectors as well as a more employment-intensive pattern of growth, and an enhanced capacity of the poor (in terms of access to health, education, skills, access to productive assets, and finance). The Bolivia Poverty Reduction Strategy (BPRS) addresses this challenge in terms of three broad priority areas: (i) productive development of micro, small and medium-sized enterprises, (ii) social development, and (iii) cross-sectoral priorities relating to gender, indigenous people and environment. It may be noted here that agriculture is included under the broad umbrella of 'productive development', which also includes action in areas like infrastructure, access to land, promoting production through cluster development, and local economic development.

Chapter 2 analyse at the macroeconomic level, the trends followed by different activities in terms of their GDP growth, employment, productivity and real incomes. The different patterns followed by these variables are analysed in detail. The section also discusses the main determinants of workers' incomes, based on income functions estimated utilizing household survey data.

Chapters 3 analyses in detail the main characteristics of the agricultural sector in Bolivia. Agricultural activities comprise the bulk of rural employment. In order to employment and poverty in the rural area, this section analyses the structure of the agriculture sector, in terms

of the main characteristics that define peasant agricultural units. Furthermore, issues such as output growth per crop, land allocation, relative prices trends, physical and monetary yields, labour productivity and poverty incidence etc. are discussed in a detailed fashion. This chapter also analyses the importance of non-crop agricultural activities as an alternative source of employment and incomes for rural workers.

Chapter 4 outlines the main characteristic that a pro-poor growth strategy should be for the rural and agricultural sector. The chapter discussed briefly the main government strategies devised to promote rural development. The chapter then analyses strategies to expand access to external markets, identifying products that would have a larger impact in terms of job creation. The development of export-oriented productive clusters is discussed as a form to integrate small scale agricultural producers to markets as a mean to increase employment and income opportunities.

Chapter 5 analyses the main characteristics of the urban labour market, with special emphasis on micro and small scale firms, which comprises the bulk of urban employment. This chapter analyses the main determinants of workers' low productivity and income levels. The main factors analysed, as determinants of labour productivity, are: firm size, sector of activity, educational attainment of workers, labour category and availability of physical productive assets per worker. A number of policy recommendations are put forward in order to promote economic growth that will benefit the poor.

Chapter 6 discusses the role of public investment in developing productive infrastructure that will favour growth, employment and poverty reduction. Apart from its role in creating productive capacity, public investment in infrastructure can help to create employment in the short term. In terms of the choice of technology, the adoption of labour-based approaches in the construction of infrastructure can result in much higher employment from a given amount of investment without the need to compromise on quality and efficiency.

Finally, Chapter 7 offers some conclusions and recommendations.

2. The Labour Market and Poverty

Bolivia's economic growth pattern has not favoured the creation of good quality and stable employment. The market oriented reform program implemented since 1985, brought about a period of relatively stable, albeit moderate economic growth. The reform program included, in its first stage, board price liberalizations, foreign trade and financial flows liberalization, and the introduction of more flexibility into labour market relations. During the 1990s, Bolivia deepened its reform program, by implementing a series of structural reforms aimed at improving its institutions and the overall functioning of the economy, which in turn would promote faster economic growth. The reform program included a pension reform, privatization of main state enterprises, education reform, decentralization of public administration, amongst the most important.

The reform program brought about some positive results: a relatively long period of stable economic growth, price stability, a substantial increase in the flows of foreign direct investment, financial deepening and the improvement of some poverty indicators. However, the reform program was less successful in creating employment opportunities for the bulk of the Bolivian population and in reducing income disparities among workers. The growth pattern exhibited by the Bolivian economy was based on activities that are not labour

intensive. On aggregate, these activities only comprise 10% of total employment. The capitalization program (Bolivian privatization program) carried out between 1994 and 1997, entailed deep reforms in sectors where public enterprises carried out activities, such as energy, telecommunication, railroads, air transportation, and mining. These reforms favoured and promoted an increase in foreign direct investment flows to these non-labour intensive sectors. The reform program also included financial liberalization and privatization of basic services, which in turn favoured investment flows to sectors such as water and financial services. Between 1996 and 2003 the FDI flows received by these types of activities amounted on average to US\$ 621 million. Extractive activities, especially the hydrocarbons sector, received on average US\$ 368.3 million in FDI flows. As a result, the country was able to attain a tenfold increase in its natural gas reserves. Between 1996 and 2004, GDP in the hydrocarbon sector almost doubled, increasing at an annual rate of 8.5% on average during this period. Other sectors that benefited from important FDI flows were transport and communication, that received annual average flows amounting US\$ 150.6 millions. Electricity, gas and water received US\$ 57.7 millions a year on average. This was also the result of the capitalization process. Finally, the banking sector received FDI flows of about US\$ 39.7 millions a year. Large FDI flows brought about sharp labour productivity increases in sectors such as hydrocarbons and financial services.

The reform program did not place equal attention to labour intensive sectors. According to data presented in tables 1 and 2, these sectors, comprising 90% of total employment, have lagged behind non-labour intensive sectors in terms of growth of GDP, productivity and real incomes. FDI flows only arrived in sizeable amounts to the construction and manufacturing sectors. As a result, large disparities in labour productivity developed among labour and non-labour intensive sectors in terms of labour productivity and incomes received by workers (Table 1). According to Table 1, in 2003 labour productivity in labour intensive sectors was only 12% of that existing in non-labour intensive activities. Labour productivity was extremely low in construction and agriculture activities. On the other hand, manufacturing presented the highest productivity level among labour intensive activities.

In terms of real incomes, during the period 1996-2003, workers engaged in labour intensive sectors earned incomes that on average were 32% of incomes perceived by workers in non-labour intensive sectors. Agricultural workers were affected by the lowest income levels, while workers engaged in construction activities benefited from the highest incomes among labour intensive sectors.

Table 1
Productivity, Employment and Real Incomes
(1996-2001)

Sectors	Labour Intensity (workers per unit of output)	Share in total employment 2003 (%)	Share in total GDP 2003 (%)	Labour Productivity (output per worker)	Average monthly income (Bs. 1991)	Average FDI flows 1996-2003 (million US\$)
Labour intensive sectors	306,3	90,2	53,1	3,3	281	202,4
Construction	452,2	7,3	2,9	2,2	513	110,0
Agriculture, forestry and fishery	448,6	39,3	15,8	2,2	144	0,5
Community, social and personal services	420,3	11,3	4,8	2,4	480	0,0
Commerce	330,6	16,2	8,8	3,0	420	18,5
Restaurant and hotel	298,3	5,4	3,3	3,4	391	4,2
Manufacturing industry	111,6	10,8	17,5	9,0	394	69,2
Non-labour intensive sectors	45,0	9,8	46,9	26,5	867	621,7
Transport, storage and communication	69,7	4,6	11,8	14,3	706	150,6
Business services	39,4	2,1	9,5	25,4	982	5,4
Public Administration	35,2	1,9	9,8	28,4	950	0,0
Electricity, gas and water	32,7	0,4	2,2	30,6	1107	57,7
Financial services	16,5	0,3	3,7	60,5	1677	39,7
Mining and hydrocarbons	10,1	0,6	10,0	98,8	828	368,3
Total	180,4	100	100	5,5	381	824,2

Source: Own estimates based on data published by the National Institute of Statistics

Likewise, there were large disparities in labour productivity growth among sectors. Table 2 shows that between 1996 and 2003, productivity in non-labour intensive activities grew by 2.5% a year on average. This rate was 3.6 times greater than the productivity growth rate exhibited by labour intensive activities. The gap existing between these two types of activities, in terms of labour productivity growth, is explained by a faster GDP growth and a slower employment growth shown by non-labour intensive sectors. Differences in productivity growth were translated into growth rates disparities of workers' real incomes. Between 1996 and 2003, real incomes earned by workers in labour intensive sectors decreased on average by 6.5% a year. This rate is almost 7 times greater than that at which real incomes decreased in non-labour intensive activities during the same period of time.

Thus, the reform program and growth patterns exhibited by the Bolivian economy in the last decade did not favour employment creation and consequently an effective reduction in the incidence of poverty. Those sectors, where the bulk of employment is concentrated, presented the lowest growth rates of GDP, labour productivity and real incomes. Besides, these sectors were affected by the highest levels of poverty incidence. Agricultural workers for instance, that comprise 39.3% of total employment at the national level, have 81.7% of poverty incidence, measured by their income levels. Agriculture comprises 85.2% of total rural employment. On the other hand, the urban activities that employ most of the urban labour force are manufacturing, construction, commerce and other services. Manufacturing workers for instance, comprise 10.8% of total employment and have poverty incidence levels as high as 53.8%. Workers employed in other service activities (i.e. commerce, community, social and personal services, restaurant and hotel) comprise 32.9% of total employment and are affected by 48.3% of poverty incidence. Finally, construction workers comprise 7.3% of employment and present 56.2% of poverty incidence.

Table 2
Productivity, Employment and Real Incomes
(Average growth rates – 1996-2003)

Sectors	Employment	GDP	Productivity	Real Incomes
Labour intensive sectors	1,58	2,28	0,69	-6,51
Construction	8,06	-0,74	-8,15	-3,25
Agriculture, forestry and fishery	-0,28	2,54	2,83	-3,84
Community, social and personal services	2,30	3,51	1,18	4,62
Commerce	2,32	2,24	-0,08	-7,72
Restaurant and hotel	7,25	2,20	-4,70	-9,67
Manufacturing industry	1,31	2,31	0,99	-1,74
Non-labour intensive sectors	1,05	3,59	2,51	-0,93
Transport, storage and communication	3,36	4,13	0,75	-4,85
Business services	7,23	4,46	-2,58	-2,77
Public Administration	-2,30	3,06	5,48	4,83
Electricity, gas and water	7,09	2,80	-4,01	-1,75
Financial services	-3,71	4,42	8,43	1,20
Mining and hydrocarbons	-11,47	2,61	15,90	4,68
Total	1,52	2,88	1,33	-4,47

Source: Own estimates based on data published by the National Institute of Statistics

Determinants of sectoral incomes

In order to estimate the importance of different factors in determining income levels among workers employed in different activities, separate income functions were estimated based on household survey data. These functions (Table 3) calculate the expected percent changes in worker's income in response to changes in various workers' characteristics, such as educational level, working experience, place of residence, gender, occupational category, spoken language, and affiliation to a trade union. Separate functions were estimated: first, an aggregate income function for all workers at a national level; second, separate functions for urban and rural workers; and third, separate income functions for the different productive activities where workers are employed, both, in rural and urban areas. The main findings of this analysis are presented in what follows.

First, as it is commonly found in several studies on poverty in Bolivia, the educational level attained by workers substantially contributes to improve their incomes. At the national level, an additional year of schooling contributes to increase workers' incomes by 8.9%. Educational attainment is more significant in increasing incomes for rural workers than for their urban counterparts. An additional year of schooling is expected to increase rural workers' incomes by 10.4% and urban ones' by 8.4%. In rural areas, additional years of schooling may have a greater income return in agricultural activities (7.6%) compared to non-agricultural activities (6.7%). In urban areas, the highest returns of additional years of schooling are in urban services (9%)—i.e. commerce, restaurant, informal services—followed by modern services (7.4%), manufacturing (5.6%), extractive activities (5.3%) and construction (3.2%). It is interesting to notice that in the agriculture sector and in urban non-

modern services, where workers' incomes are the lowest and poverty incidence the highest, the returns on education are the greatest.

Second, working experience also contributes to improve workers' incomes. Each additional year of working experience improves workers' incomes by 3.3% at the national level. Years of experience has a greater return for urban (3.7%) vis-à-vis rural (2.3%) workers. In rural areas, experience is more relevant in improving income earnings for workers employed in non-agricultural sector (3.5%), than for those labouring in agricultural activities (1.5% per each additional year of working experience). In urban areas, experience is more relevant in improving incomes for workers employed in activities such as manufacturing (3.5%), services (3.6%), and less relevant for workers engaged in extractive activities (1.1%) and construction (1.4%).

Third, place of residence is a very important in determining workers' income differential. For workers employed in urban areas, incomes tend to be higher than those earned by rural workers. At the national level, urban workers are expected to earn incomes that are 55.1% higher than those received by rural workers.

Fourth, gender also contributes to explain income differentials among workers. At the national level, male workers tend to earn incomes 4.5% higher than their female counterparts. In urban areas, gender is a variable that can bring about even greater income disparities. Urban-male workers' incomes tend to be 10.8% higher than those of urban-female workers. In the rural area, gender is a far less relevant variable in explaining income differentials. In urban areas however, gender importance in explaining income differentials among workers become quite impressive. Male workers engaged in extractive activities tend to earn 30.7% higher incomes than female workers. The same pattern is observed in the manufacturing sector, where male workers earn incomes 27.1% higher than female counterparts.

Fifth, occupational category of workers is also quite relevant in explaining income disparities. At the national level, workers engaged in formal activities, (salaried workers, employers, etc.) earn incomes 45.2% higher than informal workers (self employed, family workers, household service workers). These differences are even higher in the rural area, where formal workers earn incomes 72.3% higher than those earned by informal workers. In the case of rural agricultural workers, their occupational category is also important in explaining income differentials, for both, workers employed in agricultural activities as well as for those working in non agricultural ones. In urban activities, workers' occupational category is also important in explaining income differentials between informal and formal workers, in sectors such as extractive mining and hydrocarbons activities, manufacturing, construction, and other urban activities.

Finally, language spoken is also paramount in explaining income differentials. At the national level, indigenous workers tend to earn incomes 26% lower than non indigenous counterparts. Income disparities are much larger in rural areas, between indigenous and non-indigenous workers, compared to those existing among urban workers. In rural areas, income disparities between indigenous and non-indigenous workers engaged in agricultural activities are much higher than disparities observed between workers in non agricultural activities. In urban areas, income differentials between indigenous and non-indigenous workers are much larger in activities such as mining and hydrocarbons, construction and services. Differences are smaller in activities like manufacturing and modern services.

Table 3
Income Function by geographic location and sectoral activity of workers

	NATIONAL			URBAN					RURAL	
	National	Urban Area	Rural Area	Mining and Hydrocarbons	Manufacturing	Modern Services (electricity, communication, storage, transport)	Construction	Other Urban Activities	Agriculture, Livestock, Hunting and Fishing	Other Rural Activities
Dependent Variable	Lnyh	Lnyh	Lnyh	Lnyh	Lnyh	Lnyh	Lnyh	Lnyh	Lnyh	Lnyh
Constant	-0,615 (-10.81864)	-0,099 (-1.789618)	-0,360 (-2.893674)	0,856 (-1,629001)	-0,177 (-1,171398)	0,565 (2,275472)	0,763 (3,378305)	-0,102 (-1,488869)	-0,341 (-1,941988)	-0,171 (-1,203125)
Educational Level	0,089 (26.84772)	0,084 (24.8158)	0,104 (13.88885)	0,053 (2,472964)	0,056 (6,057904)	0,074 (6,546537)	0,032 (3,119002)	0,090 (20,709187)	0,076 (6,487451)	0,067 (7,693106)
Working Experience	0,033 (13.13167)	0,037 (13.4494)	0,023 (4.190886)	0,011 (0,533818)	0,035 (5,145999)	0,030 (2,882834)	0,014 (1,720335)	0,036 (10,653428)	0,015 (2,071646)	0,035 (4,889843)
Square of Working Experience	0,000 (-12.41875)	-0,001 (-11.81661)	0,000 (-4.134522)	0,000 (-0,611398)	0,000 (-4,101597)	0,000 (-1,034505)	0,000 (-0,978350)	-0,001 (-9,896965)	0,000 (-1,967890)	0,000 (-4,499932)
Place of Residence	0,551 (19.03194)									
Gender	0,045 (1.664634)	0,108 (3.862951)	-0,006 (-0.105175)	0,307 (0,864309)	0,271 (3,811982)	-0,342 (-2,032561)	0,013 (0,082122)	0,081 (2,210498)	0,228 (2,594320)	0,329 (4,742302)
Occupational Category	0,452 (16.14633)	0,295 (10.0539)	0,723 (12.50800)	0,267 (1,6810153)	0,349 (4,835710)	-0,106 (-1,209281)	0,243 (3,326508)	0,296 (7,465674)	0,647 (8,275323)	0,352 (4,751717)
Language	-0,263 (-9.758927)	-0,139 (-4.970373)	-0,557 (-9.844638)	-0,386 (-1,830097)	-0,077 (-1,188314)	0,034 (0,408323)	-0,187 (-2,646914)	-0,163 (-4,4630330)	-0,758 (-10,339226)	-0,210 (-2,903401)
Trade Union Affiliation	0,075 (2.454288)	0,212 (6.346114)	-0,112 (-1.94976)	-0,319 (-1,848768)	0,189 (1,939325)	0,078 (0,879764)	0,324 (2,343406)	0,241 (5,443787)	-0,233 (-3,203966)	0,296 (3,692824)
R Square Adjusted	0,29782	0,23225	0,20742	0,17121	0,13945	0,12470	0,07112	0,27830	0,15437	0,23443
F Statistic	422,91	221,31	108,90	4,95	18,50	10,10	5,90	183,40	52,82	40,28
Number of observations	7987	5100	2887	134	756	447	448	3311	1988	898

Note.- The number between parenthesis are the values of the T-statistic

Detalle de variables	
Lnyh	LnMonthly income in main working activity
Educational Level	Years of schooling
Experience	Years
Place of Residence	1= Urban Area 0= Rural Area
Gender	1= Male 0= Female
Occupational Category	1= Formal sector 0= Informal sector
Language	1= Native language 0= Spanish

3. Growth, Productivity, and Returns in Agriculture

Agriculture sector's structure in Bolivia and the peasant economy

The agricultural sector is one of the most important sectors in the Bolivian economy, because it comprises about 15% of total GDP, 41.9% of employment at a national level (85.6% of rural employment) and 26% of exports, including industrially processed agricultural products.

As it is customary in almost all productive sectors in the Bolivian economy, the agriculture sector is characterized by a dual nature. There is a modern corporate agricultural sector, comprising entrepreneurial productive units, simultaneously coexisting with traditional agricultural activities carried out by small-scale family-type units. The modern entrepreneurial sector aims its production mainly to export markets, utilize wage labour and use relatively capital intensive productive processes. Modern agro-industry companies are mostly located in the eastern part of the country, more specifically in the Santa Cruz region. The main crops produced by modern agricultural companies are soya beans, sunflower, cotton, wheat, and sugarcane. This production is later processed into more industrialized products, such as cooking oil, soya cakes, processed sugar, flour, etc. Eventually, this production is exported or sold in the domestic market.

