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APPROPRIATE TECHNOLOGY: SMALL PRODUCERS AND FOOD SECURITY

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Summary

Bolivia is entering the new century with an urban face, where only 38% of the population is rural but still has the highest poverty indices--a phenomenon present throughout most of the nation's territory, where 301 of the 314 municipios are predominantly rural (96%). In addition, 30% of the economically active population (EAP) works in the agriculture and livestock sector, and 70% of the potential business categories identified in the National Dialogue on Production in Bolivia, which was developed in 2004, were in the agriculture and livestock sector.

For these reasons, the government is promoting joint development of the National Agriculture, Livestock, and Rural Development Strategy (ENDAR) through more than 40 workshops (8 national, 9 departmental, and 24 regional), with the participation of over 200 organizations of producers and with the assistance of over 2500 people, reflecting Bolivia's territorial and cultural diversity.

ENDAR makes an exhaustive diagnosis of the sector, defining objectives and goals, and prioritizes *seven policy lines*: i) development of communities of producers, campesinos, settlers, and indigenous and native peoples, ii) development of markets, increased productivity and competitiveness, iii) food security, iv) lands, v) opportunities for nonagriculture and livestock income, vi) construction and improvement of productive infrastructure and vii) new alternative development; as well as the following *cross-sectional policies*: i) environmental sustainability and productive use of natural resources, ii) technical training for rural development, iii) rural business training, and iv) gender approach for development. ENDAR also establishes three *areas of intervention* for its implementation: i) local economic development, ii) production chains, and iii) transfers to communities.

It also revisits an experience in local development and cultural diversity in a rural municipio, which was carried out in two areas. The first was the recovery of natural resources and production bases through the improvement of native grazing fields and the construction of water reservoirs. The second was the introduction of business administration and management instruments, transcending the organizational and political sphere of labor unions. Income growth came not only from greater productivity, but from cultural factors as well. These changes came from human beings and were possible when new value was placed on social capital—a process that was nothing other than education.

Introduction

1. Bolivia has been in the throes of a severe economic crisis for the past five years. Internal factors eroding the national economy include: drop in the purchasing power of the population; skepticism and low levels of private national and foreign investment; export of profits outside the country; imbalance in public finances, primarily the fiscal deficit; and government decisions, such as attempts to impose a progressive tax system on wages in an economy in crisis--all of which led to social and political upheaval in February 2003.

2. Democracy, modernization, technology development, and cultural values coexist and clash every day with the concentration of wealth, social exclusion, ethnic and gender discrimination, and marginal penetration of the international economic system. This is a time of change and confrontation between traditional and modern society, with new actors, new paradigms, and new visions in different parallel processes in the formulation of national policies and strategies.¹

Background

3. Bolivia is entering the new century with an urban face. The rural population accounts for only 38% of the total population. Nonetheless, 301 of the country's 314 municipios are predominantly rural (96%), showing that approximately three million of Bolivia's inhabitants are widely dispersed, thus hindering the provision of basic services and road infrastructure and hence, the possibilities of alleviating poverty.² In addition, 30% of the economically active population works in agriculture with very low levels of productivity.

4. These are depressed social sectors that require a rural development strategy. Thus, the government is promoting collective development of the National Agriculture and Rural Development Strategy (ENDAR) in more than 40 workshops (8 national, 9 departmental, 24 regional), with the participation of over 200 organizations³ of producers

¹ The National Dialogue, the Gas Referendum, the Constitutive Assembly, elections for municipios and prefects, and proposal of a referendum on regional autonomy.

² The rural population, as defined by the National Statistics Institute (INE), is that which does not exceed 2,000 inhabitants in a mapping division. Thus, there can be rural populations even within cities (distant and nearly uninhabited neighborhoods), as well as urban populations (population concentration) within predominantly rural municipios.

³ The most representative organizations include: the Single Union Confederation of Campesino Workers of Bolivia (CSUTCB), the Ayllus and Marcus National Council of Qollasuyo (CONAMAQ), National Confederation of Settlers of Bolivia (CSCB), Indigenous Confederation of the East, the Chaco, and Amazonia (CIDOB), Eastern Bloc, Assembly of Guaranian Peoples (APG), the Eastern Livestock Chamber (CAO), Joint Committee of Campesino Economic Organizations (CIOEC), Landless Movement (MST), and the Bartolina Sisa Federation of Campesino Women.

and the assistance of more than 2500 people, reflecting the geographic and cultural diversity of the country.

