



Seasonality Revisited

Perspectives on Seasonal Poverty



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**Off-farm work in the Peruvian Altiplano:
Seasonal and geographic considerations
for agricultural and development policies**

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Seasonal and geographic considerations for agricultural and development policies

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Abstract

The Peruvian Altiplano presents different agro-ecological zones and variable climatic conditions. Rural households of the Altiplano from the ethnic Aymara define their livelihoods and strategies according to those natural conditions. Agricultural households of the lakeside zone, with less variable climatic conditions and closer to market places, are mixed-farming consumption and market-oriented, who intensify their agricultural activities at the beginning of the rainy season for the sowing and at the beginning of the dry season for the harvest. Alpaca pastoralist households of the dry *puna* zone, with less favourable climatic conditions and located in remote areas, are exclusively grazing livestock market-oriented, who intensify their agricultural activities during the rainy season when grasslands are more readily available. Seasonality and spatial location condition their on-farm labour demands but also their off-farm labour availability. In general, mostly male members with more access to education and better command of the Spanish language from households with more access to land and animal holdings, improved animals, forage sources and hired labour are those who go more for off-farm work in both zones. Both agricultural and pastoralist households go for off-farm work during the dry season but because of the uncertain conditions of the labour market they can also go during the year. Agriculture, construction and commerce are the main sectors in which they supply their labour. However, households from the lakeside zone with more access to markets and better infrastructure conditions supply their labour in cities of the region, different from dry *puna* households who go to cities from the coastal region. Pastoral households, because they lack food storage and have considerably fewer market opportunities, are more vulnerable for food security and therefore more flexible in engaging in different activities and choosing their destination when going for off-farm work. Greater absence of key decision-makers from the household and community weaken communal organisation and burden women and children who remain on-farm, especially in the dry *puna* zone. Climate and (labour) market variability also stress household's decisions causing an intensified use of natural resources which leads to soil erosion in the lakeside zone and to degradation of rangelands in the dry *puna* zone. These are considered push factors for off-farm work, along with limited access to education and little market development in rural areas of the Altiplano. Agricultural industry development in the coastal region encouraged by export-oriented agricultural governmental policy is considered a pull factor. Agricultural and development policies are focused more on articulating rural households to the global market economy rather than to developing local markets. These policies have failed to include seasonal labour variability and geographic differentiation at the moment to facilitate on-farm and off-farm opportunities, marginalising the poorest households of the region. Households from the dry *puna* zone present different demands that should be reconsidered in development and poverty alleviation efforts. Therefore, understanding off-farm work patterns in the different agro-ecological zones at determinate seasons could improve development and poverty alleviation efforts as well as enlighten policy for the Altiplano region.

Introduction

Rural households define their livelihoods according to specific geographic and climatic conditions, as well as the specific social and cultural context. In the Peruvian Altiplano, the major livelihoods of households of the ethnic Aymara of the lower zones practice mixed agriculture and those from the higher zones are exclusively involved in livestock. Similarly, the two marked different seasons also play a determinant role at the moment of defining on-farm livelihoods strategies, especially at the moment of defining the agricultural calendar and the allocation of labour. During the rainy season, on-farm activities are more intensive than in the dry season and therefore households have higher on-farm labour demands. Rural households from the Altiplano are among the poorest of the country. In order to deal with poverty they diversify their activities for income generation, but they also diversify when they want to improve their living conditions. Diversification opportunities are not only conditioned by labour availability but also by the different agro-ecological zones, because the higher the altitude the lower opportunities for diversification. Thus, off-farm work becomes an important livelihood strategy among Altiplano households which is conditioned by on-farm labour needs but also by labour market opportunities. Both seasonality and geographic dispersion also condition off-farm work opportunities especially at the moment of making decisions about when and where to go for off-farm work. Moreover, because of the informality of the labour market conditions Altiplano households have to consider seasonal and geographic variability when deciding whether to go for off-farm work. The increase in off-farm work opportunities has been encouraged by policies as a strategy for poverty alleviation. Thus the better understanding of off-farm work seasonal trends in a specific region can bring new insights for policy in the Altiplano region. Therefore, the objective of this study is to analyse off-farm work patterns according to seasonal variation in two rural communities from two different agro-ecological zones of the Peruvian Altiplano.

This paper is organised in 7 sections. The second section presents a brief literature review of seasonality and geographic dispersion. The third section describes the seasons and geographic conditions of the Altiplano. Section four provides a brief review of agricultural and development policy and its impact on rural households of the Andes. The fifth section describes the source of empirical information. Section six presents the findings of the study, and finally section seven presents the conclusions and some recommendations.