Conversely, the so called traditional agriculture comprises peasant-family type productive units, producing principally to satisfy their basic food self consumption needs. These activities are organized in small-scale labour-intensive units, using low levels of capital and technology. Access of these productive units to domestic markets varies depending on their geographic location, existing more market integration in those units located in the valley region (Cochabamba, Chuquisaca and Tarija regions), and less market integration for those units located in the high plateau area (Altiplano), in the west part of the country. This sector produces the bulk of food supply which is consumed domestically. The main crops produced are potato, yucca, maize, rice and quinoa. Workers involved in traditional agriculture activities are also affected by the highest poverty incidence in the country, since almost 90% of rural workers that are employed in agricultural activities are categorized as being poor.

Peasants are not a uniform (homogeneous) set of farm families all with the same status and prospects within their communities. On the contrary, peasant societies are always and everywhere typified by internal differentiations along many lines. In Bolivia there are three distinguishable peasant groups: first, a group where subsistence farming predominates; second, a group where subsistence farming is mixed with market-oriented farming; and third, a group of peasants engaged in the production of coca leaves.

The first group consists of various small communities and ex-haciendas located principally in the southern and central high plains or Altiplano. The small size of farms, poor quality of land, rudimentary technology of production and difficult communications, have contributed to maintain very low level of productivity in the zone. Furthermore, the soil has been severely exhausted by intensive use, and in any given year, two-thirds of the land has to be kept idle to allow soils to regenerate. Most farmers cultivate low-productivity small farms to produce staples and vegetables (potatoes, maize, beans, quinoa, etc.). They have poor links to markets and credit institutions, and sell on average less than 30 per cent of their output (World Bank 1990).

The second group includes the majority of peasants located in the regions of the mountain valleys and Altiplano, where land reform was introduced. The predominant crops grown by this second group are: potatoes, barley, quinoa, wheat and corn. Livestock and poultry production is also common. Production techniques, which continue to be quite traditional, are labour intensive and usually use only animal power. The family is the principal unit of production. Except on rare occasions, paid workers are not employed, and the traditional forms of labour sharing and cooperation are sufficient to satisfy farm labour requirements even in periods of high demand. Despite the low productivity levels, relatively favourable weather and soil conditions allow two-crop farming in the region. Production often covers the needs of the national market for many basic foodstuffs.

The third group of peasants comprises those engaged in the production of coca. This sector comprises both the traditional harvest of coca leaves for customary local consumption and that part of the production that is utilized in the illicit production of cocaine and feeds the illegal international drug trade. In Bolivia, coca is grown in the subtropical and tropical regions of the departments of Cochabamba and La Paz and covered about 28,500 hectares in 2003, of which 12,000 hectares is intended for traditional consumption. The other 16,500 hectares are cultivated to produce raw material for the drug industry.

Peasants, as farmers, have access to the resource of land as the basis of their livelihood. An important attribute of peasants worldwide is the significance of non-market criteria in the allocation of land. In Bolivia, the size of landholdings of farmers practising traditional agriculture range from half a hectare in the vicinity of Lake Titicaca and the Cochabamba Valley, to 15-25 hectares in some of the drier areas of the Altiplano and mountain valley regions. Approximately 55 per cent of the properties in these zones are less than 5 hectares in size, and more than two-thirds of them are fewer than 10 hectares. The relatively small sizes of farms in traditional agriculture are largely the result of the land reforms implemented in 1953 which broke up large estates and parcelled them out to landless.

It is generally agreed that reliance on family labour is a defining economic characteristic of peasants. In Bolivia, family labour is used intensively in land preparation, seeding, insect and weed control, livestock management, and harvesting, and in domestic activities such as spinning and weaving. Labour is the most important of all productive factors and is supplied almost exclusively by the family, augmented by traditional community labour pools.

Perhaps the most popular defining feature of peasants used by economists is the subsistence basis of their livelihood. Subsistence refers to the proportion of farm output that is directly consumed by the household rather than sold in the market. The degree of subsistence is one of the reasons why the integration of peasants into the market economy is only partial. Bolivian rural households consume a large part of their production. As stated before, only 30 per cent of agricultural output reaches the market. Households' total cash income depends not only on the marketable surplus but also on prices. Since the demand for agricultural products in Bolivia is price-inelastic (elasticity was on average -0.73 during the 1980s), an increase in agricultural output and therefore in marketable surpluses tends to move relative prices against the sector. As a consequence, the cash incomes of rural households fall in relative terms. This in turn might cut down their consumption of goods and services purchased in the market.

Agricultural sector growth patterns

During the last two decades, the agriculture sector as a whole, i.e. including forestry, hunting and live-stock activities, exhibited very low growth rates averaging 2.2% a year (Table 4), which is below the rate of growth of population. Except for the period 1990-1997, when growth averaged 4.1% a year, agricultural activities grew at a very slow pace, especially during the 1980-1990 period, when growth was only 1.2% a year. This low performance was caused by the negative effects of adverse weather conditions, such as droughts and floods, caused by the Corriente del Niño, that affected the country in 1983 and 1989. As a result, the share of traditional agriculture activities in total GDP dropped from 8.5% in 1985 to 6.4% in 1993.

There are different problems that limit the productive development of the agriculture sector in Bolivia. The National Strategy for Agricultural and Rural Development (ENDAR), elaborated by the Ministry of Peasant and Agriculture Affairs¹, summarizes these problems in two broad categories: i) narrowness of domestic markets and limited access to foreign markets, and ii) low levels of productivity, which are in turn caused by a number of different factor, namely: land erosion, inadequate access to productive lands and judicial insecurity, technological lag, limited access to credit, poor rural infrastructure (e.g. electricity, irrigation, local roads).

Non industrial traditional agricultural activities account for the largest share in Bolivia's agricultural GDP. The sector exhibited a very low and unstable growth pattern over the last two decades. Overall, growth stood at 2.4% a year on average during the period 1980-2003, just above the rate of growth of population. During the 1985-1990 period however, the average yearly growth rate was negative (-1.2%) owing to adverse climate conditions.

Table 4
Agricultural Sector Growth Pattern

Yearly Average Growth Rate (percentage change)

	1980-85	1985-90	1990-97	1997-2003	1980-2003
AGRICULTURE, FORESTRY, AND FISHERY	1,2	1,2	4,1	1,8	2,2
Non Industrial Agricultural Products	5,9	-1,2	2,9	1,9	2,4
Industrial Agricultural Products	3,0	7,3	15,1	1,8	7,2
Coca	9,1	5,7	-2,1	-21,3	-3,7
Live stock	-4,4	1,1	2,8	3,9	1,1
Forestry and Fishing	-9,9	7,9	1,0	4,0	0,7

Share of Sectors in Total GDP (percentage)

	1980	1985	1990	1997	2003
AGRICULTURE, FORESTRY, and fishery	13,8	16,2	15,4	15,2	14,7
Non Industrial Agricultural Products	5,8	8,5	7,2	6,6	6,4
Industrial Agricultural Products	0,9	1,2	1,5	3,0	2,9
Coca	0,6	1,1	1,3	0,8	0,2
Live stock	5,2	4,6	4,4	4,0	4,3
Forestry, and Fishery	1,2	0,8	1,0	0,8	0,9

Source : National Institute of Statistics

¹ Annex A anal ices in more detail the different problems that limit the productive development of the agriculture sector in Bolivia identified in The National Strategy for Agricultural and Rural Development (ENDAR)

Table 5
Agricultural Production by Crop
(percent changes)

	Production (tons)			Production Growth (percent change)		
	1992	1997	2003	1992-1997	1997-2003	1992-2003
Non-Industrial Agriculture						
Tomato	47.016	90.553	135.168	14,0	6,9	10,1
Sorghum	78.053	143.808	176.400	13,0	3,5	7,7
Broad bean	30.959	47.330	59.230	8,9	3,8	6,1
Maize	429.713	498.414	707.737	3,0	6,0	4,6
Grape	18.795	23.718	30.466	4,8	4,3	4,5
Coffee	15.179	22.608	24.544	8,3	1,4	4,5
Vetch	14.601	19.501	23.558	6,0	3,2	4,4
Alfalfa	117.358	142.528	172.875	4,0	3,3	3,6
Banana	468.796	512.811	626.779	1,8	3,4	2,7
Quinoa	16.858	26.366	22.200	9,4	-2,8	2,5
Potato	603.062	659.150	786.766	1,8	3,0	2,4
Yucca	324.498	314.988	392.269	-0,6	3,7	1,7
Rice	229.292	255.586	272.738	2,2	1,1	1,6
Barley	50.886	64.189	59.811	4,8	-1,2	1,5
Wheat	95.727	168.547	88.674	12,0	-10,2	-0,7
Industrial Agriculture						
Sunflower	29.500	80.700	178.500	22,3	14,1	17,8
Soya	342.463	1.040.365	1.550.802	24,9	6,9	14,7
Sugar cane	3.408.106	3.927.832	4.872.080	2,9	3,7	3,3
Peanut	10.416	13.088	13.975	4,7	1,1	2,7
Cotton	6.310	22.461	1.854	28,9	-34,0	-10,5
Coca	80.300	70.100	17.210	-2,7	-20,9	-13,1

Source: Own estimates based on data published by National Institute of Statistics and Ministry of Agriculture

According to Table 5, the production of crops customarily produced by traditional agriculture, such as maize, potato, yucca, rice, quinoa exhibited average growth rates ranging from 1.6% a year (rice) to 4.6% a year (maize). Quinoa, which is an Andean cereal with interesting potential to increase income opportunities in very poor peasant economies, grew by 2.5% a year. After growing strongly during the first half of the 1990s (by 9.4% a year on average), production decreased by 2.8% a year on average between 1997 and 2003.

The most dynamic sector within the agricultural sector was the entrepreneurial agro-industry, which presented growth rates averaging 7.2% a year over the last two decades. Growth was especially high between the years 1990 and 1997, when the annual average growth rate stood at 15.1%. Favourable price conditions in the export markets promoted the export expansion. Due to this dynamic performance, the share of industrial agricultural activities in total GDP increased from 0.9% in 1980 to 2.9% in 1993. As a result, the sector's supply in domestic market increased significantly, substituting food imports, and succeeding in expanding export supply. Agro-industry exports increased by 9.4% a year during the 1980-2003 period, being growth especially high during the 1985-1997 period, when the sector's export incomes

increased by 25.5% a year. As a result, the share of agro-industry products in total exports increased from 4.4% in 1985 to 38.7% in 1997.

Most of the agro-industry production boom during the last decade is explained by the outstanding expansion in the production of soya and sunflowers for the export markets. Soya production increased from 342 thousand tons in 1992 to 1,550 thousand in 2003, representing an average growth rate of 14.7% a year. The production of sunflower, which is the raw material for the production of cooking oil, also exhibited a substantial increase, varying from 29.5 thousand tons in 1992 to 178.5 thousand tons in 2003, representing a yearly average growth rate of 17.8%. Other more traditional industrial agricultural products, such as sugarcane increased but at a much slower pace (3.3% a year on average during the same period). Cotton production had experienced a recovery during the first half of the 1990s. Starting from 1997 however, there was a sharp reduction in production due to less favourable conditions in export markets. On average, cotton production growth rate was negative between 1990 and 2003 (-10.5% a year on average).

Table 6
Agro-industry Exports

Average rate of growth of agroindustry exports					
	1980-1985	1985-1990	1990-1997	1997-2003	1980-2003
Sugar	-49,0%	78,2%	-5,1%	-0,3%	-6,4%
Coffee	-7,9%	0,8%	9,2%	-21,2%	-8,7%
Brazilian nut			10,5%	-29,8%	
Wood	-28,5%	53,6%	5,7%	-15,9%	-1,4%
Soya & by products	-2,7%	55,4%	26,1%	3,8%	35,2%
Cotton			17,6%	-40,2%	
Leather	-21,8%	79,6%	-8,0%	4,8%	11,3%
Cattle	-1,8%	111,6%	-43,3%	-100,0%	-100,0%
Agroindustry exports' share in total exports					
	1980	1985	1990	1997	2003
Sugar	4,9%	0,3%	3,4%	1,9%	1,5%
Coffee	2,0%	2,0%	1,5%	2,3%	0,4%
Brazilian nut	0,0%	0,0%	1,7%	2,7%	0,3%
Wood	3,0%	0,9%	5,4%	6,3%	1,8%
Soya & by products	0,6%	0,8%	5,2%	20,8%	21,0%
Cotton	0,0%	0,0%	0,0%	3,5%	0,1%
Leather	0,5%	0,2%	2,9%	1,3%	1,3%
Cattle	0,1%	0,2%	5,3%	0,1%	0,0%

Source : National Institute of Statistics - Central Bank of Bolivia

Despite the successes attained, business agricultural production has faced difficulties to competitively expand and diversify its production. The agro-business sector had problems to consolidate foreign markets, due to different conditions that limit its competitiveness, some of them of structural nature and hard to be solved in the short term. A reflection of the foregoing is the fact that the sector has proved to be extremely vulnerable to external shocks. Due to the international economic crisis that reduced export prices, agro-industry exports decreased by an average rate of 2.7% a year between 1997 and 2003 and its share in total exports dropped to 26.4% in 2003 (Table 6).

Finally, coca production had remained relatively constant at about 80 thousand tons a year between 1991 and 1997. Starting from 1998 however, the government embarked on a severe coca eradication programme reducing total farmed area from 45.8 thousand hectares in 1997 to 14.6 thousand hectares in 2000, bringing about a drop in production from 70.1 thousand tons to 14.2 thousand tons during the same period. As a result, an estimated income flow of between US\$ 200 to US\$ 300 million a year was taken out of the Bolivian economy, contributing to deepen the economic crises the economy faced starting from 1999. Coca eradication also affected a population of 120,000 coca producers that grow coca leaves in the Chapare and Yungas regions.

Land tenure and land allocation in agriculture

The current distribution of land in Bolivia, which is extremely skewed, is primarily a regional disparity between traditional peasant regions and the newly developed agricultural frontier. Information available from the 1989 partial agricultural census, on the size distribution of landholdings in the country indicate that 0.63% of holdings covered in the census (those in excess of 2,500 hectares) occupied 66.4% of the land. Virtually all of these landholdings are in the Eastern Lowlands and Chaco regions of the country (Beni, Santa Cruz, and parts of Chuquisaca and Tarija). On the other extreme, 52.5% of landholdings (those of less than three hectares) occupy only 0.77% of the land. Almost of all them are in the highland and valley regions of the country. These figures show that over the last three decades, there has been a gradual process of land concentration in the newly developed regions of the country.

It is expected that the pattern followed by the agricultural frontier expansion during the 1990s has skewed land distribution even further. Most of expansion in farmed area took place in the form of large to medium size independent commercial agricultural farms. In Santa Cruz there are about 14 thousand soya producers, of which 80% are small scale producers, sowing in small plots sizing between 1 to 50 hectares. Only 2% of producers poses areas larger than 1,000 hectares, comprising large producers and corporations.

Rural poverty and inequitable access to land are primarily regional and indigenous in character. Bolivia is a very heterogeneous country in terms of land tenure systems. The large size of its territory (1.09 square kilometres), complicated topography (from low, humid and vast savannas to high and arid Andean mountains and valleys), diversity of climates, soils and vegetations, very low population density (only 9.0 inhabitants per square kilometre nationally, and about half that in rural areas), and precarious transportation infrastructure, have resulted in quite different land tenure systems².

The amount of good-quality land in Bolivia is only a small portion of its territory (most land has forestry potential), but it is quite large compared to the size of its population, especially in the eastern regions. In 2003, the total cultivated area in Bolivia was of approximately 2.06 million hectares (about 1.9% of the total Bolivian territory). Between 1990 and 2003, the agricultural frontier increased 47.3% (Table 7), representing a total additional farmed area of about 660 thousand hectares (about 50 thousand additional hectares a year). Most of this expansion took place in the eastern regions, and more specifically in the Santa Cruz region, owing to the export oriented agro-business expansion. Soya and sunflower were, without any doubt, the two agricultural products presenting the largest and fastest increases in terms of the farmed area and volumes produced.

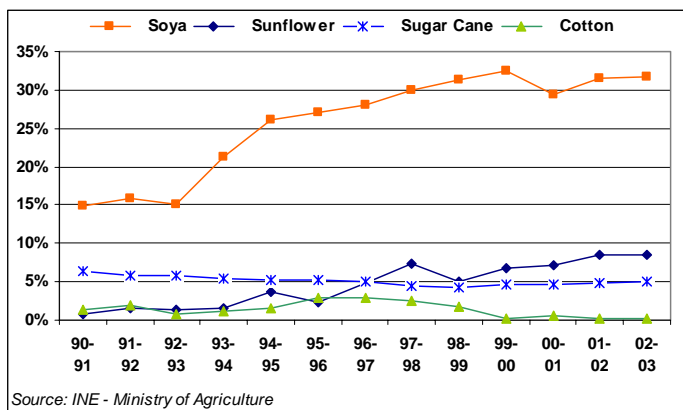
² Annex B analyses in more detail the typologies of existing land tenure in Bolivia identified by the World Bank (1996)

Table 7
Expansion of the agricultural frontier

	Farmed Area (hectares)		change in hectares	share in change	change in percent
	1990	2003			
Total	1.395.760	2.056.356	660.596	100,0%	47,3%
Non-Industrial Agriculture					
Maize	281.129	301.650	20.521	3,1%	7,3%
Rice	125.013	142.488	17.475	2,6%	14,0%
Potato	136.887	129.500	-7.387	-1,1%	-5,4%
Wheat	118.350	103.840	-14.510	-2,2%	-12,3%
Barley	92.335	87.730	-4.605	-0,7%	-5,0%
Banana	51.757	63.757	12.000	1,8%	23,2%
Sorghum	25.048	61.415	36.367	5,5%	145,2%
Yucca	32.296	38.963	6.667	1,0%	20,6%
Quinoa	38.700	34.480	-4.220	-0,6%	-10,9%
Broad bean	27.524	33.200	5.676	0,9%	20,6%
Alfaalfa	18.871	27.085	8.214	1,2%	43,5%
Cofee	22.136	25.304	3.168	0,5%	14,3%
Vetch	12.241	13.776	1.535	0,2%	12,5%
Tomato	4.348	10.153	5.805	0,9%	133,5%
Grape	3.642	4.898	1.256	0,2%	34,5%
Industrial Agriculture					
Soya	221.931	653.220	431.289	65,3%	194,3%
Sunflower	21.500	175.000	153.500	23,2%	714,0%
Sugar Cane	79.835	105.242	25.407	3,8%	31,8%
Peanut	10.437	12.165	1.728	0,3%	16,6%
Cotton	26.280	4.040	-22.240	-3,4%	-84,6%
Coca	45.500	28.450	-17.050	-2,6%	-37,5%

Source: Own estimates based on data published by National Institute of Statistics and Ministry of Agriculture

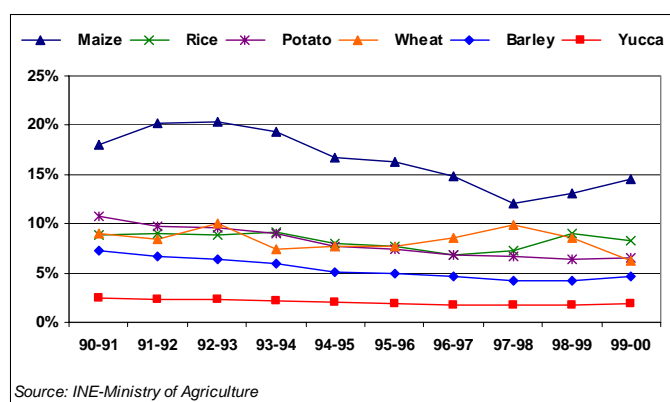
Graph 1
Industrial crops' share in total farmed area



As can be seen in graph 1, the land area allocated to the production of soya expanded in about 431 thousand additional hectares during that period, representing an increase of 194% in the total area devoted to the production of this crop. Due to this observed patterns, soya increased its share in the total farmed area from about 15% at the beginning of the 1990s, to more than 30% in the farming

year 2002-2003. Soya is mainly produced in the Santa Cruz department. The area of land used to produce sunflower increased by 153 thousand hectares (increase of 714%). As a result, sunflower increased its share in total farmed area from 1.5% in the farming year 1991-1992 to 8.5% in the farming year 2002-2003. The area of land used in the production of sorghum increased by 36.4 thousand hectares (145.2% increase) and the that used in the production of sugar cane by 25 thousand hectares (31.8% increase). In total this four products explain 97.9% of the expansion in the agricultural frontier. Soya alone explains 65.3% of the expansion and sorghum 23.2%. Finally, the other hand, the area allocated to the production of cotton decreased from 26.8 thousand hectares at the beginning of the 1990s to only 4 thousand hectares in the farming year 2002-2003. This resulted in a reduction in the share of cotton on total farmed area from 1.9% to 0.2% between the same period.