5. Since ENDAR is a comprehensive rural development strategy, the National Council on Economic and Social Policies (CONAPES) gives the joint and shared responsibility for its strategic management⁴ to the Ministries of Foreign Affairs and Culture; Education; Health and Sports; Economic Development; Sustainable Development; Services and Public Works; Popular Participation; Treasury; Defense; and Indigenous Peoples and Native Peoples under the coordination of the Ministry of Rural and Agriculture and Livestock Matters (MACA).

6. ENDAR makes an exhaustive diagnosis of the sector, defines objectives and goals, prioritizes seven policy lines and cross-sectional policies, and establishes three areas of intervention for its implementation.

Current Rural Situation in Bolivia

7. Despite agrarian reform, universal suffrage, decontrol of agricultural prices, the green revolution, and the reform of State institutions, the well-being of campesinos, indigenous people, native peoples, and settlers in Bolivia has changed little in over half a century. UNDP states that today each inhabitant of rural Bolivia has barely US\$ 0.10 to 0.15 at the most for daily subsistence. Eighty-two percent of rural inhabitants are poor, and of this figure, 59% are indigent and possess no more than 13% of the arable land.

8. Eighty-seven percent of agricultural land (28 million ha) is in the hands of 7% of landowners. Campesinos possess 4 million hectares (13% of the land) and face the further aggravation of owning small landholdings in the altiplano and valleys, where approximately 16,000 new landholdings are created each year and whose owners receive as little as 1.6% of Bolivia's GDP.

9. Inequality in Bolivia's rural areas results from the concentration of natural and productive resources in the hands of a few sectors that have access to markets and means of accumulation. It also reflects the situation of small producers excluded from markets, who need productive infrastructure and funding for investment. These producers have limited income and little resources for consumption.

⁴ Resolution No. 116/2004 of the National Council on Economic and Social Policies (CONAPES)

Economic Development and Poverty in Bolivia⁵

10. The Bolivian economy grew at an average of 1.9% per year from 1999 to 2003—less than the country's 2.8% population growth, leading to a drop in national per capita income to US\$ 870 and to \$400 in rural areas. The economy's performance is due mainly to the unfavorable international environment and internal factors that adversely affect the dynamic of economic activity.

11. Sixty-three percent of Bolivians live below the poverty line and lack sufficient income to meet their basic needs.⁶ Thirty-seven percent are unable even to meet their dietary needs (extreme poverty or indigence). In rural areas (38% of the national population), 81.7% of the people live below the poverty line, and 5.8% of the rural poor are indigent.

12. The degree of unmet basic needs, such as food, clothing, and shelter is up to 90% in rural areas. This, in conjunction with the lack of basic services, such as electricity, which reaches only one-quarter of rural homes, demonstrates that rural areas are the main locus of poverty and lack of development.

Food Insecurity and Vulnerability

13. Fifty-three percent of the approximately 16,000 rural communities in Bolivia suffer from food vulnerability.⁷ They are mostly concentrated in the Andean valleys, particularly in southwest Cochabamba, north Potosí, central Chuquisaca and part of north Tarija. Approximately one out of every two residents of Potosí and Chuquisaca lives in nutritionally vulnerable communities.

14. The rural population is highly vulnerable to food insecurity, which is often heightened by adverse climatic phenomena (floods, droughts, frosts, etc.) and by the loss of productive capacity in agroecosystems.

15. Even though livestock production has shown a 7% per capita increase in the last five years, the country's rural dwellers have increased their kilocalorie intake by only 0.02%—barely more than levels recorded on the food balance sheets of the last 25 years.

⁵ The poor lack the resources to meet their basic needs, and their rights are being violated by a system that keeps them from active citizenship and deprives them of dignity. (UNDP: 2002 Human Development Report)

⁶ As per data from the World Bank, INE, and UDAPE.

⁷ FAO. 2003 State of Food Security in the World.