Seasonality and geographic dispersion

Seasonality and geographic dispersion have been studied by many scholars especially for policy purposes. In analysing rural livelihoods and diversity in developing countries, Ellis (2000) states that seasonality is a determining factor of livelihood strategies because it defines production cycles of crops and the livestock calendar but also because households arrange crop and livestock cycles according to seasons. In economic terms, seasonality means that returns to labour time vary during the year in both on-farm and off-farm labour markets. On-farm, because there are periods of intensive use of labour like in the planting and harvest seasons. If off-farm activities are related to agriculture, there are also periods of intensive demand of labour that accord with seasonality. Further, due to seasonality, a household's

consumption fluctuates during the year and in response to that households diversify. Thus, one way to diversify income is getting off-farm work which includes all activities that households get involved in outside of their own farm. Ellis uses the term migration to refer to off-farm work which happens when one or more family members leave the resident household for varying periods of time to be able to make new and different contributions to its welfare (Ellis, 2000). Thus Ellis identified temporary seasonal migration when it depends on the agricultural season or calendar, and temporary circular migration when it responds to cyclical needs for labour in non-farm markets. He also identified permanent and international migrations, which imply a periodic or long duration of work including residence in another place; the first is within national borders and the latter is abroad. The causes of migration and off-farm work can be organised as push and pull factors. Within push factors are seasonality, risk, market failures, erosion assets, landlessness and disasters, and within the pull factors are income differentials (Ellis 2000).

Seasonality, however, is not the only factor that conditions off-farm work opportunities of rural households. Reardon *et al.* (1992), studying the determinants and effects of household income diversification patterns in three agro-ecological zones in Burkina Faso found that the Sahelian and Sudanian households, with unfavourable agro-climatic conditions and less agricultural development, have fewer opportunities for wage labour and self-employment off-farm than Guinean zones, with more favourable agro-climatic conditions. Thus policy interested in promoting non-farm activities should consider both seasonality and geographic dispersion.

Timmer (in Eicher and Staatz, 1998) argues that policy makers when designing macro-policies have failed to incorporate the natural as well as social characteristics of agricultural production due to their little or limited understanding of how agriculture functions in different countries. Within the natural characteristics are seasonality and geographical dispersion, and within the social ones are the different decision makers in the household and the dual behaviour of farmers as producers and consumers. Timmer also argues that to reduce seasonal bottlenecks two important features of seasonality should be considered in designing agricultural policy. Those are the appropriate provision of inputs when and where they are needed, and in the full analysis of the social impact on agricultural production of private investment. Geographical dispersion and remoteness of rural household limit the access to developed markets (labour and credit) increasing transaction cost. In addition seasonality could also increase transaction cost even more during specific periods of the year. Thus, seasonality and geographical dispersion should be considered in policy design and government interventions when developing market services (in Eicher and Staatz 1998).

Seasonality and geographic dispersion in the Peruvian Altiplano

The Peruvian Altiplano presents three agro-ecological zones based on altitude and distance from the lake Titikaka: Lakeside, Suni and Dry *puna* (table 1). The Lakeside agro-ecological zone surrounds the lake. It is flat and presents productive alluvial soils where annual crops such as potato, quinoa, barley, oats, and alfalfa are raised yearly with no break for fallow. Livestock are fed since grazing area is limited. Although this zone is subject to flooding from the lake, its position makes it less subject to drought and frosts that afflict farming at the higher altitudes. Moving up and away from the lake, the Suni zone is one of transition from

farming, where crop farming prevails, and extensive livestock grazing. Annual rainfall and the number of frost-free months are both lower in the Suni zones than in the lakeside zone, resulting in less intensive crop production and a shift from fed livestock by the lake to grazed livestock in the Suni zone. Above 4,500 meters of altitude, the dry *puna* zone offers less than three months without overnight frosts and less than 600mm of rainfall on the southwest side of the Lake. Farming is almost exclusively the extensive grazing of alpacas, sheep, llamas, and cattle (Swinton and Quiroz, 2003). In terms of vulnerability, the lakeside and Suni zones are considered less vulnerable than the dry *puna* because conditions are more favourable for agriculture. Households located on dry *puna* zone only depend on rangelands to make their living. Households from lakeside and suni zones can store some food from agricultural production for the critical pre-harvest season. Households from dry *puna* lack food storage opportunities and are more vulnerable to climate changes. This condition can be considered as a push factor for off-farm work in this zone differently from the other two zones in the Altiplano region.