Graph 2
Non-Industrial crops' share in total farmed area



The amount of land allocated to the production of non industrial crops, followed a very varied pattern (Graph 2). Between 1990 and 2003, there were increases in the area of land allocated to the production of maize, rice, banana, yucca, broad bean, alfalfa, coffee, vetch, tomato and grapes. These expansions however were much smaller compared to those observed in the case of industrial crops, especially in the cases of soya and sunflower.

The most notorious cases were maize and rice. Land used in the production of maize increased by 20.5 thousand hectares between the periods analysed, representing a 7.3% increase. This explains only 3.1% of the total increase in the agricultural frontier. Land allocated to rice expanded by 17.5 thousand hectares (14% increase) and represent only 2.6% of the total agriculture frontier expansion.

On the other hand, there were decreases in the land area allocated to crops traditionally produced by peasant farmers such as potato, wheat, barley and quinoa. As a result, the share of these crops in total farmed area dropped to only 6.3% in the case of potato, 5% for wheat, 4.3% for barley and 1.7% in the case of quinoa.

Table 8
Crop share in total farmed area

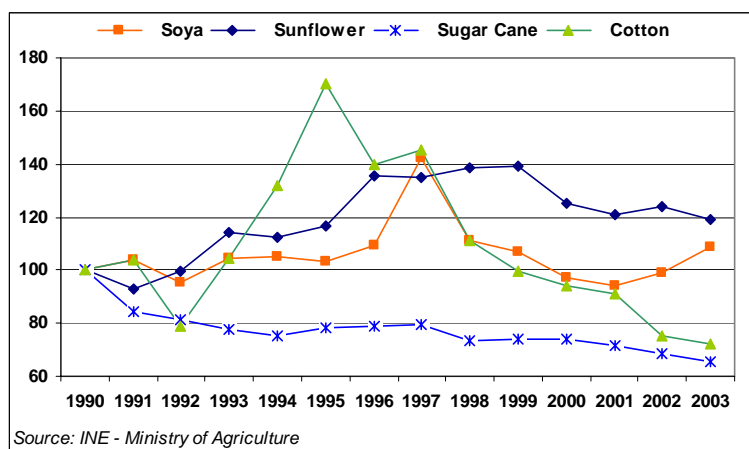
	Farmed Area (hectares)			Crop Share in Farmed Area (percent)		
	1991-1992	1997-1998	2002-2003	1991-1992	1997-1998	2002-2003
Non-Industrial Agriculture						
Maize	281.129	236.200	301.650	20,1%	12,0%	14,7%
Rice	125.013	142.063	142.488	9,0%	7,2%	6,9%
Potato	136.887	131.787	129.500	9,8%	6,7%	6,3%
Wheat	118.350	194.004	103.840	8,5%	9,9%	5,0%
Barley	92.335	84.108	87.730	6,6%	4,3%	4,3%
Banana	51.757	53.309	63.757	3,7%	2,7%	3,1%
Sorghum	25.048	35.543	61.415	1,8%	1,8%	3,0%
Yucca	32.296	33.883	38.963	2,3%	1,7%	1,9%
Quinoa	38.700	37.714	34.480	2,8%	1,9%	1,7%
Broad bean	27.524	27.274	33.200	2,0%	1,4%	1,6%
Alfaalfa	18.871	20.971	27.085	1,4%	1,1%	1,3%
Cofee	22.136	23.601	25.304	1,6%	1,2%	1,2%
Vetch	12.241	13.463	13.776	0,9%	0,7%	0,7%
Tomato	4.348	6.717	10.153	0,3%	0,3%	0,5%
Grape	3.642	3.970	4.898	0,3%	0,2%	0,2%
Industrial Agriculture						
Soya	221.931	588.667	653.220	15,9%	30,0%	31,8%
Sunflower	21.500	143.350	175.000	1,5%	7,3%	8,5%
Sugar Cane	79.835	86.764	105.242	5,7%	4,4%	5,1%
Peanut	10.437	11.048	12.165	0,7%	0,6%	0,6%
Cotton	26.280	50.291	4.040	1,9%	2,6%	0,2%
Coca	45.500	38.000	28.450	3,3%	1,9%	1,4%

Source: Own estimates based on data published by National Institute of Statistics and Ministry of Agriculture

Relative prices movements in agriculture

The trends observed in the allocation of land to the production of different crops have somehow responded to the trends followed by relative price changes. Agricultural prices during the 1990s presented a volatile behaviour. Between 1990 and 1997, crop prices tended to increase strongly. During that period, the economy presented stable growth rates, brought about by a continuous expansion in domestic and external demand. Starting from 1998 however, the domestic and global economy entered into a period of much slower growth, causing agricultural price reductions, both domestically and externally, and bringing about income losses to producers.

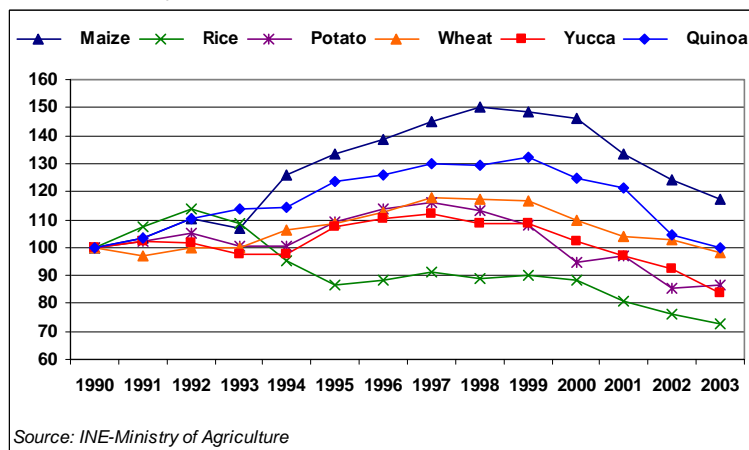
Graph 3
Producer prices of main commercial agricultural products
(Index, base year 1990 = 100)



Producer prices of commercial agricultural products are more sensitive to trends observed in external markets (Graph 3). Between 1990 and 1997, prices of commercial crops presented significant increases, especially in the cases of cotton, that in cumulative terms rose by 45.2%, peanut (31.2%), sunflower (34.9%), and soya (42.5%). Positive conditions

in the world economy favoured this positive trend. These remarkable price increases brought about a substantial expansion in total farmed area allocated to commercial crops, and consequently in output and export volumes. Starting from 1998 however, as the world economic entered a period of slower growth, prices of commercial agricultural commodities plummeted in the world markets. The price of cotton decreased by 50.3% between 1997 and 2003 bringing about a sizable reduction in the farmed area allocated to this crop and causing a substantial reduction in output. Soya and sunflower prices dropped by 23.9% and 11.6% respectively, but there were not equivalent contractions in production as those observed in the case of cotton. Sugar cane was the only industrial agricultural product that presented a constant downward trend during the whole period under analysis.

Graph 4
Producer prices of main non- industrial agricultural products
(Index, base year 1990 = 100)



Prices of non industrial agricultural products are more sensitive to domestic market conditions (Graph 4). However, prices for these products have somewhat tended to follow the same pattern exhibited by the economic cycle during the 1990s and early 2000s. From 1990 to 1999, there was a positive trend in prices of products such as coffee, which price

increased by 58.9% in dollar terms. The price of maize went up by 44.8%, quinoa (30%), wheat (17.6%), potato (16.1%), and yucca (12.2%). Rice is the only product that presented a negative trend in prices starting from the early 1990s.

During the latest years of the 1990s, as the economy entered a period of recession and economic crisis characterized by increased urban unemployment and depressed domestic demand, prices of non-industrial agricultural products experienced significant reductions.

Table 9
Agriculture producer prices

	Producer prices (US\$/ton)			Price variations (percent changes)		
	1990	1997	2003	1990-97	1997-03	1990-03
Non-Industrial Agriculture						
Coffee	629,6	1000,7	744,8	58,9%	-25,6%	18,3%
Quinoa	420,9	547,0	421,2	30,0%	-23,0%	0,1%
Grape	417,8	452,0	368,6	8,2%	-18,5%	-11,8%
Vetch	320,7	364,9	300,9	13,8%	-17,5%	-6,2%
Wheat	172,9	203,3	170,0	17,6%	-16,4%	-1,7%
Broad bean	165,2	176,7	149,5	6,9%	-15,4%	-9,5%
Tomato	174,7	184,6	148,9	5,6%	-19,3%	-14,8%
Potato	166,6	193,4	144,4	16,1%	-25,3%	-13,3%
Maize	120,1	174,0	141,1	44,8%	-18,9%	17,5%
Rice	187,1	171,1	136,1	-8,5%	-20,5%	-27,3%
Barley	161,5	123,8	94,6	-23,3%	-23,6%	-41,4%
Yucca	112,3	126,0	94,2	12,2%	-25,2%	-16,1%
Alfaalfa	79,5	97,7	84,9	22,9%	-13,2%	6,7%
Banana	36,1	41,2	31,8	14,1%	-22,8%	-11,9%
Sorghum	48,9	47,1	30,4	-3,6%	-35,4%	-37,7%
Industrial Agriculture						
Cotton	1305,4	1896,0	942,7	45,2%	-50,3%	-27,8%
Peanut	503,8	660,8	511,0	31,2%	-22,7%	1,4%
Sunflower	133,1	179,6	158,8	34,9%	-11,6%	19,3%
Soya	143,1	203,9	155,2	42,5%	-23,9%	8,5%
Sugar Cane	17,0	13,5	11,1	-20,5%	-17,7%	-34,6%
Coca	526,6	708,2	2492,3	34,5%	251,9%	373,3%

Crop yields

Another important variable that guide land allocation decisions and thus crop production is the monetary yield expected from a given farmed hectare, once the production has been sold in the markets. Monetary yield per hectare for a given crop is determined by the physical production yield per hectare harvested, and the price of that production. Table 10 shows, in the one hand, the land productivity for the various crops produced, expressed in terms of the physical yield per hectare. As it can be observed, there was important productivity gains attained in the production of almost all crops, both industrial and non-industrial. The technological improvements introduced in agricultural activities, especially in the production of commercial crops, explain this positive trend. However, traditional producers also benefited from technological transfers, arising from extension programmes carried out by the government and various NGOs.

Table 10
Yield per hectare by crop

	Tons/hectare			US\$/hectare		
	1991-92	1997-98	2002-03	1991-92	1997-98	2002-03
Non Industrial Agriculture						
Tomato	10,81	12,00	13,31	1939	2141	2481
Yucca	10,05	9,09	10,07	2528	2378	2448
Banana	9,06	9,52	9,83	1151	1155	1040
Alfaalfa	6,22	6,25	6,38	732	895	865
Grape	5,16	5,40	6,22	413	952	780
Potato	4,41	4,48	6,08	558	610	573
Sorghum	3,12	2,73	2,87	380	447	544
Maize	1,53	1,51	2,35	227	224	340
Rice	1,83	2,09	1,91	355	389	335
Broad bean	1,12	1,49	1,78	403	402	299
Vetch	1,19	1,24	1,71	189	287	288
Cofee	0,69	0,95	0,97	191	259	278
Wheat	0,81	0,90	0,85	138	225	120
Barley	0,55	0,68	0,68	144	92	94
Quinoa	0,44	0,54	0,64	73	81	69
Industrial Agriculture						
Sugar Cane	42,69	39,71	46,29	508	736	776
Soya	1,54	1,90	2,37	526	688	630
Peanut	1,00	1,05	1,15	586	507	553
Sunflower	1,37	0,80	1,02	263	437	335
Cotton	0,24	0,40	0,46	356	230	165
Coca	1,76	0,50	0,60	820	291	1827

Source: Own estimates based on data published by National Institute of Statistics and Ministry of Agriculture

Land productivity for industrial crops tended to increase. This, coupled with a more stable behaviour in prices, translated into higher monetary returns per farmed hectare of land. The yield per hectare of land allocated to the production of soya increased from 1.54 tons/hectare at the beginning of the 1990s to 2.37 tons/hectare in 2003. Since soya prices also increased during that period, by 8.5%, monetary yields per hectare of land under soya rose from US\$ 526 to US\$ 630. Different was what occurred in the case of sunflower. The physical yield of land for this product decreased from 1.37 tons/hectare in 1991 to 1.02 tons/hectare in 2003. However, since during this period prices went up by 19.3%, the monetary yield per hectare of land under sunflower increased from US\$ 263 to US\$ 335.

There was a different situation in the case of non-commercial products. Overall, non commercial crops exhibited land productivity increases, which were offset by price reductions. In the case of crops such as potato, barley, rice, wheat and quinoa, there were land productivity gains of varied magnitude. However, since prices for all these products experienced substantial reductions, the monetary yields per hectare produced reduced significantly. Given that the production of non-industrial agricultural crops is aimed principally at satisfying domestic markets, production increases owing for instance to rises in productivity, bring about significant price reductions, due to the narrowness of domestic markets, the low price elasticity of demand for these products, and to the low purchasing

power levels existing among the population. Thus, productivity increases might cause income reduction to producers by depressing prices in the domestic markets.

The only exception to the above mentioned pattern was perhaps the case of maize, which is one of the main crops produced by peasant farmers. The physical yields of this particular crop increased from 1.53 tons/hectare in 1991 to 2.35 tons/hectare in 2003. Likewise, prices went up by 17.5%. As a result, the monetary yield per hectare devoted to the production of maize increased from US\$ 227 in 1991 to US\$ 340 in 2003.

Non-crop agriculture

Non-crop agricultural activities, e.g. cattle breeding and poultry farming, are carried out both, by small-scale peasant type agricultural units and by large-scale business oriented entrepreneurial units.

In most peasant units, non-crop agricultural activities are linked to agricultural activities. They very often constitute a complementary and secondary activity carried out in order to increase monetary incomes to the household. Non-crop agricultural activities constitute an alternative to diversify production and generate income opportunities for small scale producers. Peasant agriculturists have practiced livestock breeding and poultry activities as means to diversify and expand their income opportunities. Very often, stock breeding is complementary to crop growing activities, as is the case of bovine cattle used in land ploughing activities.

Livestock activities

The livestock-rising industry in Bolivia presents favourable conditions for the breeding of cattle linked to the production of meat and other products such as dairy products, leather and wool.

Bovine-cattle raising is primarily done on an extensive basis (5 hectares per head) and subject to economies of scale (access to credit, breeding and marketing). In 2003, the bovine population was estimated at about 6.7 million heads, of which 72% were located in the lowlands, 19% in the valleys and 9% in the highlands regions. In the Beni natural savannas there were about 4,000 ranches, with about 2.6 million head, occupying about 10 to 12 million hectares (average size of ranches: 4 to 5 thousand hectares). Beni ranches hire some 15,000 peons on a permanent live-in basis and a large number of seasonal workers (6 months). In Santa Cruz there are small (smaller than 300 heads) and medium (between 300 to 800 head) ranches. These have 700,000 and 350,000 head. In the Chaco region, there are some 800,000 head in very large ranches (several thousand hectares) that often have conflicts with indigenous communities.

On the other hand, the breeding of bovine cattle in the western highland region is linked to crop agricultural activities, as peasant use animal force in the ploughing of land. Bovine cattle breeding in this region is not directly linked to the production of meat or dairy products. In the valley region bovine cattle breeding is primarily directed to the production of dairy products, in order to satisfy market consumption in the urban areas. Bovine cattle breeding is carried out under diverse modalities, depending on farm size. In small and medium size farms, male animals are utilized in ploughing activities, and female in milk production.

Overall, bovine cattle breeding activities have exhibited a far more stable growth pattern compared to crop agricultural production (Table 11). However, due to existing constraints, growth of bovine population has been very low in the last decade (about 1.3% a year on average). Meat production has presented very low growth rates, averaging only 2.7% a year. Price trends were not favourable either, since they presented a downward trend. From 1997 to 2003, prices of bovines decreased by an average rate of -5.4% a year.

Ovine-cattle breeding is practiced by a large number of peasants in the highlands and valley regions. These activities represent an important subsistence means to poor rural households, both as a source of meat and wool, as well as a source of monetary income or as commodity utilized in bartering. However, wool and meat yields are very low, making sheep breeding activities very unprofitable and secondary. The constraints that limit sheep breeding activities affect the quality of meat and wool production, presenting serious deficiencies due to the absence of adequate selection procedures, widespread premature pregnancies, frequent birth giving, and excessive consanguinity. Furthermore, there is lack of adequate infrastructure, sanitary controls, and insufficient supply of water and fodder. As a consequence, ovine cattle is affected by high mortality rates of litter, genetic malformations, and eventually low yields of meat and wool.