Unemployment and Underemployment

16. Insufficient national economic growth results in the creation of unstable jobs, mainly in the informal sector, with subsistence wages for much of the population. The adverse impact of this situation on the primary source of income (on income from directly productive activities, and, by extension, on GDP growth) in households headed mainly by unskilled workers and/or workers in the informal sector, leads economically active members to seek additional sources of income and inactive workers to find unstable employment, leading to lower wages and deeper poverty in the country.

17. Given this context, Bolivia's serious economic crisis over the past five years has resulted in serious unemployment and underemployment problems, particularly in the rural sector. This situation is giving rise to social movements. In a five-member household in which three are able to work, only one or none of them are working.⁸

Economic and Social Exclusion

18. The Bolivian government considers education an important instrument for reducing poverty, which is why educational reform is designed to improve public education and make it available to the entire school-age population. Alternative education is equally important, so policies and strategies in technical education in the fields of agriculture and livestock are being formulated by MACA and the Ministry of Education to provide training in production and to develop mechanisms for continuing education.

19. The population of the altiplano has the greatest lack of health centers (hospitals, health posts, medical services), so the child mortality index is high and life expectancy is shorter. This population lives in makeshift dwellings, and more than 90% lack basic services.

20. It is obvious that women in Bolivia are responsible for decisions about the family economy and that they shoulder the responsibility of doing whatever work they can to ensure the subsistence of the family. As the foundation of the family, women are linchpins in the economic, social, and political life of the country. However, they feel there is a disconnect between their responsibility for basic societal reproduction and their representation in public policy. The general perception among women is that they do not enjoy the same degree of participation as men in social organizations, parliament, or the executive branch because of a bias against women.

⁸ Source: Central Obrera Boliviana (COB).

Market Penetration

21. Aggravation of the crisis in Bolivia brings to center stage the debate on competitiveness in the Bolivian economy and on poverty as a structural factor in a pattern of competitiveness that basically functions under an enclave mentality and is based primarily on the production and export of raw materials with little added value. This behavioral pattern offers little incentive to improve the skills of manual labor and keeps the national economy vulnerable to external changes and the continuous deterioration of terms of trade.

Difficulty Accessing Foreign Markets

22. Bolivia has achieved tariff preferences in the markets of its trade partners but has taken little advantage of them due to its limited supply of exportable goods, the low competitiveness of its products, and its failure to meet quality standards, in addition to para-tariff barriers imposed by the countries that import its national products and/or subsidies for their products, resulting in unfair competition and smuggling. This situation is further aggravated in the case of national agricultural products because they are dependant on climatic factors (floods, droughts, frosts, hailstorms, etc.) and because of the lack of support for boosting the export capacity of sectoral actors.

Tightness of the Domestic Market

23. The tightness of the domestic market is a structural problem affecting the demand for agricultural products and is related to the limited purchasing power of the population (where per capita income is US\$ 870 in urban areas and US\$ 400 in rural areas). The population's low effective demand is also aggravated by the inequitable redistribution of income.

Low Agricultural Productivity

24. In 2003, Bolivia ranked last among 85 countries in terms of competitiveness, as reflected in its difficulty producing goods and services that meet the international parameters of cost, quality, and timeliness needed to remain in the market and profit from it.

25. One of the most critical problems in the agricultural sector is low productivity. This problem limits the income of producers, prevents local products from competing with imports, and hinders the export of national products. Low productivity also impacts national consumers because it increases the price of agricultural products in the local market.

Deficient Productive Support Infrastructure

26. The poor internal road network affects not only the chain of production by preventing the efficient coordination of the centers that produce raw materials with agricultural processing and industrial transformation facilities, it also affects consumer markets. Moreover, high transportation costs decrease the competitiveness of national products; these costs are influenced by the inadequacy of the infrastructure and the long distances between scattered population centers and ports for shipping exports.

27. The infrastructure problems are not confined to transportation; there is also limited development of the irrigation, energy, and telecommunications infrastructure, as indicated below.