The Altiplano region presents two marked seasons: the rainy and the dry season. The rainy season goes from November to March, however precipitation concentrates during two months, January and February. During this season the relative humidity increases and the extreme temperatures register less variability. Day time is longer during this season too. The dry season starts in April and ends by October. The last two months of the dry season (Sep and Oct) are critical months, especially for animals in the highest altitude because almost no forages and few or no water sources are available. This season presents more variation of temperature and it registers peaks of higher and lower temperature. Moreover, the dry season is when frost and hail have more chances to occur. Thus, seasonality affects the different agro-ecological zones in different ways.

Table 1. Agro-ecological zones of the Peruvian Altiplano

Agro-ecological zone	Altitude (m)	Precipitation (mm/year)	Frost-free period (days/year)
Lakeside	3800-3900	700-750	150-180
Suni	3850-4000	600-850	90-145
Dry <i>Puna</i>	4000-4800	440-600	30-60

Source: Tapia, 1996 in Swinton and Quiroz, 2003.

Agricultural and Rural Development Policy in Peru

After the structural adjustment programme and liberalisation of the economy, it was expected that individual farmers and service providers related to the sector would compete with each other in the market and improve productivity to generate higher incomes. However, except for a small agro-export sector, the liberalising reform has not brought the expected outcome in Peruvian agriculture. Poverty is still persistent in the rural sector, and agricultural production, especially food production by small-scale farmers from the Andes, has stagnated. The expansion of agro-industry did not contribute either to the expansion of the small-scale agriculture as was expected because it encouraged dependence on cheap imported material (wheat and corn) rather than local production. Thus, the expansion of demand for bread,

canned milk and chicken meat did not increase demand for national agricultural products. Moreover, the opening of the domestic market to cheap imported food not only changed the preference of people towards certain foods but it also increased the competition of small-scale farmers' products with cheap imported food. This also discouraged small-scale farmers from engaging in commercial farming, and encouraged them to continue producing for self-consumption and for local markets. Other discouraging factors in the rural sector are reduced small-scale land holding, an almost non-existent market for land and credit, and a general lack of logistic infrastructure that increases the cost of distribution of agricultural products and lowers the prices farmers receive. Thus, the capitalist sector cannot absorb all the excess rural labour force, not only for the lack of conditions but also because it will not be able to expand agricultural production to rural areas because of unfavourable climate and soil conditions for commercial farming. Furthermore, there is a political barrier against pushing small-scale farmers off their lands.

One of the given conditions for Peruvian agriculture is diversity of climate and geographical conditions. This diversity is often cited as an advantage for Peruvian agriculture, saying that many kinds of crops can be cultivated at any time of the year in Peru. However, excess diversity of natural conditions often does fail to help develop commercial farming because it prevents taking advantage of economies of scale. Thus, rational small-scale farmers continue mixed agricultural production rather than specialising into a few commercial crops. Their priority is to produce for their own consumption, rather than to sell their crops in markets. In other words, maximisation of average income, rather than that of marginal profit, is very rational in order to keep a subsistent level of income. In spite of decades of agricultural development, past policies have failed due to their focus on connecting small-scale farmers to the global economy. The government, international cooperation agencies and non-governmental organisations continue seeking development strategies for small-scale farmers, presupposing a liberalised economy (Shimizu, 2003). Just recently, once more the government has launched a development plan to articulate small-scale farmers from the rural sector of the Andes with the international market, without considering any structural change in the policies and physical infrastructure. Seasonality and geographic dispersion therefore were not taken into account in the development plan.

SANREM project in the Altiplano

The ongoing project "Adapting to climate and market changes in the Altiplano" from the Sustainable Agriculture and Natural Resources Management (SANREM) programme sponsored by USAID, has been operating in the Peruvian Altiplano since 2006, to increase the resilience of Aymara households to deal with climate and market changes. During years 2006 and 2007 information was collected through the use of questionnaires, participatory workshops and focus groups about their livelihoods strategies and perceptions of changes. One hundred and fifteen questionnaires were administered to 48 rural households from the Community of Santa Maria and to 67 rural households of the Community of Apopata, communities that are representative of the lakeside agro-ecological zone and dry *puna* zone respectively. Data used for this analysis consists in quantitative and qualitative information about demographics, access to resources and livelihood strategies. Head of the households

were asked about when, where and how they were compensated for off-farm work. Looking for some associations and patterns among variables, frequencies and crosstab tests were used to analyse the data. The information was complemented with previous studies in the same agro-ecological zones. For the purposes of this study, off-farm work is defined as any type of activity in which a member of a rural household gets involved in an income generation activity that is out of own farm and for a small period of time. Migration implies a permanent absence from the household and was not considered here.