Table 11
Livestock Production

				Growth rates (annual average percent changes)		
	1992	1997	2003	1992-97	1997-03	1992-03
Livestocks (heads)						
Bovine	5.779.281	6.237.821	6.695.909	1,5%	1,2%	1,3%
Ovine	7.472.415	8.232.034	8.575.968	2,0%	0,7%	1,3%
Porcine	2.225.550	2.568.768	2.924.687	2,9%	2,2%	2,5%
Camelidae	1.691.144	1.883.764	2.117.010	2,2%	2,0%	2,1%
Meat production (tons)						
Bovine	126.087	147.250	168.159	3,2%	2,2%	2,7%
Ovine	12.850	14.638	17.555	2,6%	3,1%	2,9%
Porcine	44.260	57.977	72.901	5,5%	3,9%	4,6%
Camelidae	1.991	2.444	3.016	4,2%	3,6%	3,8%
Prices (Us\$/head)						
Bovine	178	189	136	1,2%	-5,4%	-2,5%
Ovine	7	7	5	1,0%	-4,7%	-2,2%
Porcine	32	37	27	2,8%	-5,0%	-1,5%
Camelidae	20	18	13	-1,8%	-5,7%	-3,9%

Source: Own estimates based on data published by Muller & Asociados

The constraints caused that the ovine population presented very low growth rates, averaging 1.3% a year during the period 1992-2003. By 2003, the estimated sheep population in the country was 8.6 million heads. Ovine meat production also presented low growth rates, averaging 2.9% a year during the same period. Price trends were also unfavourable to ovine

cattle breeders, as they presented decreasing rates averaging -2.2% a year during the 1992-2003 period.

Porcine cattle breeding is carried out mainly in the Chuquisaca region. Average consumption of pork meat is relatively low in Bolivia. Low availability of pork meat in local markets is caused by commercialization problems, due to the large physical distances that separate producers from consumption markets. However, Bolivia has large potentials to develop porcine breeding activities, including industrialization.

Camelidae cattle breeding is mostly carried out in the western highlands. In 2003, the total camelidae population, including llamas and alpacas, was estimated at 2.1 million heads. Camelidae cattle breeding is carried out by peasant type productive units. The breeding systems utilized do not include modern technologies. Llama and alpaca breeding is traditional and extensive, existing serious shortages in the availability of breeding infrastructure. Camelidae cattle breeding activities in Bolivia are characterized by low yields in the production of meat and wool, and high rates of mortality. Both aspects are linked to the insufficient availability of food, and a high incidence of infectious and parasitical diseases. However, there is an interesting potential to develop camelidae cattle breeding as a means to increase employment and income opportunities for the poorest segments of the Bolivian rural population. In 2003, the country exported about US\$ xx million in textile products, made out of llama and alpaca wool. Nowadays, llama and alpaca breeding represents the main subsistence means to the poorest segments of the rural population (about 45.000 families), in the depressed highland areas.

Poultry activities

Poultry farming activities, including the breeding of birds such as chicken, ducks turkeys, etc. are carried out both, by peasant type agricultural units and specialized modern industrial enterprises. Poultry farming is linked to agricultural activities in almost all peasant units. They constitute a complementary and secondary activity carried out in order to increase monetary incomes and food supply to the household.

On the other hand, the poultry industry, as a separate activity from agriculture, is specialized in the production of chicken meat and eggs. These types of industrial activities have experienced an important expansion during the period 1992-2003. The annual average growth rate of chicken production during this period was 7.4%. The production of eggs also expanded significantly, growing at a rate averaging 5.2% a year. Overall, industrial poultry farming has exhibited satisfactory efficiency levels due to an adequate modernization of its production processes. Cochabamba and Santa Cruz are the regions where modern poultry farms have attained an important development.

Table 12
Production of Poultry Products

	Annual Production (millions)			Growth rates (annual average percent changes)		
	1992	1997	2003	1992-97	1997-03	1992-03
Chickens	33	60	73	12,6%	3,3%	7,4%
Egs (units)	492	671	860	6,4%	4,2%	5,2%

Source: Own estimates based on data published by Muller & Asociados

Agricultural growth and the poor

The analysis above clearly shows that although the agricultural sector has exhibited some positive growth in the last decade, it has not benefited the poorest segments of workers engaged in agricultural activities. In a first place, agricultural growth was basically explained by the good performance of agro-industrial activities, which produce mainly to satisfy export markets. Agricultural output growth during the 1990s was basically owed to the significant output increase of commercial crops, such as soya and sunflower, led by a strong expansion of exports, either as raw material or industrially processed products. Conversely, non-commercial agricultural activities, mainly produced by traditional peasant units, remained largely stagnated. Output growth was very limited for most of the non-commercial crops, such as maize, potato, wheat, rice and barley, that together comprise 70% of the total farmed area of non-industrial agricultural crops.

Table 13
Labour Productivity and Employment Intensity
in Agriculture

Agricultural Activity	Annual Labour Productivity (MT per workers)		Labour Intensity (workers/hectare)	
	1999	2002	1999	2002
Industrial Agriculture	234,7	162,5	24	40
Soya	337,2	236,1	5	8
Sugar Cane	310,0	294,8	131	157
Sunflower	338,1		3	
Peanut	2,4	0,8	459	1.384
Non Industrial Agriculture	2,1	1,9	1.080	1.361
Maize	2,4	3,4	763	636
Potato	1,1	1,3	4.998	4.874
Rice	2,8	2,1	499	739
Wheat	34,8	1,7	25	529
yucca	30,8	8,7	317	1.159
Barley	54,1	0,6	13	1.149
Coca	1,6	1,0	648	815

Source: Own estimates based on National Accounts, Household Surveys and Muller & Asociados

Second, the analysis of land allocation to various crops shows that there has been increase in the shares of land under soya, and sunflower and a decrease in the shares of land under maize, wheat and potato. However, these substantial changes in land allocation between crops have not had equal implications for overall labour requirements. The production of commercial crops did not require labour input in large amounts (Table 13). Overall, the labour input per hectare coefficient for commercial agriculture is only between 2% to 3% the value of this coefficient for non commercial agriculture, because these activities are more capital intensive. Thus, employment share of industrial agriculture was only about 1% to 3% of total agricultural employment (Table 14).

Third, agricultural price movements did not favoured non-industrial crop producers, as prices experienced significant reductions in real terms, during the period under analysis. As poverty is higher amongst such farmers, it is clear that price changes have actually worsened their situation while the commercial farmers have gained from price movements. Likewise, monetary yields of non-industrial crops also have not helped the poorer farmers.

Fourth, although physical yields for both, industrial and non-industrial crops tended to increase during this period, owing to technological improvements, significant price reductions tended to depress monetary yields per hectare in the case of non-industrial crops, depressing in turn monetary incomes of non-commercial crop producers. Price reductions, in the case of non industrial crops, were sometimes associated to productivity and output increases. The existing low purchasing power and narrowness in domestic markets of food, where non-industrial agricultural production is mainly sold, make demand to be highly inelastic to price changes. Thus, an increase in output tends to depress prices total therefore incomes of producers.

Fifth, since the growth patterns observed in agriculture did not benefit the poor, poverty incidence in the rural area stood at high levels. However, rural workers were affected differently by these observed trends. Poverty incidence was much higher for agricultural workers engaged in the production of non commercial crops. Poverty incidence was 85.5% in 1999 and 90.2% in 2002. Poverty incidence among producers of commercial crops was 67.2% and 62.1% in 1999 and 2002 respectively (Table 14). In non-commercial agriculture, poverty incidence was very high among producers of almost all non commercial crops. In 2002, poverty incidence among maize producers was 84.3%, potato (91.5%), wheat (94.5%) and barley (93.4%). Only coca producers were affected by a lower poverty incidence (69.2%).

Table 14
Employment and Poverty Incidence in Agriculture
(percent of total workers)

Agricultural Activity	Employment		Poverty Incidence	
	1999	2002	1999	2002
Soya	0,2%	0,4%		28,6%
Sugar Cane	0,8%	1,1%	55,4%	52,2%
Sunflower	0,0%	0,0%		
Peanut	0,4%	1,1%	97,5%	82,8%
Industrial Agriculture	1,4%	2,6%	67,2%	62,1%
Maize	14,8%	13,3%	85,8%	84,3%
Potato	46,5%	42,7%	88,7%	91,5%
Rice	6,6%	6,5%	65,0%	87,9%
Wheat	0,3%	4,7%	93,3%	94,5%
yucca	0,8%	3,1%	60,5%	87,8%
Barley	0,1%	6,8%	100,0%	93,4%
Coca	1,0%	1,3%	60,4%	69,2%
Non Industrial Agriculture	70,1%	78,4%	85,5%	90,2%
Ovine	14,2%	3,2%	92,6%	94,1%
Bovine	4,7%	3,2%	57,7%	54,7%
Porcine	0,6%	0,7%	93,8%	85,0%
Camelidae	2,0%	1,9%	96,9%	92,2%
Livestock breeding	21,5%	9,0%	84,3%	79,1%
Other activities	6,9%	10,0%	77,0%	76,4%
Other crops	4,4%	7,8%	74,4%	75,1%
Other livestock	2,5%	2,2%	81,6%	80,7%
Total	100,0%	100,0%	84,5%	86,8%

Source: Own estimates based on 2002 Household Survey

Finally, poverty incidence of workers in livestock was also high (79.1% in 2002). However, poverty incidence of workers in bovine cattle breeding was much lower than that of workers in other livestock activities (54.7%). As explained before, the breeding of bovine cattle is mostly carried out on an extensive basis and subject to economies of scale (access to credit, breeding and marketing). These factors make labour productivity much higher and generate better income returns to workers engaged in the extensive and more modern breeding activities. Conversely, the breeding of ovine, porcine and camelidae cattle is carried out by traditional peasant agricultural units, and are affected by low productivity, owing to the lack of adequate infrastructure and technology, absence of sanitary controls, insufficient supply of water and fodder, and narrowness of markets. Low productivity causes lower income level to producers and therefore a higher poverty incidence among them.

4. Diversification of Rural Livelihoods

Agriculture is the single most important sector of the Bolivian economy in terms of employment generation. However, poverty incidence among agricultural workers is the highest in the country. Even productivity increases due to technological improvements, that should have produced better incomes to non-commercial crop producers, have caused monetary income losses to agricultural producers due to the low purchasing power and narrowness existing in domestic markets. Therefore, it is necessary to expand access to markets for agricultural producers as a means to improve income opportunities to the poor. This has to be accompanied by a structural transformation of the agricultural sector in Bolivia, in order to increase agricultural and rural productivity.

From the point of view of reducing poverty in rural Bolivia, it would be important to achieve a structural transformation of employment from low productivity agriculture to sectors with higher productivity. And in that respect, diversification of the sources of livelihood will be important. Rural non-farm activities can be important in that regard. But it would be important to distinguish between those activities that act basically as last resort type of employment, and those that are characterised by higher productivity (than, for example, in agriculture and in residual type activities) and a potential for growth. The focus of a pro-poor growth strategy would be the latter; and an attempt will be made to identify some such activities and analyse the factors that hinder the poor people from getting into them (either as an entrepreneur or as a wage labourer).

Government strategies for the development of the agricultural sector

Different governments have put forward strategies tending at promoting growth and development in the agriculture and rural sectors. In 1996, the government unveiled the Strategy for the Productive Transformation of Agriculture (ETPA). The strategy envisaged agriculture as the main engine that would promote overall economic growth and development. ETPA was basically based on the idea that the Bolivian agricultural sector, and in more general terms the rural sector as a whole, suffers from a widespread low productivity. This in turn, explained low income levels and therefore a high poverty incidence among urban workers. Besides, low incomes and high poverty incidence caused rural-urban migration, contributing to increase urban marginality. Thus, ETPA proposed as an overall strategy conduct policies aimed at increasing productivity in rural activities, both agricultural and non-agricultural. ETPA identified five areas in which additional efforts needed to be carried out in order to attain this broad objective. These areas were: i) increase efficiency of public investment in education and technical training in order to strengthen human capital; ii) promote agricultural technology research and extension programs to benefit peasant producers; iii) increase investment in agricultural infrastructure, mainly in local roads and irrigation systems, and gathering infrastructure; iv) promote a sustainable use of natural resources; and v) improve rural credit systems. ETPA was criticized on the grounds that it was too much supply-led oriented and did not put emphasis in expanding access to markets, both domestic and foreign. It was argued that the strategy oversaw the fact that substantial increases in productivity might produce production surpluses that could not be absorbed by markets, thus leading to price reductions and therefore to income losses, causing poor peasant producers to be worse-off. Therefore, any strategy devised to increase productivity had to be accompanied simultaneously by a complementary strategy aimed at increasing access to market, both domestic and foreign.

In 2003, other government presented a new strategy for rural and agricultural development known as ENDAR (National Strategy for Agricultural and Rural Development). ENDAR approach to rural and agricultural development was based in seven strategic policies: i) promote the living conditions development of peasant and indigenous people; ii) promote productivity and competitiveness development of rural productive units; iii) guarantee food security; iv) generate income opportunities in non-agriculture rural sectors; v) improve and enlarge rural productive infrastructure; vi) improve access to productive land; vii) and promote alternative development.

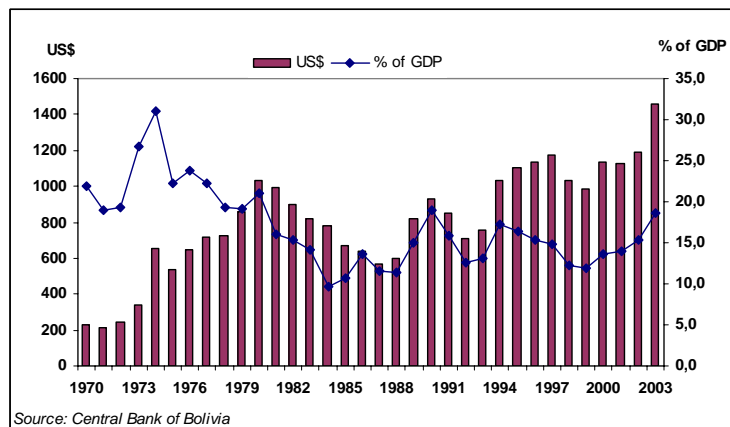
ENDAR retained various concepts that ETPA had already put forward, especially those referred to the productive restructuring and transformation of rural activities. However, ENDAR has taken a more demand driven approach, highlighting the need to concentrate efforts and resources in expanding access to foreign and domestic markets. According to ENDAR, market preferences have to play a greater role in determining the required productive transformation to be undertaken in rural and agricultural activities. Thus, public investment ought to accompany and promote this productive transformation. Additionally, ENDAR proposes setting up a system aimed at assessing public investment efficiency, in terms of its contribution to the strategy's main goals.

Market integration and the development of productive chains and clusters

A major constraint that hampers growth and development in both, traditional peasant agriculture in rural areas is the lack of greater integration to markets, both domestic and external. However, domestic markets have demonstrated to be far too narrow and purchasing power of local consumers too reduced, contributing both aspects to perpetuate poverty. As it was discussed previously, under these conditions, an increase in supply of agricultural products for instance, due to an increase in productivity, tends to generate excess supply of products in domestic markets, bringing about price reductions and therefore bringing about income losses to small scale producers. Thus, if access to market is not simultaneously guarantee, any strategy aimed at increasing productivity in agricultural or small scale producers in urban areas, might contribute to increase poverty instead of reducing it, causing a completely reverse effect than the initially intended.

A sensible strategy would be to promote export oriented productive clusters, which would have the greatest impact in integrating poor small scale producers along the productive chain. There is not to much opportunity that a country with the characteristics of Bolivia—i.e. a population of 9 million people and a per-capita income below US\$ 1.000—had attained fast economic growth and development focusing only on its domestic markets. However, Bolivia's export performance has been quite poor in the past.

Graph 5
Bolivian Exports



In the last two decades, i.e. from 1980 to 2003, exports have only increased by 40%, representing an average annual growth rate of only 1.5% a year. Exports, as a share of GDP have reduced from 21.1% in 1980 to 18.6% in 2003. In 1973, exports' share in GDP was as high as 31%. Additionally, Bolivia has not diversified its exports, in terms of products exported nor in terms of target markets

for its exports. Between 1980 and 2003, ten products have comprised more than 80% of Bolivia's export incomes, as it can be seen in Table 15. Natural gas alone has comprised more than 20% of exports in the three selected years presented. Soya and soya by-products have become important during the 1990s.

Table 15
Export Diversification

Share of 10 main export products in total exports (percentage)

	1980	1990	2003
Tin	36,5	11,5	5,0
Silver	11,4	5,5	5,1
Zinc	3,5	15,8	8,5
Gold	0,0	7,0	4,9
Natural Gas	21,3	24,3	26,1
Petroleum	0,0	0,0	6,5
Soya and by products	0,6	5,2	21,0
Sugar	4,9	3,4	1,5
Wood	3,0	5,4	1,8
Cattle	0,1	5,3	0,0
Total	81,4	83,4	80,5

Source: Central Bank of Bolivia

Share of export markets in total exports (percentage)

	1980	1990	2003
Mercosur	27,0%	33,2%	33,7%
Andean Region	3,6%	6,0%	25,8%
Chile	4,1%	3,5%	2,6%
NAFTA	29,9%	19,4%	15,9%
European Union	32,2%	27,8%	6,7%
Asia	0,9%	0,3%	4,1%
Switzerland	4,6%	2,1%	10,1%
Rest of the World	6,7%	7,7%	1,2%
Total	100,0%	100,0%	100,0%

Source: Central Bank of Bolivia

Besides, Bolivia has not diversified its export markets either. In 2003, the bulk of exports were directed to Mercosur (natural gas) and to the Andean Countries (soya). Exports to NAFTA countries were also important (minerals). However, there are markets that remain completely unexploited, like Asia, Chile and the European Union.

Thus, it is important to identify new export sectors with the potential of having a more important impact in terms of job creation. These sectors should be the basis for the development of clusters around these specific productive chains. In order to identify the job creation impact of sectoral exports, Table 16 presents the employment effect of exports carried out by different productive sectors. The export multiplier effects on employment were calculated based on a fixed-price multiplier model (Candia 2002). The fixed-price multiplier model utilized to calculate the employment effects of sectoral exports was based on a Social Accounting Matrix for Bolivia calculated for the year 1998. Therefore, the figures presented reflect the degree of integration existing in the Bolivian economy in that particular year. Thus,

if a greater integration develops between sectors in the future, for instance through a larger cluster development, the value of the multipliers would be greater.