- **Irrigation infrastructure** is scarce, despite Bolivia's vast surface and ground water resources. Even though farming is the primary source of employment and main source of food, farmers face serious problems due to the lack of irrigation infrastructure. Barely 10% of the cultivated land in the country has an irrigation infrastructure, and the efficiency of irrigation does not exceed 25%. Investments in irrigation are not sufficient to raise productivity to a level comparable to that of neighboring countries. A more determined, aggressive national effort is needed in institutional strengthening, organization of water resources, and investment planning.
- Coverage of **electric services** is very low in rural areas, and, in areas with electricity, barely 15% of the installed capacity is used for domestic consumption. Of the estimated 764,000 homes in rural areas, only 187,000 (24.5%) have electricity.⁹
- **Feeder roads** cover 38,240 km, or 70% of the country's total road network. Although municipios are responsible for the construction and maintenance of these roads, they do not have the technical capacity to perform these functions, as they lack adequate regulatory standards and technical assistance. Notwithstanding investments in feeder roads over the last five years, bringing together more than 16,000 productive livestock communities via permanent access routes to ensure their presence in domestic and external markets is a long-term commitment.
- **Telecommunications**, despite advances in past 10 years, Bolivia has one of the lowest indices of telephone, Internet, and other service coverage, particularly in rural areas.

⁹ Source: Rural Electrification Plan (2004)

Access to and Regularization of Land Tenure

28. Despite historical changes brought on by agrarian reform, land tenure is still far from equitable for the majority of campesinos in Bolivia. Farm plots of five hectares or less, which include traditional agriculture, represent 68% of farms and 1.4% of the total arable land. Rural properties of one hectare or less account for almost a third of all properties and barely 0.1% of the total arable land. Furthermore, 85% of arable land consists of farms in excess of 500 ha, whose beneficiaries account for 1.8% of the total agricultural units. These figures demonstrate the extreme inequality of land distribution, an aspect that seriously affects productivity.

Deficient Human Resources Education

29. From the revolution of 1952 up to approval of Law 1565 in July 1994, rural education did not resolve the central problems in educating the rural population, much less in providing technical training in agriculture, posing a serious obstacle to national economic development. Major segments of the population have little or no technical training, a situation aggravated by the limited public resources allocated for this purpose.

30. Educational reform is modernizing the educational system to meet the needs of a multilingual, multicultural, and democratic State. Education proposals have also been drafted that include participation, intercultural and bilingual education, and comprehensive, productive education.¹⁰

Internal and External Migration

31. Bolivia's economic situation and the reforms introduced since 1985 have led to a geographic redistribution of the population in the country and to external migration, primarily the relocation of the mining population. A comparison of figures from the National Population and Housing Census of 2001 with those of the 1992 census highlights this trend. They show that 29.54% of the population lived in the plains area, which experienced a 41.3% increase in its population during the period between censuses (1992-2001), translating into a higher rate of growth than in the previous period (4.06% annual average during the period). The altiplano population fell to 41.3% during the same period, retaining only 30.5% of the population increase. Valley areas in turn showed no significant changes with respect to the relative weight of their populations in the national context. According to net migration rates, Pando, Santa Cruz, Tarija, and Cochabamba

¹⁰ Ministry of Education. National Policy on Technical Professional Training for Rural Development. La Paz, 2004.

are the departments that attract population, while Potosí, Oruro, Beni, Chuquisaca and La Paz are viewed to be losing population.¹¹

Coca-cocaine Economic Circuit

32. The impact of the coca-cocaine circuit on Bolivia's economy has lessened considerably as a result of the systematic application of narcotics policies. According to with USAID/Bolivia¹² estimates, in 1988, the economic impact of coca and its illegal derivatives accounted for 9.2% of the GDP, equivalent to 87.3% of its legal exports (US\$ 461 million). By 1998, these figures had been reduced to 2.2% of the GDP and 7.3% of its legal exports. It is estimated that the percentage of GDP declined to 1.4% in 2003.

33. Over the past 15 years, Bolivia has made significant progress advances in the war against drugs, at a high social, political, and economic cost. Fifty-one percent of illegal crops have been eliminated and the cocaine production potential has been reduced some 70%, leading to a new image among the international community, free of the stigma associated with the illicit production and trafficking of drugs. In spite of this progress, there is continued perception that alternative development has had a minimal impact, primarily in terms of mechanisms for implementing programs.

