

Livelihood diversification in Aymara Communities of the Altiplano



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Introduction



- The Altiplano (high plain) is the region where the Andes chain becomes widest and presents extensive area of high plateau.
- Aymara are main native ethnic group in the Altiplano, with 1.2 million in Bolivia and 300,000 in Peru.
- Aymara households build livelihoods according to specific agroecological conditions of the Altiplano, and an unique cultural, social and political environment for generating income and ensuring food security.

Introduction (cont.)

- Aymara households/communities have demonstrated through time to have high resilience in adapting to environmental, social, political and economic changes.
- The great capability of Aymara to adapt their livelihoods to constant changes through time and maintain their cultural practices is based on the use of diversification in making livelihoods strategies.
- Environmental degradation, climate change and new market conditions are challenging the resilient capacity of Aymara.
- Livelihood diversification is defined as the all different ways in which households integrate and combine assets and activities using their capabilities and opportunities to come up with diverse livelihood strategies for poverty alleviation and to improve their standard of living.

Objective

To understand why Aymara households use diversification as a livelihood strategy.

Questions

Research question

- Why do Altiplano households use diversification as a livelihood strategy?

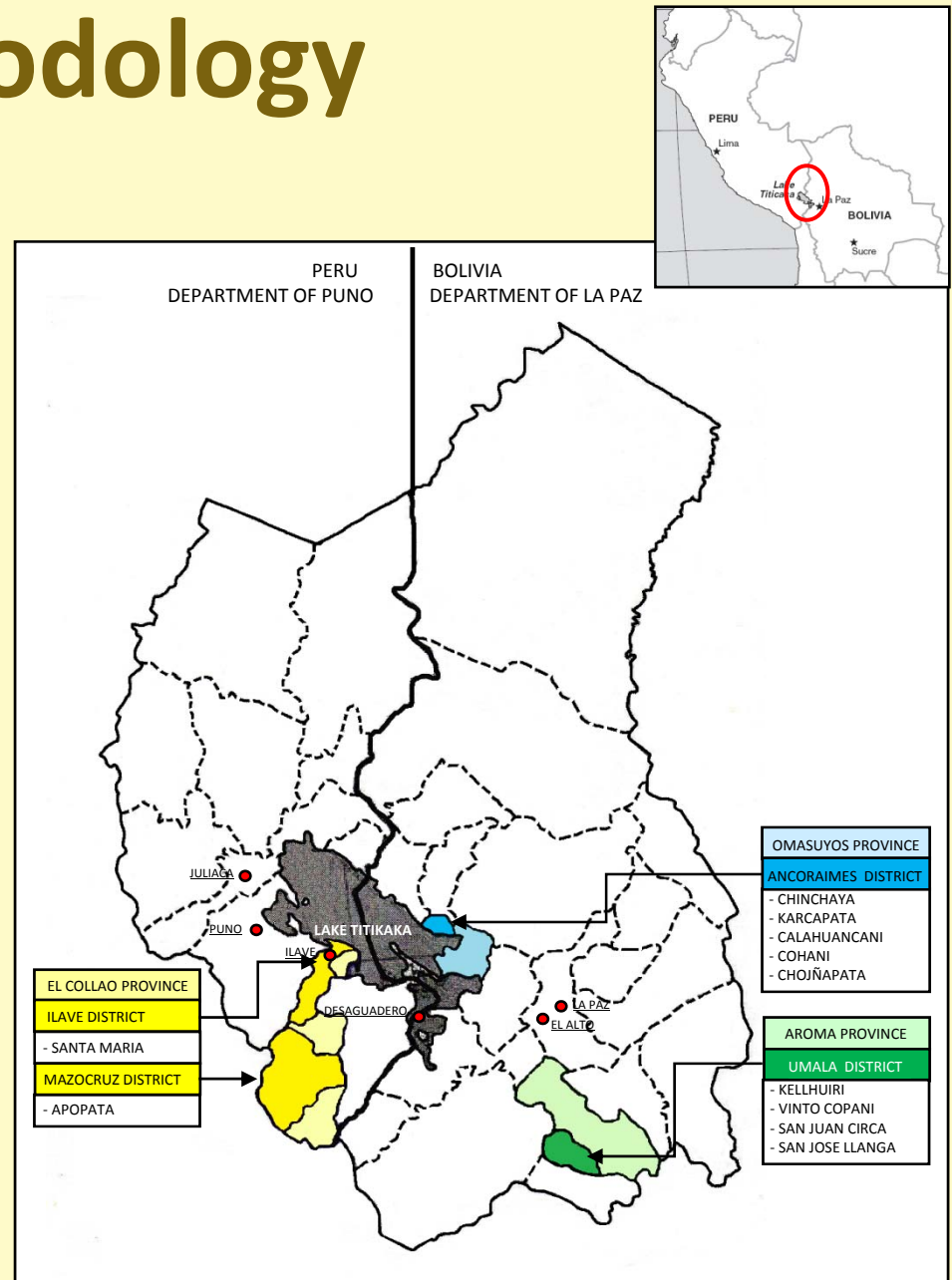
Sub-questions

- Which are the assets and activities that Altiplano households use to diversify livelihoods?
- How do Altiplano households use labor to combine assets and activities to come up with diverse livelihoods?
- What are the factors that influence their decision to diversify livelihoods?

Methodology

Data collection

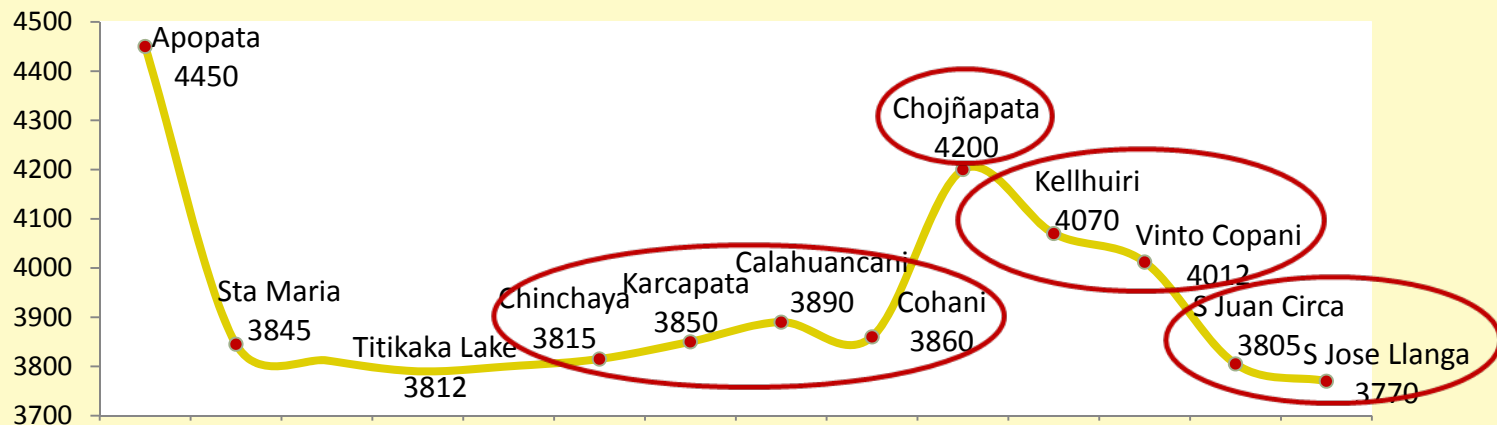
- SANREM Andes/USAID
- September 2006
- 11 communities (9 BO, 2PE)
- Questionnaire about livelihoods (demographics, crop and livestock production, commercialization, biodiversity, food consumption, risk perception)
- Bolivian data: 330 households, 9 communities, 2 municipalities (Ancoraimes and Umala)



Methodology (cont.)

Data analysis

- Data was organized in groups according to 4 microclimates, which are based on altitude and distance to lake Titikaka
 - 1: Chinchaya, Karcapata, Calahuancani, Cohani;
 - 2: S.J. Circa, S.J.Llanga;
 - 3: Kellhuiri, Vinto Copani;
 - 4: Chojñapata



Methodology (cont.)