The figures presented show that the largest employment effect come from exports of non industrial agricultural products, due to the large share of workers employed in that activity. Table 16 shows that an increase in exports of non industrial products of about one million dollars, will create 1,393 new jobs, both in the agriculture sector and in the rest of the economy, through the multiplier effect. Exports of livestock can also be important in promoting job creation. In the manufacturing activities, the most important sector in terms of job creation is the processed-food industry. Other sectors with interesting potential of creating jobs are the production of processed wood and wood products; and the manufacturing of textiles. Although it is considered a non tradable activity, the service sector represents another important alternative to promote employment creation. As mentioned before, tourism development could be a very interesting alternative with important effect in creating jobs that would benefit the poor.

Table 16
Employment Multiplier Effects of Sectoral Exports

	Total Employment (thousand workers)	Total Production (Million US\$)	Employment /Production Coefficient (workers/ million US\$)	Employment Multiplier of Final Demand (workers/ million US\$)
Tradeable Sectors				
Non Industrial Agricultural Products	1071	619	1731	1393
Industrial Agricultural Products	24	335	70	223
Livestock	329	398	826	1045
Forestry, hunting and fishing	15	86	173	295
Hydrocarbons	2	256	8	79
Mining	45	391	115	174
Food Industry	87	1464	60	571
Textiles	174	573	304	370
Wood and Paper Industry	72	291	248	395
Chemical Products	4	123	30	108
Petroleum Refineries	1	379	3	90
Non-metallic Mineral Products	31	169	185	270
Basic Metals	3	106	25	72
Machinery and Equipment	25	71	357	65
Other Manufactures	18	77	233	179
Electricity, Gas and Water	8	287	28	85
Non-tradeable Sectors				
Construction and Public Works	213	543	392	458
Commerce	512	959	534	
Transport, Storage and Communication	181	1453	125	183
Financing Services	18	417	42	293
Services to Firms	75	350	214	260
Other Services	474	1389	341	463
Government Services	243	1093	223	302
Total	3624	11829	306	

Source: Own estimates based on data published by Candia (2002)

The promotion of labour intensive exports, would be an alternative to increasing access to markets for small scale producers. Although it difficult that small scale producers can have access to external markets by themselves, they should be integrated as suppliers of intermediate inputs along the various stages of a given export oriented productive chains or cluster. In this way, the problem of narrowness and low purchasing power existing in domestic markets, could also be overcome. The most illustrative case in Bolivia on how integration of small scale producers into productive clusters can help reduce poverty, is the case of the soya cluster in the Santa Cruz department. The production of soya and soya-based products is mainly sold in external markets. Exports and production are basically organized by large corporations, which participate in all stages of the production chain, and especially in its latest stages, which comprise the industrial transformation of soya and its export to foreign markets. However, along the whole productive chain there are several small scale producers integrated in this process. For instance, there are about 14.000 small-scale soya producers that sell their production of soya beans to larger corporate firms. The soya small-scale producers are better-off in terms of incomes compared to agricultural economic units that produce mainly for domestic consumption markets. Thus, a greater emphasis should be placed on promoting the development of productive export chains or clusters, and to promote the integration of small scale producers to them. Examples of productive sectors that have the potential to developed into more dynamic, export oriented productive chains and clusters are: tourism, wood industry, quinoa, textiles, leather industry, and the grape and wine industry.

Productive chains in the agricultural sector

One factor that determines competitiveness in the agricultural sector is the degree of cluster development around determined productive chains. In the Bolivian agricultural sector, there are a number of activities where productive chains or clusters have developed over time, although with different degrees of evolution. The most developed, integrated and sophisticated clusters are those that have developed around export productive activities, such as soya, sunflower, grapes, wood, wool and lather.

ENDAR also contemplate cluster development as paramount in terms of increasing productivity and competitiveness in agricultural and non-agricultural rural activities. The Bolivian Poverty Reduction Strategy (BPRS) unveiled in 2003, stressed the need to articulate cluster-specific Agreements for Policy Action. Formally, agreements are signed by government representatives, private associations, and participating firms. These agreements record generalized obligations and recognition of sectoral problems. They have no legal force, but they express common understandings and commitments to work together. They establish an institutional vehicle for dialog, communication and follow-up, with the idea that Government and private firms can work together to improve productivity (World Bank, 2005).

Export oriented cluster exhibit greater vertical integration along the productive chain, participating in this process small scale producers as well as large scale corporate economic units. Overall, firms engaged in the early stages of the productive chain are micro to small scale units, which are basically engaged in activities related to the production of basic raw materials, such as wool, soya beans, grape fruit, wood, quinoa grains, etc. These basic products are transformed into more value-added products, in later stages of the productive chain. There are some intermediate activities within the productive chain, carried out by small to medium scale economic firms, performing a varied number of processes, such as seasoning, sawing, selecting, drying, storing, tannery etc. Finally, at the end of the productive

chain, there are the large scale corporate enterprises that perform the industrial transformation of production and sell final products to domestic and external markets, such as oil, soya flour, soya cakes, furniture, leather products, textiles, wine, etc.

Depending on the degree of cluster development, there exist institutional and service networks that support production, such as technology development and extension institutions, financial and insurance services, training centers, transport infrastructure and services. Most developed clusters have also created strong entrepreneurial or producer association that protects the sector's interests. Cluster development plays a key role in increasing sectoral productivity and competitiveness.

There is a potential in Bolivia to promote a greater cluster development for a number of key productive sectors, as a means to improve competitiveness, through incorporating more technology in their productive process, and attaining better integration within export productive chains. Cluster development would create more stable and productive employment opportunities for the poorest segments of society, and guarantee a more sustainable growth in real incomes. Economic authorities in Bolivia are trying to promote cluster development, as an effective means, not only to expand and diversify exports, and make the economy less vulnerable to external shocks, but also as a means to create employment and income opportunities for the poor, and thus attain effectively poverty reduction objectives.

At presents, soya cluster constitutes perhaps the most develop and consolidate productive cluster in the country. Although this cluster has developed thanks to the leading role played by corporate firms, which actually run the soya industry and export business, the production of soya comprises the participation of a large number of small scale producers that sell their output to industrial processing plants (see Annex C). The bottom-line idea is that the soya cluster development was mostly demand driven, rather than supply led. The existence of export markets and export firms determined to take advantage of those markets opportunities, opened employment opportunities to a large number of workers, not only in the industrial and export firms themselves, but also in several small scale units that supply inputs to large firms.

Productive clusters of non-industrial crops primarily aimed at satisfying domestic market demand, have not attained an equivalent degree of development and sophistication, as in the case of soya. Production and marketing of traditional products such as potato, maize, quinoa (see annex C), etc. are carried out through not well developed productive process. They do not also benefit from adequate service support networks, such as financial services, technology transfer, transport and storage services, access to market information, etc. Thus, the policy recommendation is to promote export cluster development around productive chains that have the potential to successfully compete in external markets, generate employment and import opportunities for the poor.

In Annex C, a more detailed analysis is carried out about two key agro-industry productive clusters existing in the Bolivian economy. The analysis tries to identify the main causes that have favored or hampered cluster development potential in each of these sectors. First, the soya cluster is analyzed in a detail fashion. As it was said before, this cluster is perhaps the most developed existing in the Bolivian economy. Although it comprises mostly corporate enterprises and its production is aimed mainly to export markets, it also generates employment opportunities for a large number of poor small scale producers engaged in the early stages of the productive chain. Second, the analysis concentrates on the quinoa cluster. This cluster is far less developed compared to that of soya. Quinoa producers do not benefit

from a system of supporting service to their production. Soya production is mainly aimed at satisfying self consumption and producers are amongst the poorest segments of Bolivian workers. However, there can be room for income and employment improvements in this sector, if exports are expanded.

5. Urban Micro- and Small-scale Enterprises

Studies on the Bolivian urban labour market (Lay and Wiebelt 2001) usually differentiate between five sectors: the public sector, corporate businesses, semi-businesses, family businesses, and the domestic service sector. The so-called urban informal sector (UIS) comprises the semi- and family-businesses sectors. The semi-businesses sector is characterized by the participation of the owner in the production process instead of delegating these functions to salaried personnel. In family businesses, work is organized exclusively around an independent worker, who carries out an activity with or without the help of family members. In some cases, domestic services are also considered informal. The formal sector includes business and the public sector.

Table 17
Urban employment and Average Incomes

	1999	2000	2001	2002	2003
Share in total workers (%)					
Domestic	3,0	4,2	5,1	3,9	4,1
Public	10,3	10,7	11,4	10,7	9,7
Family	47,9	48,3	47,2	46,5	48,9
Semi-busines	15,4	12,6	14,1	17,6	16,5
Business	23,4	24,2	22,2	21,3	20,9
Average monthly income of workers (Bs.)					
Domestic	534	591	594	687	445,4
Public	1.417	1.513	1.731	1.759	1707,8
Family	668	624	520	700	557,4
Semi-busines	1.006	868	863	990	848,1
Business	1.644	1.880	1.522	1.769	1523,1

Source: Household surveys-National Institute of Statistics

Household survey data shows that the urban informal sector in Bolivia—without including domestic services—comprises between 60% and 65% of urban employment. In 2003, family based informal firms comprised 48.9% and semi-businesses 16.5% of total urban employment (Table 17). The importance of UIS firms has slightly increased in the last few years, rising from 63.3% in 1999 to 65.4% in 2003. Incomes earned by urban informal workers tend to be much lower than formal workers, while those working in semi-businesses firms tend to earn higher incomes than family workers.

Urban informal workers are mostly employed in low productivity micro and small-scale enterprises. According to Table 18, in 1999 firms of this size comprised 87.8% of urban employment and only 28.2% of total GDP. Large enterprises, employing 50 or more workers, comprised only 8.7% of employment but contributed with 65.3% of total GDP. Thus, labour productivity of larger firms was 25 times greater than labour productivity in micro enterprises and 12 times greater than in small scale firms. According to the World Bank (2005), Informal Enterprises are less productive because they have less fixed assets, older technology. Besides,

they operate outside the law, thus they can not obtain favourable credit terms nor take advantage of institutions that facilitate enterprise growth and allow firms to achieve economies of scale.

Table 18
Contribution of Companies to GDP and Employment, by Size
(1999)

Size of Firms (number of employees)	Output (% of GDP)	Employment (Thousands)	Employment (% of total)	Productivity (in 000 of Bs.)
Micro (1 to 9)	25,5	2.984	83,1	4,0
Small (10 to 19)	2,7	170	4,7	8,0
Medium (20 to 49)	3,3	123	3,4	13,0
Large (larger than 50)	65,3	312	8,7	101,0
	3,2			
Total	100,0	3.589	100,0	13,0

Source: World Bank 2005

In 2001, the Ministry of Labour, Cooperatives and Micro-enterprises, surveyed 285.169 economic units in the 34 most important urban centres across the country, including the nine capital cities of departments plus the city of El Alto. Out of the total economic units surveyed, 91% responded to questions on activity and production characteristics, such as: number of workers employed, quantities produced, technology utilized, investment, etc. The following sections analyse the structure of the urban informal sector in Bolivia based on the data obtained through this survey and other household surveys.

Table 19
Distribution of firms by size and sector of activity

	Micro- and small scale			Micro- and small scale		
	1 to 19 workers	more than 20 workers	Total	1 to 19 workers	more than 20 workers	Total
Manufacturing	97,5%	2,5%	100,0%	10,6%	10,7%	10,6%
Services	97,6%	2,4%	100,0%	23,8%	23,8%	23,8%
Commerce	99,2%	0,8%	100,0%	61,9%	19,7%	60,9%
Others	76,5%	23,5%	100,0%	3,7%	45,7%	4,7%
Total	97,6%	2,4%	100,0%	100,0%	100,0%	100,0%

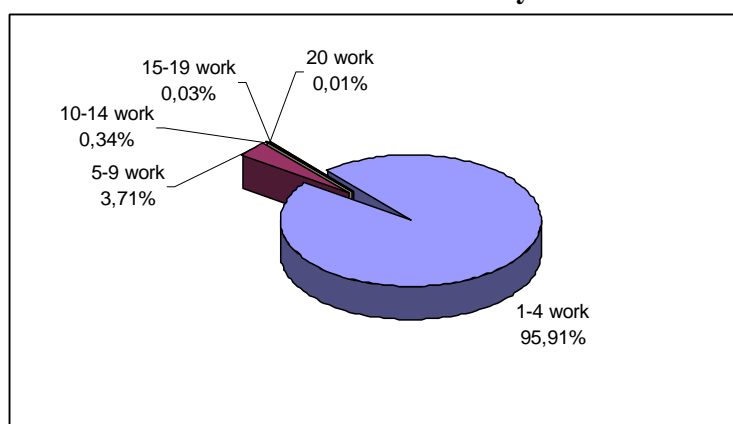
Source: Survey carried out by the Ministry of Labour, Cooperatives and Micro-enterprises (2001)

Of total units surveyed, for which data was available, 97.6% were micro- and small-scale firms, employing less than 20 workers (Table 19). Thus, only 2.4% of firms employed more than 20 workers. Micro and small-scale firms were mostly concentrated on manufacturing, services and commerce activities. There was a larger share of medium- and large-scale firms in other activities, such as mining, construction, hydrocarbons, transport, etc. The bulk of micro and small enterprises were engaged in commerce (61.9%) and services (23.8%) activities. The low start-up levels of capital and skills required in informal commercial and service activities, explain the preference of informal workers to seek employment and income opportunities in these sectors. An important share of medium and larger firms (56.4%) tends

to perform their activities in sectors—including manufacturing—others than service and commerce.

Seventy-six percent of total micro- and small-scale firms surveyed were considered establishments, i.e. occupying an exclusive local or part of a dwelling. Twenty-two percent of small and micro units operated in fixed or mobile stalls or as mobile vendors. This put in evidence the heterogeneity of micro and small-scale firms, as more than two thirds of the activities performed by this type of firms required significant amounts of investments, in order to buy or rent a location, or transform the own dwelling for the business purposes. The foregoing shows that self-employment can not always be regarded as a free-entry sector of the informal economy.

Graph 6
Distribution of micro- and small firms by size



Graph 6 shows that there is a large predominance of the smallest sized economic units among micro- and small scale firms. Units employing less than 10 workers, including the owner of the firm, comprise 99.7% of total micro- and small-scale enterprises. Firms employing between 1 to 4 workers comprises 95.9% of total micro- and small-scale firms. The largest shares of

enterprises employing less than 10 workers are those engaged in commerce (100%), services (97.1%), and manufacturing (92.8%) activities.

Employment in micro- and small scale firms

Urban employment is more diversified than rural employment. According to household survey data, in 2002 agriculture comprised more than 80% of total rural workers. However, there still exists a large concentration of urban workers in few activities. Table 20 shows that 25.1% of total urban workers were employed in commerce, 18.9% in the manufacturing industry, 8.4% in the construction sector, 8.1% in hotels and restaurants and 8% in transport and communication.

Urban workers are largely employed in small scale firms. In 2002, 84% of urban workers were employed in micro and small scale enterprises, and 67.2% in firms employing between 1 to 4 workers. Most workers employed in micro- and small-scale units (less than 20 workers) are engaged in commerce and other service activities. This category embraces a wide range of activities carried out by petty traders, street vendors, repair shop workers, etc. The second most important activity where workers employed in micro- and small-scale firms are involved is the manufacturing sector. In 2002, manufacturing activities employed 19.5% of workers occupied in micro- and small-scale firms. Other important sectors in terms of urban employment were hotels and restaurants (9.3%), construction (9%) and transport (7.8%).

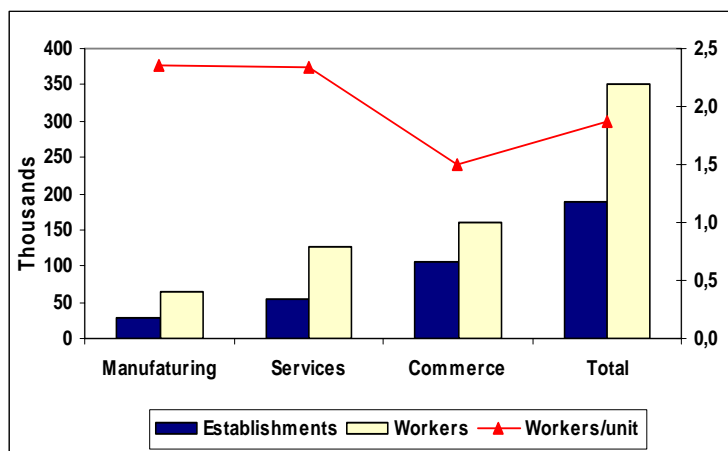
Table 20
Employment Composition per Size of Economic Unit and
Economic Activity
Year 2002

	Size of economic unit				Total Firms
	1 to 4 workers	5 to 19 workers	Micro- and small-scale 1 to 19 workers	Midium- and large- scale 20 + workers	
Agriculture and forestry	7,6%	6,7%	7,4%	3,4%	6,8%
Mining and hydrocarbons	0,1%	1,0%	0,3%	5,0%	1,0%
Manufacturing industry	19,2%	20,5%	19,5%	15,9%	18,9%
Electricity, gas and water	0,0%	0,3%	0,1%	1,8%	0,4%
Construction	7,7%	13,8%	9,0%	5,4%	8,4%
Commerce and other services	32,7%	13,0%	28,7%	5,1%	25,1%
Hotels and restaurant	9,9%	6,8%	9,3%	1,4%	8,1%
Transport, storage and communication	8,0%	6,8%	7,8%	9,1%	8,0%
Financial intermediation	0,1%	1,5%	0,4%	2,7%	0,8%
Business services	3,4%	4,8%	3,7%	4,3%	3,8%
Public services	0,5%	3,2%	1,1%	11,2%	2,6%
Education	0,7%	10,1%	2,6%	23,6%	5,9%
Social and health services	1,7%	3,2%	2,0%	6,4%	2,7%
Community and personal services	5,0%	6,9%	5,4%	4,7%	5,3%
Domestic services	3,0%	0,5%	2,5%	0,0%	2,1%
Others	0,1%	0,7%	0,2%	0,0%	0,2%
Total workers per size of unit	100,0%	100,0%	100,0%	100,0%	100,0%
Share in total workers	67,2%	17,3%	84,5%	15,5%	100,0%

Source: Own estimates based on 2002 Household Survey

By definition, micro- and small scale firms tend to be small, considering the number of workers employed per firm. According to data from the firm survey carried out by the Ministry of Labour, in Bolivia, the average number of workers employed in micro and small enterprises is only 1.87.