National Agricultural and Rural Development Strategy

34. Systematic analysis of the participatory process for the implementation of ENDAR identified problems, potentialities, and solutions to achieving agricultural and rural development, coinciding with the results of an analysis of over 400 agreements signed between social organizations and different governments between 2000 and 2004. The analysis showed that 60% of production-related demands related to access and legal land tenure, the production infrastructure, credit, training and technical assistance, openness and consolidation of markets, development strategies, and industrialization of agricultural products.

35. The results of the National Dialogue on Production in Bolivia also point out the same problems to be resolved through structural decision-making in the regulatory, institutional, and financing fields.

36. Analysis and interpretation of these results, which can be found in the annexes, shows that ENDAR gives priority to three problems urgently in need of solutions to achieve agricultural and rural development: i) limited market penetration,

¹¹ Study on Domestic Migration in Bolivia. Vargas, M. Technical Secretariat Population Council for Sustainable Development (CODEPO), La Paz, 2004.

¹² Bolivia's Coca/Cocaine Economy in 1998: A Computer Model - July 1999

ii) unemployment and underemployment, and iii) access to and regularization of land tenure.

37. The structural context and three priority problems mentioned were the foundation for ENDAR's objectives, policies, and intervention areas.

38. ENDAR seeks to organize and reorient activities in the rural environment, establishing intervention strategies leading to greater levels of development. Its main objective is to *help improve the income and employment of the agricultural and rural producers,¹³ providing them with the knowledge and means to sustainably and competitively penetrate markets within an inclusive framework of social, cultural, and gender equity.*

39. Penetration of markets is the goal of both the agribusiness sector and producers engaged in traditional production, as well a reference standard for subsistence producers. Helping them meet this goal is a strategic objective of the national government and of the agricultural and rural sector. The specific objectives for meeting this goal are:

- Encourage activities that promote economic, social, and cultural inclusion for campesinos, indigenous people, native people, settlers, and small agricultural producers, employing a gender approach.
- Improve the conditions for domestic livestock products to penetrate domestic and external markets, coordinating productive agricultural and rural processes with domestic and external demand, so that supply is competitive.
- Improve national food security, making food available and accessible to the population and using this channel to reduce malnutrition levels in major segments of the population.
- Create opportunities to improve and diversify the employment and income of the rural population.
- Promote the construction and improvement of productive infrastructure and production support, fostering the competitiveness of production processes and promoting and making efficient public investment in rural electrification, roads, irrigation systems, and other productive infrastructure.

¹³ For purposes of this document, reference to campesinos, indigenous and native peoples, and settlers includes both men and women, recognizing their distinct interests.

- Help grant legal protection of land tenure and permit access to it, maximizing its production and sustainable use.
- Modify the economic and social dynamic created by the excessive production of coca and its illegal derivatives, strengthening comprehensive, participatory, and sustainable socioeconomic development.

Priority Policies

40. The strategies guiding platform of the strategy contains seven priority policy lines:

- a) Development of productive rural, settler, indigenous, and native communities;
- b) Market development, greater productivity and competitiveness;
- c) Food security;
- d) Lands;
- e) Opportunities for nonagricultural income;
- f) Construction and improvement of productive infrastructure;
- g) New alternative development.

41. The *policy of developing productive, campesino, settler, indigenous, and native communities* is geared to promoting productive development with a cultural identity, strengthening intercultural technical education, guiding economic development through self management and gender equity, forming productive organizations, boosting the capacity of productive organizations, and consolidating the opportunities for productive organizations to participate and the mechanisms for marketing products and services.

42. The *development of markets, greater productivity, and competitiveness* is geared to maximizing access to the outside market, developing the domestic market, strengthening the animal health and food safety system, innovation and technology transfer, developing rural technical assistance services, appropriate financial services for the agricultural sector, and strengthening producers' organizations.

43. *Food security policy* seeks to boost agricultural production and productivity to improve the availability of food, to promote the transfer of foods with a high nutritional content, to protect production and national livestock markets, to support the generation of nonagricultural income in dynamic populated centers, to promote the creation of small productive and transformation enterprises, to establish an price and market information system, to implement the National Food and Nutrition Education Strategy, to provide

universal school breakfasts, to offer food subsidies for nursing mothers, and to build a public-private institutional network in support of food security.