- 47 variables
- T-test to compare municipalities
- ANOVA to make comparisons across microclimates
- OLS Regression of diversification on assets and activities

Livelihood Diversification

ASSETS

HUMAN / CULTURAL

- Labor: familiar, shared (ayni, minka) hired
- Knowledge: local and new (education, training)
- Languages (Aymara and Spanish)

NATURAL

- Land holdings
- Animals: cattle, sheep, camelids, pigs, birds, cuy, rabbits
- Crops : potato, quinua, arveja, haba, papaliza, oca, cañahua, tarwi, isano, onions, wheat, turnip
- Forages : alfalfa, barley, oat
- Land use: cropland (plat, fallow, preparation), grassland
- Fuel: thola, sheep and cattle manure
- Fertilizer: manure
- Crop harvest
- Animal production: milk, meat, wool, fiber
- transformed products: chuño, tunta, caya, cheese
- Soil fertility
- Grassland productivity

SOCIAL

- Networks
- Organizations (internal, external)
- Information (climate, market, technological)

FINANCIAL

- Cash income (sales, salary, credits, remittances)



ACTIVITIES

- Agriculture
- Livestock
- Transformation
- Handicraft
- Sales
- Exchange
- Consumption
- Gifts
- Off farm work
- Migration
- Participation

Framework for analysis

- Mode of production
- Focus on activities involving members of the household
- Hypothesis: Altiplano households use diversification to adapt to the demands of available labor.

Variables

- Variables taken from questionnaire
 - Farm Size & Access to land
 - Distance to Market
 - Participation
 - Sources of information about markets
- Variables calculated from questionnaire
 - Available labor and Labor to land ratio
 - Family and Shared labor
 - Diversification of distribution activities

Comparison of means by municipalities and microclimates

Variable	Ancoraimes	Umala	<i>t-test</i>	Mclimate1	Mclimate2	Mclimate3	Mclimate4	Log	<i>F</i>
EDUCATION	2.09	2.26	-1.827 *	2.13	2.35	2.04	1.93		1.340
AGE_HEAD_HOUSEHOLD	48.28	49.95	-.957	47.80	49.24	51.61	50.48		.043
FARMSIZE	.94	6.91	-12.838 ***	1.00	7.64	5.20	.65	x	38.358 ***
FALLOW	.62	.88	-5.624 ***						
AVAILABLE_LABOR	3.31	4.12	-3.944 ***	3.28	4.04	4.29	3.43	x	.379
AV_LABOR_PLANTED_LAND_RATIO	10.93	2.33	8.560 ***	10.35	1.33	4.67	13.57	x	40.407 ***
POTATO_PRODUCTIVITY	486.56	361.18	6.514 ***	492.58	374.77	329.24	459.38	x	7.214 ***
CRIOLLO_SHEEP	18.03	11.69	1.752 *						
IMPROVED_SHEEP	.03	12.97	-7.200 ***						
CRIOLLO_CATTLE	2.58	1.82	2.629 ***	2.44	1.38	2.87	3.19	x	5.533 ***
IMPROVED_CATTLE	.10	3.51	-10.413 ***						
PIGS	1.68	.10	7.765 ***						
CAMELIDS	6.09	.40	2.943 ***						
CRIOLLO_SHEEP_OTHERS	1.94	.20	2.129 **						
IMPROVED_SHEEP_OTHERS	.00	.61	-1.913 *						
CRIOLLO_CATTLE_OTHERS	.05	.04	.525						
IMPROVED_CATTLE_OTHERS	.00	.14	-2.195 **						
DISTANCE_TO_MARKET	1.86	.83	7.204 ***						
PURCHASES	1.25	.80	5.457 ***						
PARTICIPATION	.97	1.51	-4.496 ***	.97	1.48	1.57	.96		1.970
IRRIGATION	.60	.09	5.103 ***						
TRACTOR	.54	1.93	-9.167 ***						
ABONO	.54	.56	.969						
FERTILIZER	.54	.56	.969						
INCOME	22875.57	25526.86	-.642	19331.77	30504.74	13819.60	38888.30	x	9.707 ***
PROPORTION_OF_INCOME_LABOR	.12	.07	2.295 **						
PROPORTION_OF_INCOME_AG	.83	.90	-2.664 ***						
PROPORTION_OF_INCOME_RENT_REMIT	.05	.03	1.597						
PROPORTION_OF_INCOME_THOLA_CRAFTS	.00	.00	-1.166						
DIVERSIFICATION_OF_DISTRIBUTION	14.15	24.41	-12.097 ***	13.62	25.49	21.87	16.52		19.709 ***
ACCESS_LAND_RICHNESS	.05	.17	-2.700 ***						
FAMILY_LABOR_RICHNESS	12.25	5.52	17.341 ***	12.82	5.12	6.46	9.67		17.718 ***
HIRED_LABOR_RICHNESS	.93	1.06	-.763						
SHARED_LABOR_RICHNESS	3.17	.54	22.706 ***						
RESERVE_RICHNESS	2.51	1.03	20.180 ***						
SOURCES_MARKET_INFO_RICHNESS	3.04	1.78	8.042 ***	3.05	1.92	1.44	3.00		9.604 ***
ALT_SOURCE_INC_RICHNESS	.57	.75	-3.917						