Graph 7
Sectoral distribution of micro and small scale firms and employment



Enterprises operating in manufacturing and service sectors tend to be larger than firms operating in commercial activities. Firms operating in manufacturing and services are larger in size, employing on average 2.36 and 2.33 workers per firm respectively. On the other hand, firms in commerce activities are smaller, since the average number of workers per firms is only 1.5. Overall, manufacturing activities

carried out by micro- and small scale firms tend to be relatively more capital intensive than those operating in commerce and service sectors. The small size of firms inhibits the division of labour and workers' specialization, thus restricting any increase in labour productivity. Therefore, output growth can only be induced by an increase in the number of working hours.

Poverty is deeply entrenched among workers employed in micro- and small-scale firms. According to 2002 household survey, poverty incidence was as high as 84.5% among workers occupied in firms of this size. On the other hand, only 26.2% of workers occupied in firms larger than 20 workers were considered as being poor. Poverty incidence is high among urban workers employed in micro- and small scale enterprises. However, the highest poverty incidence affect those workers engage in agricultural activities (70.4% of poverty incidence). Other sectors where poverty incidence is also high are: manufacturing (59.4%), construction (58.3%), and community and personal services (51.2%).

Table 21
Poverty Incidence in Workers per Size of Economic Unit and
Economic Activity
(2002)

	Size of economic unit				
	1 to 4 workers	5 to 19 workers	Micro- and small-scale 1 to 19 workers	Midium- and large- scale 20 + workers	Total Firms
Agriculture and forestry	70,3%	70,8%	70,4%	47,0%	67,6%
Mining and hydrocarbons	42,5%	29,2%	33,9%	40,9%	39,0%
Manufacturing industry	60,7%	54,8%	59,4%	33,0%	55,3%
Electricity, gas and water	0,0%	6,4%	4,3%	14,3%	14,9%
Construction	57,1%	60,9%	58,3%	39,9%	56,6%
Commerce and other services	46,3%	48,9%	46,5%	23,3%	45,7%
Hotels and restaurant	48,1%	29,9%	45,4%	16,8%	44,6%
Transport, storage nad communication	44,9%	49,7%	45,8%	33,1%	42,7%
Financial intermediation	68,2%	25,5%	36,9%	10,8%	23,0%
Business services	26,5%	16,2%	23,8%	32,4%	24,5%
Public services	34,3%	2,2%	14,9%	27,6%	24,5%
Education	38,4%	27,2%	29,7%	13,9%	20,6%
Social and health services	29,8%	27,0%	28,9%	9,3%	21,2%
Community and personal services	58,3%	31,0%	51,2%	37,7%	49,2%
Domestic services	44,9%	100,0%	47,4%	0,0%	48,1%
Others	6,8%	47,9%	35,6%		35,6%
Total	51,2%	44,4%	49,8%	26,2%	45,6%

Source: Own estimates based on 2002 Household Survey

There is a predominance of unpaid labour in total employment of micro and small enterprises. According to the 2002 household survey (see Table 22), the share of non-paid workers—i.e. self-employed, family workers and owners, partners and non-paid employers—in total workers employed in micro- and small scale firms stood at 63.4%. Salaried workers account only for 35.4% of employment in micro and small firms, of which 10.5% are blue collar and 24.9 are white collar workers. The small share of salaried workers employed in micro- and small scale businesses might constitute a means of reducing costs to the firm, in order to compete in the market. Due to the low levels of capital available, production is basically labour intensive, and thus labour comprises the bulk of production costs. Therefore, since it is not possible to use unpaid hired labour, informal enterprises tend to resort to family members

as a source of cheap labour. Family workers get engaged in productive activities, voluntarily or by the decision of the household head, as paid or unpaid family workers. Thus the low share of salaried workers might be evidencing the existence of overexploitation of family workers, and the self-employed himself, as a means of maintaining the subsistence of the firm in the market and generating incomes to the household.

Table 22
Employment Composition per Size of Economic Unit and
Employment Category
(2002)

	Size of economic unit				Total Firms
	1 to 4 workers	5 to 19 workers	Micro- and small-scale 1 to 19 workers	Midium- and large- scale 20 + workers	
Blue collared workers	7,4%	22,7%	10,5%	11,4%	10,7%
White collared workers	16,9%	55,9%	24,9%	81,8%	33,7%
Self employed	58,0%	7,8%	47,8%	3,2%	40,9%
Owner, partner or paid employer	0,9%	1,6%	1,0%	1,3%	1,1%
Owner, partner or non-paid employer	4,5%	4,0%	4,4%	0,3%	3,8%
Cooperativist worker	0,0%	0,2%	0,0%	1,6%	0,3%
Non-paid family workers	12,2%	7,7%	11,2%	0,4%	9,6%
Domestic servants	0,1%	0,0%	0,1%	0,0%	0,1%
Total per firm size	100,0%	100,0%	100,0%	100,0%	100,0%
Share in tota workers	67,2%	17,3%	84,5%	15,5%	100,0%

Source: Own estimates based on 2002 Household Survey

Poverty incidence among workers employed in micro and small firms is the highest for paid blue collared workers (67.7%). Other worker categories that exhibit severe poverty incidence are non-paid family workers (62.1%), cooperative worker (55.4%) and self employed (52.2%). Poverty incidence tends to be much lower among owners, partners and employers (between 20.4% and 28.4%), and white collared workers.

Obviously, poverty incidence is much higher among non-paid workers, which are mostly employed in informal activities. A high poverty incidence is linked to low income levels, which in turn are the result of low productivity levels.

Table 23
Poverty Incidence in Workers per Size of Economic Unit and
Occupational Category of Workers
(2002)

	Size of economic unit				Total Firms
	1 to 4 workers	5 to 19 workers	Micro- and small-scale 1 to 19 workers	Midium- and large- scale 20 + workers	
Blue collared workers	66,1%	69,8%	67,7%	58,4%	65,7%
White collared workers	41,8%	31,9%	37,2%	20,3%	30,5%
Self employed	52,2%	54,1%	52,2%	47,3%	52,1%
Owner, partner or paid employer	23,4%	13,9%	20,4%	0,0%	16,5%
Owner, partner or non-paid employer	29,3%	24,6%	28,4%	29,4%	28,7%
Cooperativist worker	63,9%	52,1%	55,4%	62,3%	59,6%
Non-paid family workers	61,3%	66,6%	62,1%	73,3%	62,2%
Total per firm size	51,2%	44,4%	49,8%	26,2%	45,6%

Source: Own estimates based on 2002 Household Survey

Despite the important progresses attained in the last 20 years, inadequate training and low educational achievement of the labour force constitutes a main impediment that restrict productivity increases in micro and small scale firms and in the economy as a whole. Low educational achievements of workers are basically the result of the significant problems faced by the national educational system. Furthermore, complementary educational programmes, parallel to the formal educational system, were not properly developed, such as education programmes for adults, technical training, etc. According to data obtained through household survey (see Table 24), in 2002, 78.7% of workers employed in micro- and small scale firms attended—not necessarily completed—at most primary or secondary education. Five percent of workers did not have the most basic education. The bulk of workers only attended primary education (45%). Only 16.2% of workers attained tertiary education, both at the technical and university levels. Workers with higher educational grades tend to be concentrated in medium and large enterprises. Workers that have attended tertiary education comprise 49.8% of all those employed in firms of this size.

Table 24
Employment Composition per Size of Economic Unit and
Educational Level of Workers
(2002)

	Size of economic unit				Total Firms
	1 to 4 workers	5 to 19 workers	Micro- and small-scale 1 to 19 workers	Midium- and large- scale 20 + workers	
No instruction	5,8%	2,4%	5,1%	1,2%	4,5%
Primary education (1 to 8)	48,1%	33,0%	45,0%	20,2%	41,1%
Secondary education (9 to 12)	33,0%	36,3%	33,7%	28,8%	32,9%
Tertiary (13 +)	13,1%	28,3%	16,2%	49,8%	21,4%
Total per firm size	100,0%	100,0%	100,0%	100,0%	100,0%
Share in total workers	67,2%	17,3%	84,5%	15,5%	100,0%

Source: Own estimates based on 2002 Household Survey

The single most important variable in explaining income differentials among urban workers is the educational degree attained. Education is closely linked to labour productivity and therefore to worker's earnings. Therefore, poverty incidence is much higher among workers with the lowest educational levels. Labourers without any educational achievement tend to be the poorest among urban workers. They are affected by the highest degrees of poverty incidence (49.8%). Workers with tertiary education are less affected by poverty (only 24.7% of poverty incidence).

Table 25
Poverty Incidence in Workers per Size of Economic Unit and
Educational Level of Workers
(2002)

	Size of economic unit				Total Firms
	1 to 4 workers	5 to 19 workers	Micro- and small-scale 1 to 19 workers	Midium- and large- scale 20 -+ workers	
No instruction	5,8%	2,4%	5,1%	1,2%	4,5%
Primary education (1 to 8)	48,1%	33,0%	45,0%	20,2%	41,1%
Secondary education (9 to 12)	33,0%	36,3%	33,7%	28,8%	32,9%
Tertiary (13 +)	13,1%	28,3%	16,2%	49,8%	21,4%
Total per firm size	100,0%	100,0%	100,0%	100,0%	100,0%
Share in total workers	67,2%	17,3%	84,5%	15,5%	100,0%

Source: Own estimates based on 2002 Household Survey

Technology and micro- and small scale firms

Micro and small scale firms are in essence labour intensive, therefore their capital endowment tends to be very low. Data available shows that on average, micro- and small economic firms' endowments of productive assets—e.g. machinery and equipment—is only about US\$ 596. Thus, the endowment of productive-asset per workers is also very low, amounting to only US\$ 319 per worker. Productive asset endowments, per firm and per worker, are the highest in the manufacturing sector, being about 2.5 times the average for total micro- and small scale firms. Firms in the service sector tend also to have relatively high endowments of productive-assets. Conversely, productive asset endowment for firms operating in commercial activities tends to be almost negligible. Thus, these activities tend to rely exclusively on int's labour force.

Table 26
Sells and assets by micro- and small scale firms
(US dollars)

	Manufacturing	Services	Commerce	Total
Sells per firm	7.928	6.982	7.285	7.291
Sells per worker	3.362	2.995	4.845	3.901
Productive assets per firm	1.461	1.314	0	596
Productive assets per worker	619	564	0	319
Total assets per firm	5.293	6.324	2.724	4.146
Total assets per worker	2.244	2.713	1.812	2.218
Sells/productive assets	5,4	5,3		12,2
Machinery per firm	1,3	1,2	0,0	0,5
Machinery per worker	0,6	0,5	0,0	0,3
of which:				
Manual	34,4%	30,7%		32,0%
Electric	10,3%	6,9%		8,1%
Man/elect	47,4%	49,3%		48,6%
Others	7,9%	13,1%		11,2%

Source: own estimates based on Larrazábal and Montaña

Micro- and small scale firms' endowments of machineries are also very reduced. On average, each economic unit owns around 0.5 machines. Thus, the amount of machinery per worker tends to be even smaller (0.3 per worker). Again, small scale firms operating in manufacturing and service activities exhibit the highest machinery endowments, i.e. 1.3 and 1.2 machines per worker respectively. Micro- and small scale firms operate machines that work with different energy sources. Most of them utilize electricity (48.6%) as a primary source of energy. However, there is a significant proportion of machines that are operated manually operated (32%). The rest of them utilize other sources of energy.

In sum, the urban informal sector in Bolivia, is largely linked to material survival of households. This category embraces a wide range of activities by artisans, petty traders, street vendors, assistants of bus drivers, etc. Micro- and small-scale firms comprise the bulk of urban employment and are engaged in non-tradable activities, such as commerce, personal services, transport services, repair services and construction. Manufacturing also has an important share in total urban employment. There is also a predominance of unpaid labour in employment of micro and small enterprises in the informal sector. The bulk of informal labourers have jobs as self-employed, family workers and owners, partners and non-paid employers.

The largest share of workers suffering poverty is employed in micro and small enterprises. Their main source of income is the profit earned in the firm, including the imputed incomes of own-account worker and of family labourers. Low income levels are linked to reduced labour productivity, due to the inadequate educational levels attained by workers. Labour productivity in micro and small-scale firms, in the urban informal sector, is also constrained by reduced investment levels, which in turn result in small endowments of productive capital per worker, e.g. machinery and equipment, also constrain labour productivity in micro and small enterprises.

Next section analyses a number of key policies that should be implemented in order to increasing employment opportunities for the poorest segments of Bolivian urban workers.

Addressing the poorest of the poor

Restoring sustained economic growth and facilitating the development of labour intensive sectors are essential to reduce poverty and inequality in Bolivia. To attain this overall objective, it is necessary to create a policy environment that promotes increased productivity and job creation. The discussion carried out along this paper helped to identify key policy intervention areas, where appropriate policies need to be implemented. These areas are: i) improving the environment for businesses development, ii) improving access to domestic and foreign markets, iii) investing in human capital and iv) investing in productive infrastructure.

i) Policies to improve the business environment

Policies should be aimed at improving the investment climate in which firms operate. A reliable business environment is essential to promote investment, and the creation of job opportunities. Investment ratios are very low in Bolivia (12.4% of GDP in 2004). The country needs to attract larger investment flows, both foreign and domestic, especially in sectors that are labour intensives.

The policies to be implemented range from maintaining macroeconomic stability, to strengthening property rights, the rule of law and institutions. Bolivia has maintained macroeconomic stability over the last two decades. However, this condition is essential, but not sufficient to generate the levels of investment necessary to increase productivity—and therefore economic growth, job creation, and poverty reduction. There are other areas where important improvements need to be done. These includes actions to reduce red tape; to strengthen property and creditor rights; contract enforcement, registering of property, and collateral law; to put in place mechanisms to increase access to prudent financing for small and medium enterprises; and to improve judiciary and public services, trade logistics and supply chains (World Bank, 2005).

ii) Improve market integration

As discussed along the paper, another key constraint that limits business expansion in Bolivia is the reduced size of its domestic markets. Thus, attaining higher pro-poor economic growth will depend on fully expanding export potential and integrating into the global economy. Bolivia has the potential to diversify its exports, expanding exports of labour intensive products, with higher value added. To this end, policies should focus on developing a comprehensive strategy for opening export markets for Bolivian products

This strategy should also focus on diversifying export markets. Bolivia's main export markets are Mercosur (natural gas mainly) and the Andean Community (soya and soya products). Other export markets have remained largely unexploited to Bolivian exporters, such as the European Union and the Asian countries. Bolivian exporters do not fully use the preferences they enjoy under trade agreements. This reflects Bolivia's limited export bundle and weak negotiation and implementation of trade agreements.

In the last few years, manufacturing and non-traditional exports to the United States have tended to increase based on the ATPDEA trade preference agreement. However, these preferences are due to expire in 2006. Therefore, it is crucial that Bolivia enter into negotiations with the United State for a Free Trade Agreement. Otherwise, the country risks losing the American market that has the potential to be its most important market for non-traditional, labour-intensive, and manufactured products.

In addition, policies should focus on strengthening trade institutions and instruments, to afford strong support for exporters, such as: strengthening the export promotion office CEPROBOL, promote the temporary import regime (RITEEX) among exporters, simplifying the system to refund tariffs and internal taxes to exporters, strengthening basic infrastructure and institutions for standards and quality control.

iii) Invest in human capital

The discussion carried out along this paper clearly shows that low educational and training levels of the labour force have hampered increases in productivity and incomes. This in turn has prevented the curtailment of the high levels of poverty incidence among workers. Education indicators have improved, but they are still low by regional standards, particularly related to the quality of education.

Thus, policies should focus on rising the quality of the education system, particularly for the poor. This should include implementing an education sector strategy aimed at developing basic cognitive skills and improving the productivity of the labour force. The main elements of this strategy should include: filling coverage gaps in universal basic education, improving secondary education transitions and access to private higher education for poor students, addressing low quality and inequalities in education achievements at all levels, training in high schools and colleges on relevant skills demanded in the labour market.

iv) Invest in infrastructure

The physical infrastructure is extremely limited and is compounded by the geographic obstacles Bolivia faces. The infrastructure gap has become a major limitation on productivity growth, hampering employment creation and poverty reduction. Lack of adequate infrastructure hampers access to markets for small and large scale producers alike, and therefore prevents a much greater development of productive chains and clusters. Given the difficult geographic characteristics prevailing in Bolivia, transport of production to markets becomes difficult, considering the large dispersion of a relatively small population living within a relatively large geographic area. Transport costs become a sizeable component of production costs, and very often is a crucial factor in making domestic production non-competitive in external markets. Bolivia is the county with the lowest density of paved roads in Latin America and its condition as a landlocked country difficult access to sea ports.

There are other types of basic infrastructures, such as irrigation, that are also lacking in Bolivia, and therefore constitute a major constraint to production and productivity growth. Thus, there is a considerable effort to be made in expanding the existing road infrastructure. The role of public investment in expanding productive infrastructure, and therefore in promoting growth and employment creation, is discussed in more detail in the following section.

6. Productive infrastructure and the role of public investment

Public investment in productive infrastructure plays a crucial role in promoting economic growth, employment and poverty reduction. Apart from its role in creating productive capacity that will promote productive growth, public investment in infrastructure can help to create employment in the short term. In terms of the choice of technology, the adoption of labour-based approaches in the construction of infrastructure can result in much higher employment from a given amount of investment without the need to compromise on quality and efficiency. Infrastructure, e.g., rural roads, irrigation, and other construction works like land development, protection of environment, etc. can contribute positively to development and poverty reduction by integrating hitherto isolated regions and potential markets, and thus catalysing the growth of economic activities.