44. *Land policy* consists of appropriate regularization and protection of rights to land, access, and sustainable use of land, as well as the link between landholding rights and productive activities.

45. *Policy on opportunities for nonagricultural income* looks to diversify rural income, promote nonagricultural rural employment, and foster comprehensive land development, build local government capacity, and develop dynamic population centers.

46. The *policy line on productive infrastructure and production support* aims to improve irrigation infrastructure, the construction and maintenance of feeder roads, electrification, and rural telecommunications.

47. *New alternative development* seeks to generate conditions for legal crops in coca-growing areas, to support social and economic development in intervention areas, and to make rational and sustainable use of natural resources.

48. At the same time, the following cross-sectional policies are proposed:

- Environmental sustainability and productive use of natural resources;
- Technical training for rural development;
- Rural business training;
- Gender approach for development.

Areas of Intervention

49. The main protagonists of agricultural and rural development are the producers themselves and the economic actors linked with production, marketing, and the transformation of goods and services in the rural environment. Within this framework, the State's role is to promote the activities of these actors and to support their investment, work, and income-generation decisions, ensuring that these activities contribute to food security, poverty reduction, social equity, and ultimately, national development.

50. Application of the strategy will be involve key organizational criteria that will be used to prioritize and/or differentiate interventions in support of the agricultural and livestock and rural sector. These are the operational mechanisms and instruments for applying the seven priority policies outlined in ENDAR for the national, departmental,

and municipal spheres. The intervention modalities cover three areas: i) local economic development, ii) development of agricultural production chains, and iii) the direct transfer of resources to the most depressed communities.

Local Economic Development

51. Local economic development consists of a combined public and private effort with a shared vision of development in a given territory. This will make it possible to establish binding strategies and partnerships to promote concurrent investments, based on shared responsibility agendas and prioritized in departmental and municipal development plans for the purpose of generating income and employment.

Production Chains

52. Their goal is the competitive of national and external markets by domestic products through efficient coordination of actors at each stage of the production process and associated services, until they reach the end consumer, as the determining actor. This approach assumes a certain preexisting level of organization between the links in the chain.

Transfers to Communities

53. This is the process whereby nonreimbursable resources in cash and in kind are granted directly to productive organizations and to campesino, settler, indigenous, and native communities, according to specific standards, so that they make good use of resources and/or execute sustainable productive projects within a framework of social regulation and contributions by the beneficiaries.

Implementation of the Strategy

54. The National Dialogue on Production in Bolivia is beginning to implement ENDAR, by incorporating the local economic development approach proposed by ENDAR into the Municipal Roundtables methodology¹⁴. It focuses on public-private shared responsibility agendas that define the role that each actor should play to promote development.

¹⁴ The 314 municipal roundtables produced a number of results: i) prioritization of up to six potential products or businesses for the municipio, ii) formulation of Comprehensive Production Strategies for each of the potential products or businesses, based on the potential and limitations identified, iii) definition of the roles that the actors involved should play in each of these businesses, iv) proposals for departmental roundtables, and v) proposals for the national roundtable.

55. The National Dialogue on Production in Bolivia at the municipal and departmental levels has prioritized potential products or productive categories for the domestic or external market, so that their success can help improve the conditions and quality of life of the population. As part of this process, nearly 67,750 people¹⁵ were mobilized during the different phases.

56. Some 70% of the Comprehensive Productive Strategies prioritize productive categories linked to the agricultural sector. These results create a vision of a productive country, based on agriculture as a way to fight poverty, social and economic exclusion, and the lack of decent employment and income.

57. This aspect has potential and is the responsibility of MACA and the ministries linked to agricultural and rural development in the country. It falls to them to establish proposals to set up an adequate regulatory, institutional, and fiscal framework, within the framework of ENDAR, to implement Comprehensive Production Strategies.

Local Development in the Municipio of Comanche

58. ENDAR is based on local development experiences that have already been implemented. This process involved the participation of the Aymara peoples, living in semiarid areas in the municipio of Comanche in the department of La Paz. This process began in the late 1980s with the construction of new participatory tools and instruments for consensus-building, with the Development Council of Comanche (CODECO).