Estimation of use of labor and diversification

	FAMILY LABOR	SHARED LABOR	DIVERSIFICATION
(Constant)	1.595	-1.262	2.669 ***
HOUSEHOLD_SIZE	.483 ***	-.143 ***	.005
AVAILABLE_LABOR	.212	-.116	.029 **
DIVERSIFACTION_DISTRIBUTION	.027	-.011	
FARMSIZE	.016	-.010	.004
AGE_HEAD_HOUSEHOLD	-.003	-.002	.000
MALE_HH	.753	-.183	-.004
EDUCATION	-.264	.091	.053
DISTANCE_TO_MARKET	.178	.031	-.019
AV_LABOR_PLANTED_LAND_RATIO	-.131 ***	.056 ***	-.015 ***
POTATO_PRODUCTIVITY	.002	.000	.000
ACCESS_LAND_RICHNESS	-2.420 ***	.249	.157 **
FAMILY_LABOR_RICHNESS		.238 ***	.019 **
HIRED_LABOR_RICHNESS	.139	-.049	.002
SHARED_LABOR_RICHNESS	1.877 ***		-.043 **
RESERVE_RICHNESS	.077	.251	.013
PURCHASES	.845 ***	-.111	.014
SOURCES_MARKET_INFO_RICHNESS	.228	.081	.007
MICROCLIMATE	-1.163 ***	.344 **	.150 ***
PARTICIPATION	-.212	.079	-.014
SPOUSE_SPEAK_UNDERSTAND_SPANISH	-.576	.031	-.012
IRRIGATION	-.393	.276 ***	.001
TRACTOR	-.520	.128	.066 ***
FERTILIZER	1.535 ***	-.243	-.003
ALT_SOURCE_INC_RICHNESS	-.519	.317 *	.093 **
LAND_DISTRIBUTION	.214	-.188	.074
INCOME_LOG	.392	.005	-.096 ***
CRIOLLO_SHEEP	.030 *	-.005	.004 ***
IMPROVED_SHEEP	-.008	-.003	.004 ***
CRIOLLO_CATTLE	-.200	.117 **	.008
IMPROVED_CATTLE	-.152	.017	.027 ***
CRIOLLO_CATTLE_OTHERS	-2.516 ***	.562 **	.031
R Square	.872	.875	.688
F-stat	11.193 ***	11.502 ***	10.668 ***

Conclusions

- We can not say that diversification is a strategy to mitigate the demand of household labor.
- Family labor is positive related to other forms of diversification.
- Households with to access criollo cattle (own and others) access more shared labor.
- Households that have increased access to land and animals are more diverse in distribution activities.
- Microclimate is significant in determining the amount of diversification, but other factors like distance to market and participation did not show expected results.

questions?