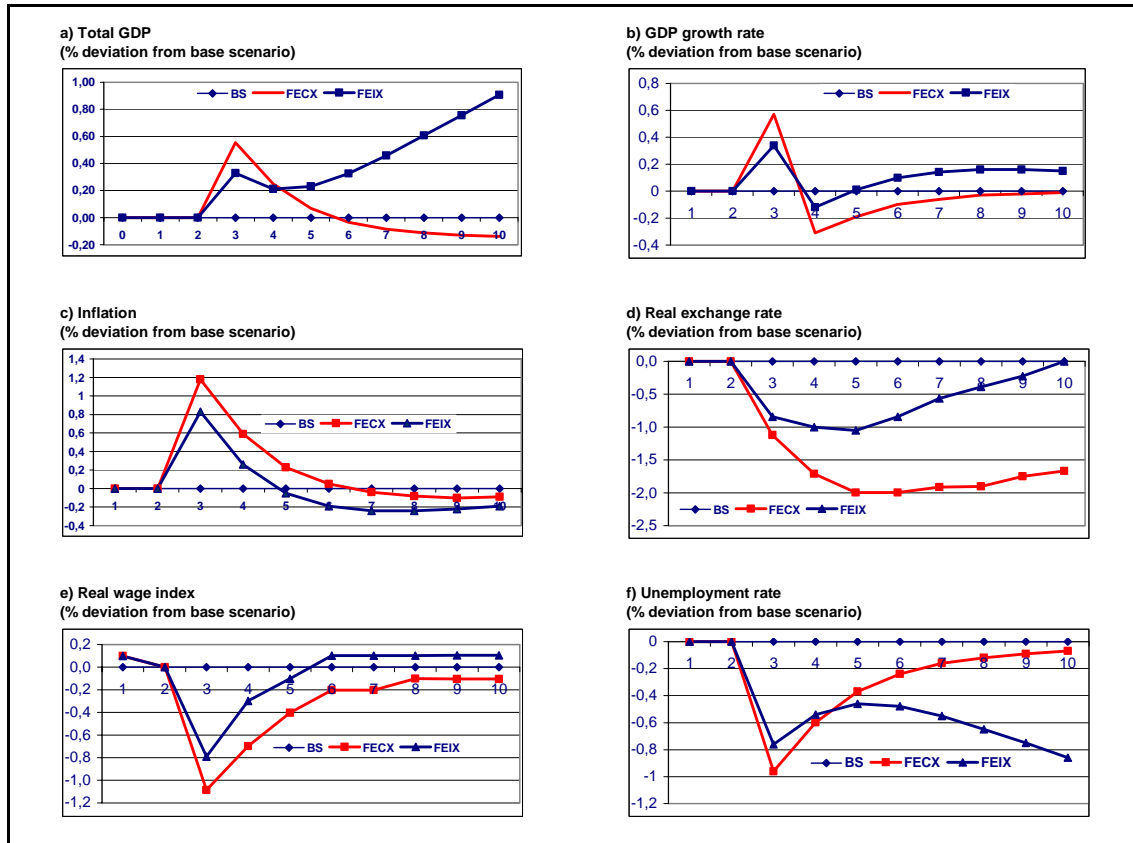
A major constraint that limit larger public investment in infrastructure is the severe budget constraint that nowadays faces the Bolivian public sector. Fiscal deficit has been as high as 8.9% of GDP in 2002. The government expects to reduce the deficit to 3.5% of GDP in 2005. As a result, badly needed public investment in the social sector has been curtailed in order to reduce the fiscal gap. Given the acute fiscal gap that constraints public investment in infrastructure, it is important to invest the scarce resources available, in projects that will maximize the impact of public investment in terms of economic growth, employment creation and poverty eradication.

Graph 8 shows the result obtained through counterfactual simulation exercises carried out using a multisectoral Computable General Equilibrium Model (CGE) constructed for the Bolivian economy. The simulation exercises compare the effects of an increase in government expenditures on different variables, such as GDP growth, inflation, real exchange rate, real wages and unemployment rate. The shocks introduced to the model are: i) an increase in government current expenditures (e.g. armed-force salaries), which do not increase the productive capacity of the economy; and ii) an increase in government's investment expenditure (e.g. productive infrastructure) which increase the productive capacity of the economy. In both simulation exercises, the magnitude of shocks is exactly the same. The results obtained were very illuminating, in terms of understanding the different macroeconomic impacts of government expenditures, depending on their efficiency.

In the short run, both types of government expenditures tend to increase GDP growth, due to the increased aggregate demand. However, only in the case of increased investment, growth can be sustained in the long run due to the additional productive capacity created. In the case of increased non-productive expenditures, the initial jump in growth is quickly reversed, and eventually GDP growth ended up at a lower level than that attained if expenditure increases would have not taken place. This is because the potential inflationary effect of increased expenditures could cause a real exchange rate appreciation, which in turn would disincentives exports. Both outcomes have a quite different effect in terms of employment creation and real wages behaviour. The short term effect on employment in both simulation exercises, are similar, as increased demand tends to generate an increased economic activity. In the long run however, the reduced rate of unemployment resulting from the expenditure expansion can only be sustained in the case of investment expenditure, because of the higher growth attained in the long run in this scenario. In the case of real wages, in both simulation exercises there are real wage decreased due to higher inflation resulting from increased demand. However, in the investment increase scenario, real wages tend to recover as higher GDP growth takes

place in the long term and inflation reduces. In the non-productive expenditure expansion on the other hand, real wage reduction tend to be permanent.

Graph 8
Macroeconomic and sectoral impacts of increased government's expending



BS = Base run escenario
 FECX = Fiscal expansion in current expenditures
 FEIX = Fiscal expansion in investment expenditures

The previous analysis demonstrate the importance of an efficient allocation of public expenditures, in terms of promoting economic growth, employment creation and real-wage increases. Government expenditures should put priority in expanding the productive capacity of the economy, through the creation of productive infrastructure. Construction and infrastructure account for a substantial proportion of public investment in an economy like that of Bolivia. And it has by now been demonstrated that in terms of the choice of technology, the adoption of labour-based approaches in infrastructure can result in much higher employment from a given amount of investment without the need to compromise on quality and efficiency. Infrastructure, e.g., rural roads, irrigation, and other construction works like land development, protection of environment, etc. can contribute positively to development and poverty reduction by integrating hitherto isolated regions and potential markets, and thus catalysing the growth of economic activities. BPRS also recognises investment in and provision of infrastructure as a means of boosting the productive system.

7. Summary and Conclusions

The reform program and growth pattern exhibited by the Bolivian economy in the last decade did not favour employment creation and consequently an effective reduction of poverty incidence. During the last decade, those sectors, where the bulk of employment is concentrated, presented the lowest growth rates of GDP, labour productivity and real incomes. Besides, these sectors were affected by the highest levels of poverty incidence. Agricultural workers, that comprise 39.3% of total employment at the national level, presented 81.7% of poverty incidence in terms of income levels. On the other hand, urban activities employing most of the urban labour force, i.e. manufacturing, construction, commerce and other services, also were affected by high poverty levels.

In the case of the rural labour market, the agricultural sector exhibited some positive growth in the last decade, but it did not benefit the poorest segments of workers engaged in these activities. First, agricultural growth was basically explained by the good performance of agrobusiness activities, which produced mainly to satisfy export markets. Conversely, non-commercial agricultural activities, mainly produced by traditional peasant units, remained largely stagnated.

Second, the analysis of land allocation to various crops showed that there was an increase in the shares of land under commercial crops and a decrease in the shares of land under non-commercial crops. These changes in land allocation between crops have not favoured job creation, since the production of commercial crops did not require labour input in large amounts.

Third, agricultural price movements did not favour non-commercial crop producers either, as prices of these crops experienced significant reductions in real terms. As poverty is higher among non-commercial crop farmers, it is clear that price trends have actually worsened their situation, while the commercial farmers have gained from price movements. Likewise, trends followed by the monetary yields of non-industrial crops have not benefited poorer farmers either.

Finally, poverty incidence of workers in livestock was also high. However, workers employed in bovine cattle breeding were better-off than workers engaged in other livestock breeding activities. Breeding of bovine cattle is mostly carried out on an extensive basis and subject to economies of scale. These factors made labour productivity much higher and generated better income returns to workers engaged in modern and more extensive cattle breeding activities.

Promoting labour intensive exports would be an alternative to increase market access for small scale producers. Although it is difficult that small scale producers can have access to external markets by themselves, they should be integrated as suppliers of intermediate inputs along the various stages of a given export oriented productive chain or cluster. In this way, the problem of narrowness and low purchasing power existing in domestic markets, could also be overcome.

The most illustrative case in Bolivia on how integration of small scale producers into export oriented clusters can contribute to reduce poverty, is the case of the soya cluster in the Santa Cruz department. The soya small-scale producers are better-off in terms of incomes compared to agricultural economic workers that produce mainly for domestic consumption markets. Thus, a greater emphasis should be placed on promoting the development of export chains or

clusters, and to promote the integration of small scale producers into them. Sectors that have the potential to developed into more dynamic, export oriented productive chains and clusters are: tourism, wood industry, quinoa, textiles, leather industry, and the grape and wine industry.

The urban informal sector in Bolivia, is largely linked to the material survival of households. This category embraces a wide range of activities by artisans, petty traders, street vendors, assistants of bus drivers, etc. Micro- and small-scale firms comprise the bulk of urban employment and are engaged in non-tradable activities, such as commerce, personal services, transport services, repair services and construction. Manufacturing also has an important share in total urban employment. There is also a predominance of unpaid labour in employment of micro and small enterprises in the informal sector. The bulk of informal labourers have jobs as self-employed, family workers and owners, partners and non-paid employers.

The largest share of workers suffering poverty is employed in micro and small enterprises. Their main source of income is the profit earned in the firm, including the imputed incomes of own-account worker and of family labourers. Low income levels are linked to reduced labour productivity, due to the inadequate educational levels attained by workers. Labour productivity in micro and small-scale firms, in the urban informal sector, is also constrained by reduced investment levels, which in turn result in small endowments of productive capital per worker, e.g. machinery and equipment, also constrain labour productivity in micro and small enterprises.

Restoring sustained economic growth and facilitating the development of labour intensive sectors are essential to reduce poverty and inequality in Bolivia. To attain this overall objective, it is necessary to create a policy environment that promotes increased productivity and job creation. The discussion carried out along this paper helped to identify key policy intervention areas, where appropriate policies need to be implemented. These areas are: i) improving the environment for businesses development, ii) improving access to domestic and foreign markets, iii) investing in human capital and iv) investing in productive infrastructure.

Public investment in productive infrastructure plays a crucial role in promoting economic growth, employment and poverty reduction. Apart from its role in creating productive capacity that will promote growth and employment, public investment in infrastructure can help to create jobs in the short term. The adoption of labour-based approaches in the construction of infrastructure can result in much higher employment from a given amount of investment without the need to compromise on quality and efficiency.

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Annex A

Factors that constrain agriculture sector development

There are different problems that limit the productive development of the agriculture sector in Bolivia. The National Strategy for Agricultural and Rural Development (ENDAR), elaborated by the Ministry of Peasant and Agriculture Affairs, summarize these problems in two broad categories: i) narrowness of domestic markets and limited access to foreign markets, and ii) low levels of productivity. The following section discusses in more detail these two categories of constraints.

i) Narrowness of domestic markets and limited access to foreign markets

A serious problem faced by the agricultural sector as a whole is related to the narrowness of domestic markets, as well as its limited growth capacity. The Bolivian population was only 9.03 million in 2003, and per capita income was barely higher than US\$ 800. Given the large extension of the Bolivian territory—i.e. 1,09 million square kilometres—the country's demographic density is only 8.2 persons/square kilometre. According to the 2001 National Census figures, 62.4% of the population lives in urban areas and only 37.6% in rural areas, bringing about a high geographic dispersion of the rural population. As a result, a large share of the population has difficulties in accessing markets, either as suppliers or consumers. Besides, given the very low levels of incomes, most of the population exhibit low purchasing-power levels, even to guarantee their basic food consumption. Thus, growth of food supply has tended to situate above consumption growth. Narrowness of markets is also linked to the reduced demand of agricultural inputs coming from the manufacturing sector, which in turn translates into an insufficient transformation of agricultural production.

Regarding access to foreign markets, as was explained before, agricultural exports have exhibited a significant expansion over the last two decade. However, growth was explained mostly by high growth of soya exports and soya by-products to countries belonging to the Andean Community of Nations (CAN). Bolivian exporters took advantage of this situation because they benefited from a preferential access to those markets for their soya production, as a country member of CAN. However, potential bilateral or multilateral free trade agreements that the Andean countries may arrive with MERCOSUR countries, might represent competitiveness losses for the domestic soya production vis-à-vis soya produced in countries such as Argentina and Brazil, and eventually might bring about market losses.

There is also a low diversification of export markets, since the bulk of agricultural exports is concentrated in the Andean Region, remaining other regional markets, such as the European Union, Asia, MERCOSUR, NAFTA, etc. totally unexploited. This is partly explained by low negotiation capacity existing in Bolivia, which has prevented local production to gain access to new markets or to improve its access to markets already available under existing agreements.

ii) Low productivity of domestic production

Bolivian agricultural production suffers from low levels of productivity, which is reflected in the widespread low levels of yields per hectare for the bulk of crops produced. Yields are very low compared to those observed for similar crops in other countries of the region. Yields in

the Bolivian agriculture are half the average levels observed in South American countries, for crops like cotton, rice, sugar cane, barley, corn, potato and wheat. Low productivity levels are also reflected by low yields per worker engaged in agriculture activities, due to the insufficient and inadequate qualification of human resources and to the low levels of capital per worker available. Labour productivity in the agriculture sector lags behind productivity levels observed in other sectors of the Bolivian economy as well, being the former only 37% of the average labour productivity of the economy, and only 3.7% compared to labour productivity in capital intensive sectors such as mining and hydrocarbons.

There are various factors that explain agriculture sector low productivity in Bolivia:

a) Land erosion. Productive capacity losses are linked to erosion and desertification processes, and to an inappropriate use of land. In the one hand, wind erosion has tended to affect mainly the flat lands located in the high plateau (Altiplano), in the west part of the country, as well as those lands located in the low regions, in the east part of the country. Water erosion on the other hand, has tended to reduce productivity mostly in lands located in the mountain and valley areas. The former type of erosion has intensified due to the deforestation of large extensions of land. Land erosion is identified as one of the main factors that have diminished farming productivity in the past and even resulted in extensive losses of productive land. Peasant agriculture units that utilise traditional production methods have become less efficient and sustainable over the years, since peasants find more difficulties in adjusting to changes in exogenous factors such as climate conditions, production methods and technology, urban centres expansion, changes in consumption habits and markets. This has caused an overexploitation of the limited natural resources available to producers (land, water, seeds, genetic, biodiversity and biomass) overtime, aggravated by the limited capacity of peasant units to invest in the recovery of resources. In modern entrepreneurial agriculture, natural resources depletion is linked to the indiscriminate expansion of the agricultural frontier. Only in the Santa Cruz department, deforestation affected to more than 2 million hectares of forest a year. Other important factors causing environmental degradation are the indiscriminate use of agrochemicals, inadequate agricultural practices and the improper use of agricultural machinery.

b) Inadequate access to productive lands and judicial insecurity are also factors that restrict productivity growth in the Bolivian agriculture sector. The structure of land property in Bolivia varies from cases of extreme parcelling of land, in the western regions, to cases of large land concentration, in the eastern regions. The Land Reform carried out in 1953 was intended primarily to satisfy the socioeconomic demands of the peasantry in the highlands and valleys regions. The Reform comprised a large redistribution of land from large landed states to small peasants. The Reform also introduced restrictions to property rights over small and community plots. Restrictions limited the capacity of owners to use redistributed lands as collaterals, in order to leverage investments or to have access to financial credit, as well as prohibited the selling of land. This has caused a process of continuous land parcelling over time, through the inheritance of plots from the initial beneficiaries to his descendents, making agricultural plots smaller and smaller over time and transforming agricultural production in highly inefficient.

In the high plateau area, where small plots are concentrated, there exist large demands for new lands, reaching an estimate of 215 thousand hectares per year, in order to satisfy the demand of about 4.3 thousand new productive units. Demand for land access has transformed into one

of the chief vindications of peasant/indigenous organizations, whose pressures have led, in some cases, to occupations of presumably unproductive lands, thus risking judicial security.

The existence of both, large agricultural states and very small plots, have not promoted the conformation of efficient agricultural productive units, based on more efficient intermediate-size plots, which in turn could be more appropriate for an optimal use of agricultural machinery and inputs, and thus, contribute to the creation of true productive employment opportunities capable of maintaining a sustainable increase in real wages and incomes in the long term.

c) **Technological lag**, which affects the agricultural sector as a whole, being the technological gap however greater in traditional peasant units. The causes of the technological lag are varied:

- Weak research and technology transfer systems. Although the Bolivian Institute of Agricultural Technology (IBTA) has developed an important research work, it has had problems in the transference and extension programs, and has not attained the expected results at the agricultural farm level. Even in the entrepreneurial sector, where significant improvements were attained in terms of efficient land allocation to crops and dissemination of technology packages, research centres have not accompanied the expansion of the agricultural frontier. Thus, competitiveness of entrepreneurial agriculture is still fundamentally based on the fertility of soil and on the preferential access of domestic production to markets in the Andean Region countries.

- Insufficient training levels of human resources also contribute to the technological backwardness of Bolivia's agricultural sector. This problem has to do with the existence of an inefficient educational system and its deficient functioning in rural areas, both, in terms of its focus on knowledge which is not relevant to rural population's reality, as well as the low quality of educational services. The latest being the result of deficient training of teachers, teachers' absenteeism, lack of continuity, lack of teaching material, and poor quality of school infrastructure. Besides, there is lack of specialized and qualified agricultural training centres, which could introduce a different approach to training programmes, which would transcend an excessive focus on productive issues only and put more emphasis on other important aspects, such as farm management and marketing of crops.

d) **Limited access to credit.** Overall, there is lack of an efficient system that could supply finance to agricultural activities. Since 1999, the financial system in Bolivia has experienced an acute credit crunch process. The entrepreneurial agricultural sector is facing problems of high indebtedness, which in turn has drastically reduced agricultural firms' access to new credit finance. So far, different initiatives, devised by the economic authorities, to implement a workable debt restructure strategy have produced poor results, including measures that have tended to loosen the existing prudential regulation in the financial system. Access to credit by traditional agriculture units is also very limited. Although micro-credit in Bolivia has achieved important developments, the financial technology applied has demonstrated to be more suitable for commerce and service businesses rather than for agricultural activities, which require larger amounts of credit, longer repayment periods and lower interest rates. The development of rural financial systems has been constrained by imposed debt forgiveness programmes, subsidized credit and interest rates ceilings.

e) **Poor rural infrastructure.** Public and private investment flows, necessary to develop an adequate infrastructure to promote productivity growth in agricultural activities, have been very limited in the past. There are a number of services where more investment is needed to enhance agriculture productivity.

- **Electricity.** Electricity services have low coverage in rural areas. In areas with access to electricity services, only 15% of installed capacity is utilized in non productive household consumption. The use of alternative sources of energy, such as natural gas, is not widespread either, even though there exists large reserves of natural gas in the country.
- **Irrigation.** There are deficiencies in the provision of irrigation infrastructure. Although this factor is regarded as the main constraint faced by the Bolivian agricultural sector, Bolivia has the smallest extension of irrigated farmed area in South America. Overall, there is a notorious deficit of water, which affects crop yields and contributes to establish a significant dependency of production vis-à-vis the rain regimes.
- **Local roads.** There is neither an adequate system of local roads, to guarantee access of agricultural suppliers to local markets. The local-road system comprises about 38,240 kilometres (70.3% of the country's total road system) and is under the control of local municipalities. Municipalities do not have the technical and managerial capacity to look after local roads.