59. Aymaras¹⁶ are not only the largest population group in the Bolivian altiplano; they also exercise cultural and political influence, and their decisions influence the country.

60. Improvements in income levels and the quality of life would not have been possible if cultural and ideological changes had not occurred to alter the attitudes of the people of Comanche, laying the groundwork for a sustainable development process that improves current living conditions.

61. An intercultural process was developed in two areas: the recovery of natural resources and productive bases by improving native grazing lands and constructing reservoirs; and the introduction of business administration and management instruments beyond the organizational and political scope of unions.

¹⁵ 42,000 participants in the Pre-Dialogue (Organizations), 3,000 in the Pre-Dialogue (Sectoral), 1,000 in the Pre-Dialogue (FAM), 18,300 in Municipal Roundtables, 2,200 in Departmental Roundtables, 450 in the National Roundtable, and 800 Mobilized Technicians.

¹⁶ The Aymaras have developed survival strategies focusing on four major elements: i) earth and land as an inseparable part of the person, a superior living being, ii) the importance of the large extended family, including unrelated adults close to the family, iii) the domestic production unit, and iv) the philosophy of reciprocity.

62. Thus, it can be seen that increases in income are not solely the result of greater productivity. It can also be seen that the concept of culture includes everything that is not understood. Changes come from human beings and are possible when social capital is given greater value. This process is nothing other than education.

63. This experience was based on several components: i) participatory planning, ii) public-private agreements (Municipio of Comanche—Comanche Rural Office), iii) soil and water recovery and management, and iv) development of livestock and quinoa, canihua (*Chenopodium pallidicaule*), and potato crops.

64. The altiplano is a ecosystem unique in the world, with a wide variety of flora and fauna and great genetic diversity. Natural resources are being degraded in this ecosystem (soil, vegetation, and water), threatening certain animal and plant species with extinction.

65. Soil degradation is the result of natural and manmade erosion estimated at 14 tons per ha per year, for a yearly loss of 11%. This rapid desertification means not only the loss of flora and fauna diversity, but also of soil productive capacity.

66. The diversity of its flora has declined as a result of deforestation (the cutting down of trees for firewood and industrial fuel), overgrazing, the introduction of exotic animals (sheep and cattle) into the ecosystem, the overexploitation of native medicinal plants for commercial use, and severe weather (droughts, frosts, increased UV-B rays).

67. Acculturation in the Aymara and Quechuan social systems has accelerated over the past 40 years, leading to a deterioration in traditional land management and organization. These changes are the result of changes in land tenure, loss of control over ecological affairs, dwindling knowledge about the management and conservation of resources, and the breakdown of indigenous organizations—all leading to ever-worsening poverty.

68. However, these populations show major potential in terms of their land tenure strategies and practices, organization and use of biophysical space, ecologically-based agricultural practices, knowledge, and sustainable technologies, and strong cultural identity that makes a clear contribution to national identity.

69. Local and institutional experiences were recovered and validated in the following activities:

- Identification and establishment of *in situ* germplasm banks, selection and validation of ecotypes;
- Exchange of genetic resources, and conservation and multiplication activities among communities;

- Organization of an exposition, fair, and exchange of germplasm among communities, municipios, and provinces;
- Integration of recovered lands into the productive process;
- Recovery and management of native pastures;
- Implementation of mechanical (infiltration and runoff ditches) and agronomic (fertilizer) practices;
- Gathering and planting of native and introduced seeds;
- Training in technology;
- Implementation of agroforestry systems, and live and dead barriers (terraces);
- Use of water reservoirs to alleviate the lack of this vital element;
- Growth of potato, quinoa, and canihua;
- An education and training proposal based on intellectual and emotional intelligence in an intercultural framework designed to evaluate and gain a better appreciation of their history, traditions, and language, building self-esteem and rejecting discriminatory and alienating educational practices, establishing equal rights and conditions.

70. The educational activity and work designed to change the attitudes of Comanche campesinos and to recover productive bases showed that the combination of Andean and western technology generates a cultural diversity curve that tends to improve crop productivity. This system resulted in a 200 to 6,000 kg per ha increase in the production of dry matter.