Annex B

Land tenure in Bolivia

The World Bank (1996) identifies 6 typologies of existing land tenure in Bolivia:

- a) Communal systems of hunters, gatherers and subsistence farmers in the Amazon Basin, Eastern Lowlands (Oriente) and Chaco
- b) Communal systems of peasant farmers in the Altiplano and highlands
- c) Communal systems of peasant farmers in temperate valleys and irrigated regions
- d) Family farm colonies of recent settlers in the eastern edge of the Andean mountain range.
- e) Extensive livestock ranches in the Beni savannas, Chaco plains, eastern Santa Cruz, and northern La Paz
- f) Independent commercial agricultural farms in various regions

According to the World Bank (id.ib), although this classification is not all-inclusive, it covers the overwhelming majority of landholdings and rural population in the country.

Communal systems of hunters, gatherers and subsistence farmers in the Amazon Basin, Eastern Lowlands (Oriente) and Chaco. This system is characterized by very low population densities, small settlements or communities, and little access to infrastructure or markets. Most population live from a combination of hunting, fishing, gathering forest products over large areas (territories), and from cultivating a few subsistence crops in small plots. Many live in the rain forest itself, but there are also a number of communities that live in the Beni savannas, Chaco plains, Chiquitano hills, and throughout the eastern part of the country.

Comprises some nomadic groups, most of them living in dispersed small communities. These groups are considered as being extremely poor (the poorest in the country). Most populations live from a combination of hunting, fishing, gathering forest products over large areas, and from cultivating a few subsistence crops in small plots. The nomadic groups and most distant communities have no access to social services, water, sanitation, etc. Health problems are a serious problem in most communities. Only recently some communities are becoming integrated to regional markets for forest products, handicrafts, etc., thus opening up opportunities for increased cash incomes, but also threatening their traditional lifestyles.

Communal systems of peasant farmers in the Altiplano and highlands. This type of tenure system is characterized by a long history of strong communal organization, a reliable social network of reciprocal help, and collective strategies the effects of severe climate conditions. Virtually all communities have little crop area (assigned to individual families) and extensive common-use lands for the pasture of cameloids, sheep, and other animals, organized in ayllus and collectively supervised by community members. Ayllus, original communities or ex-haciendas all belong to this category. These groups are extremely poor (among the poorest in the country). These regions are subject to extreme weather conditions, such as hail, frost and droughts. Strong communal organizations are the result of a risk-minimizing strategy. Only those communities located within reasonable distance to urban

centres have access to some social services, such as rural schools or health posts. A large proportion of crops are for home consumption, consisting of tubers, maize, cameloid meat, and Andean cereals (quinoa, tarhui). High altitude, adverse climatic conditions, and very poor soils limit the opportunities to increase agricultural incomes. Migration to other regions of the country is costly. Leaving the safety net of strong community life is too risky for most, except for the young and able.

Communal systems of peasant farmers in temperate valleys and irrigated regions. In the Andean valleys at lower altitude, the risks of hail and frost tend to diminish. Population density is higher, so markets are more developed. This allows farmers to develop more individual income-generating activities and to make decisions somewhat independently from communal priorities. Decisions on production and about parcel subdivision are taken at the family level, and independently of communal considerations. The reduced exposure to climatic risk, thanks in part to irrigation schemes in some regions, allows these communities to have more flexible tenancy arrangements. Parcel fragmentation is severe, but this is compensated by considerable higher land values. Some fraction of these people living under this tenure system, perhaps as many as one-third, is extremely poor. Most peasant farmers in this category, although very poor relative to urban incomes and commercial farming areas, are relatively better off than the average rural dweller. As some of these regions are close to urban centres, social services are more accessible than for highland peasants. In most affluent regions, children attend school regularly. The major problem faced are reduced farm size, severe demand constrains for farm output, primitive technologies and precarious road and storage infrastructure.

Family farm colonies of recent settlers in the eastern edge of the Andean mountain range. This land system is the result of the colonization programmes started in the 1950s with the opening up of some important roads and specific settlement projects. Unlike highland peasants, these farmers are organized in colonies and producer association by product (coca, coffee, rice, tea, fruits) for collective bargaining purposes (titling, roads, services), and not as risk-minimizing strategy. Compared to the regions of origin, these settler farmers have considerably more opportunities to accumulate wealth, mostly in the form of equity of their landholdings. Farms in Chapare are worth between US\$5,000 and US\$15,000, depending on the size, location, and improvements. The main problems faced by these farmers are the barbecho crisis, in northern Santa Cruz, which requires expensive mechanization to overcome, ecological degradation and political pressure in the coca economy in the Chapare region, and health problems in the recent settlement regions.

Extensive livestock ranches in the Beni savannas, Chaco plains, eastern Santa Cruz, and northern La Paz. The main form of landholding under this tenure regime is a family or corporate ranch, with the owner or manager as *patrón*. Successful ranchers divide their time between a rural—for overseeing their ranch—and urban residence—for securing the necessary information, credit, and marketing contacts. These estates rely on a combination of a resident class of peons, who are assigned small plots within the ranch to cultivate subsistence crops (maize, yucca, bananas, rice), and seasonal workers who provide the needed labour for annual tasks, such as building fences and corrals, burning old pastures, etc. Both kind of workers are usually hired from nearby indigenous communities. *Capataces* live relatively well for rural standards, as their families are often taken care of by the rancher (*patrón*). Peones are usually assigned a small parcel within the ranch for subsistence crops (rice, yucca, banana, maize). Given the isolation of ranching activity, most peons have little or no access to social services. Seasonal workers usually live in nearby communities (mostly

indigenous groups) and cultivate the same subsistence crops, raise a few animals, and earn cash incomes from the ranch (about US\$ 100 a month plus lodging), food is often provided by ranchers at cost.

Cattle raising in Bolivia is primarily done on an extensive basis (5 hectares per head) and subject to economies of scale (access to credit, breeding and marketing). In the Beni natural savannas there are about 4,000 ranches, with about 2.6 million head, occupying about 10 to 12 million hectares (average size of ranches: 4 to 5 thousand hectares). Beni ranches hire some 15,000 peons on a permanent live-in basis and a large number of seasonal workers (6 months). In Santa Cruz there are small (smaller than 300 heads) and medium (between 300 to 800 head) ranches. These have 700,000 and 350,000 head. In the Chaco region, there are some 800,000 head in very large ranches (several thousand hectares) that often have conflicts with indigenous communities.

Independent commercial agricultural farms in various regions. These landholdings belong to the classic category of family or corporate commercial farm, that is heavily influenced by market conditions, such as export prices, and subject to periodic technological innovations. Most of the commercial farms in Santa Cruz are of recent development, especially those devoted to soya, wheat, sunflower, and sorghum. Cotton and sugar cane are older commercial crops. Most of the development has taken place in the expansion region (eastern lowlands). Land under soya alone has grown in this region from 68,000 hectares in 1991 to 653,220 hectares in 2003. It is interesting to note the relative importance of non-Bolivian farmers. The Mennonites, in particular, produce over one-third of soya and more than half of wheat, although the number of Bolivian and Brazilian farmers has grown significantly over the last years. Except for a very few large farms, most farmers in this region suffer from tenure insecurity, given the proliferation of titles, overlapping claims, and unclear parcel boundaries. Titling itself is no guarantee of tenure security. Successful commercial farmers are among the wealthiest members of Bolivian society. Santa Cruz holds much potential for economic growth by resolving tenure insecurity issues and enforcing a land use plan.

Table B-1
Typology of Land Tenure Systems

Typology of Land Tenure System	Location	Typeo of Tenue	Living Conditions	Estimated Population	Estimated Area of Region (Sq Km)	Population Density (per Sq Km)
Communal systems of hunters, gatherers and subsistence farmers in the Amazon Basin, Eastern Lowlands (Oriente) and Chaco	Beni, Pando, Santa Cruz, parts of northern La Paz, Cochabamba, western Chuquisaca, and Tarija	Some nomadic, some live in dispersed communities over vast areas. Land rigths are not fully recognized	Virtually 100% are extremely poor -among the poorest of the poor	158.000	182.500	0,87
Communal systems of peasant farmers in the Altiplano and highlands	Altiplano, haighland valleys of northern Potosí and Chuquisaca, and south Cochabamba	Family allocation within communal tenure. Most land is titled	Almost 100% are extremely poor. Access to good quality land is severely limited	888.000	161.700	5,49
Communal systems of peasant farmers in temperate valleys and irrigated regions	Near Lake Titicaca, valleys of Cochabamba, Chuquisaca, Tarija, and western Santa Cruz	Tiny family farms within loose communal organizations. Most land is titled, but plots are fragmented	Most are very poor, but better off than those in (i) and (ii). Some in extreme poverty. Access to land is limited	758.000	57.900	13,09
Family farm colonies of recent settlers in the eastern edge of the Andean mountain range	Yungas, Alto Beni, Chapare, northern Sanra Cruz	Small (10 to 50 ha) family farms. Most land is titled, but not for recent settlers	Many can be considered rural middle class, but some very poor. Reasonable access to land	574.500	105.000	5,47
Extensive livestock ranches in the Beni savannas, Chaco plains, eastern Santa Cruz, and northern La Paz	Beni savannas, Chaco plains, east Santa Cruz, and northern La Paz	Large (500 to 50,000 ha) family and corporate ranches. Most land is titled	Owners are relatively wealthy. Peons and seasonal workers are poor. Access to land is limited	203.700	349.900	0,58
Independent commercial agricultural farms in various regions	Mostly in Santa Cruz, some in Cochabamba, Chuquisaca, and Tarija	Small (up to 50 ha) to large (over 10,000 ha) farms, some with double titling	Non-poor	35.084	603.712	0,06

Source: World Bank

Annex C

Productive clusters

Annex C, carries out a detailed analysis about two key agro-industry productive clusters existing in the Bolivian economy, i.e. soya and quinoa. The analysis tries to identify the main causes that have favored or hampered cluster development potential in each of these sectors.

The cluster of soya

The cluster of soya and soya based industrial products is the most developed in the country and represent, the most successful case in the agro-industry export business sector. Soya bean production is mostly located in the Santa Cruz department, which comprises 97% of the total national production. The high degree of geographic concentration favored the development and consolidation of a wide net of firms and support services to production. Despite its successful development in the last years, production and export are still concentrated in commodities with relatively low value added.

The soya sector also comprises the highest degree of vertical integration. In the production of soya participates 14 thousand producers, being almost 80% of them small scale firms, and produce in areas smaller than 50 hectare size. Soya-grain gathering activities are carried out by the oil industry itself, due to the deficiencies existing in rural gathering centers. The industry has a gathering installed capacity of about 1 million tons per year. Industrial transformation of soya is basically aimed at export markets and is carried out by 7 processing plants, with an installed capacity of 2 million tons per year.

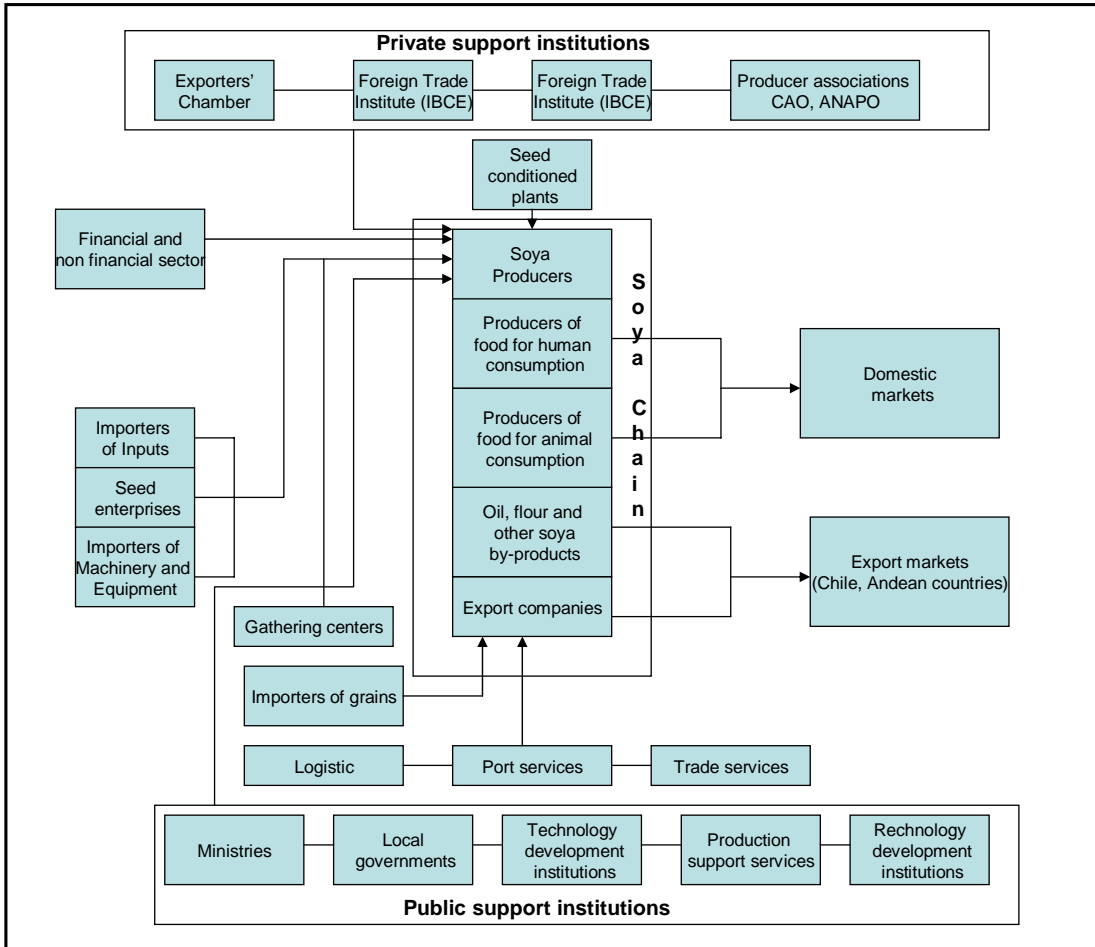
In the last ten years, soya production increased fivefold, and soya exports amounted to US\$ 300 million a year in 2003, representing one of the main export incomes to the country. Soya export composition has experienced change in the last years, having increased the share of more value-added products, such as soya oil, cakes and flour.

Domestic demand for soya-products is very reduced. Only 25% of total soya production is aimed at satisfying domestic demand. There are some small factories that produce handcraft products for human consumption, such as beverage, soya milk, snaks, soya meat, etc. Demand for these products is very limited. Another domestic demand component is for soya-based animal-food markets which are very limited also, except for poult food.

The soya agro-industry chain is supported by diverse suppliers of inputs and specialized services. Almost all inputs utilized in the primary and industrial production of soya are imported, representing increase cost for local producers. There is absence of technology research aimed at developing new export products based on soya beans, as a result of the low levels of investment in technology, both by companies and by the government.

Access to export markets is hampered by transport difficulties, which increase costs. Competitiveness in Bolivian soya production is based on high productivity of land and preferential access to Andean Community countries' markets. The main challenges faced by the sector in the future will be to attain even more diversification, both in terms of increasing the variety of export products, as well as attained a greater diversification of export markets.

Graph C-1
Soya productive cluster



The cluster of Quinoa

Unlike soya, quinoa production is carried out by small-scale family-type economic units only, whose main purpose is to satisfy their basic human consumption needs, and to a lesser extent, to supply domestic markets. Quinoa has a small share in agricultural production, because it comprises only 2% of the total farmed area. Total output value of quinoa was about US\$ 14.5 million in 2002 and represented 2.2% of total traditional-agriculture GDP in that year, estimated at US\$ 643 million. Quinoa production is paramount in the subsistence economy of several peasant communities in the highlands. About 35 thousand hectares are farmed, and total production is about 21.6 thousand tons. There are around 75 thousand small-scale peasant units, utilizing small plots smaller than one third of hectare. About 80% of producers sow quinoa for self consumption purposes only. These producers are mainly located in the north region of the Altiplano. The other 20% is located in the central and south regions of the Altiplano, and produce both, to satisfy self-consumption and to supply domestic markets. Units that produce quinoa exclusively in order to supply markets comprise only 1% of total

producers. It is estimated that quinoa represents between 50% and 85% of total incomes to households producing this crop.

In 1999, quinoa official exports amounted to US\$ 2.7 millions. However, it is estimated that an additional US\$ 2.4 million is exported to Peru unofficially. The volume of quinoa exported is still reduced, compared to other agricultural product exports. However, quinoa exports have presented a positive dynamic and have increased fivefold since the beginning of the 1990s.

The quinoa cluster is little developed and dispersed across the highlands region. In the primary production of quinoa grains there are involved about 75 thousand productive units, which utilize traditional farming techniques with little technology embodied. Intermediaries play an important role in the gathering of production. However, gathering activities are not efficient, given the large dispersion of producers. Most intermediaries are small-scale informal units and sell gathered quinoa to industrial producers or directly to the domestic markets. As mentioned before, part of the production is unofficially exported to Peru, where it is industrially processed. The stage of industrial transformation of quinoa is concentrated in the hands of five firms, which carry out cleaning, selecting and packing processes. Some of these firms have started transforming quinoa into more value-added products. These products however, are not exported because they do not meet international standards yet.

Although quinoa producers are organized in producer associations and there are several organizations that supply support services to producers, these organizations are not well developed and articulated as their counterparts in the soya sector. Quinoa producer associations tend to behave more like trade unions rather than like entrepreneurial associations. Government efforts to lend support in areas of technological research and extension have been disperse and lacked continuity. Furthermore, due to the low volumes produced, there have not been incentives to promote the development of an efficient industrial-input-supplier net.

There are good prospects to expand quinoa exports, as there is a potential demand for organic and highly nutritive food products in developed countries. Expanding export markets for quinoa and quinoa by-products would be an excellent alternative to improve employment and income opportunities to one of the poorest segments of the Bolivian labour force. This strategy however, needs to be accompanied by policies aimed at increasing productivity in small-scale productive units, by promoting their access to technology, financial credit, technical assistance, improved marketing channels, access to information, etc.

Other potential sectors that can be developed are: forestry and wood industry, tourism, textiles, leather production and wine. In what follows, a brief description of these sectors' potential is carried out.

Graph C-2
Quinoa productive cluster