The community of Santa Maria belongs to the ethnic group Aymara, it is situated at around 3,850 meters of altitude and close to the lake Titikaka, and it belongs to the lakeside agro-ecological zone. Thus the predominant agricultural system is mixed farming. The cropping system in the community of Santa Maria is rain-fed and the main crops are potato, quinoa, fava bean, barley and alfalfa. The main livestock animals are dairy and sheep. Due to its geographic location Santa Maria is close to important market-places. The city of Ilave, situated within walking distance from Santa Maria, is the main Aymara market. This means there are more labour market opportunities for Santa Maria and, therefore, there are more options for income diversification. The main destination of crop production is consumption, and the main destination of livestock production is the market, meaning that they do not depend totally on the market for food security. Within the main livelihood strategies for Santa Maria are agriculture, commerce and self-employment. On-farm labour for Santa Maria intensifies during May, June, September, October, and November, as is detailed in the agricultural calendar below. Santa Maria practices agricultural and income diversification as livelihood strategies, and these include off-farm work.

The Aymara community of Apopata is situated within 4,000 and 4,500 meters of altitude and far from the Lake Titikaka and it belongs to the dry *puna* agro-ecological zone. At this zone the cultivation of crops is not possible, and therefore rain-fed extensive grazing of livestock is the only production system. The main livestock are alpaca, lama, and sheep. Due to its geographic location Apopata is situated in remote area, far from market places. The closest rural town is about one hour walking distance from Apopata, however the market there is not well developed. This also means that there are few labour market opportunities for Apopata. The main and exclusive destination of livestock production is the market, meaning that Apopata depends totally on the market for food security and has fewer options for income diversification. The main livelihood strategy for Apopata is alpaca fibre production. Livestock production presents a demand for on-farm labour intensification during January, February, March, September and November. With very few options for on-farm diversification, Apopata has to go to look for other sources for income diversification, including off-farm work.

Off-farm work trends in the Altiplano

Exploring the information it was found that 41.7% of households in Santa Maria and 34.3% of households in Apopata use off-farm work as a livelihood strategy for income generation. Other livelihood strategies of those households from Santa Maria who go for off-farm work are mixed farm (cropping-livestock), commerce, self employment, cropping and livestock production. This is in contrast to households from Apopata, who depend exclusively on

livestock production. Within the characteristics of the households who go for off-farm work, men are more likely to go for off-farm work than women, older people are less likely to go for off-farm work than younger people, the higher their education the more likely they are to go for off-farm work, the better the command of Spanish as second language the more likely to go for off-farm work, the bigger the land-size holding the more likely to go for off-farm work, the more cattle owned the less likely the person is to go for off-farm work, the more improved sheep owned the more likely to go for off-farm work, the more access to forage sources the more likely the person is to go for off-farm work, the more access to hired labour the more likely to go for off-farm work, the greater the household income the more likely to go for off-farm work, and the more the household trusts the communal organisation the less likely to go for off-farm work. Households that have access to *ayni* (inter-household shared labour practice) are also more likely to go for off-farm work. Thus, we can say that the wealthier the households the more they leave for off-farm work. Poorer households in both communities remain in the communities supplying their labour to those households who go for off-farm work.

In relation of the season of the year, Santa Maria and Apopata households present different patterns on the time of the year when they go for off-farm work. Santa Maria households are more willing to go for off-farm work during the second half of the calendar year, which coincides with their agricultural seasons of fallow and land preparation and planting seasons. Most of the households in Apopata go for off-farm work any time of the year, no matter if it interferes with the livestock seasons of high intensive on-farm work. However we observe that none of the households go for off-farm work during the harvest season in Santa Maria (May and June) and households in Apopata try to avoid off-farm work during the mating and birth season of the alpaca herd (January, February, March) and the alpaca pregnancy detection season (September, October, November). This pattern can be explained by the harvest seasons because in both communities the harvest (either of crops or animals) and other activities directly related to ensure the quality of the harvest are important and determinant when going for off-farm work.

The destinations for off work for Santa Maria households are: Tacna, Ilave, Puno, Arequipa, Moquegua, Lima, Cusco, Desaguadero, and other nearby communities. Destinations for off-farm work for Apopata are: Tacna, Mazocruz, Ilave, Puno, and Moquegua. Santa Maria has more options of places to go for off-farm work than Apopata. Santa Maria not only has more options for off-farm work but also goes to more distant places than Apopata. Thus we found that the main places to go for off-farm work for Santa Maria are Tacna, Ilave and Puno and the main places for Apopata are Tacna, Mazocruz, and Ilave. Tacna and Ilave are destinations shared by both communities; however, Tacna is closer to Apopata and far from Santa Maria. Ilave, as described before is a market-place within walking distance from Santa Maria but far from Apopata. Mazocruz is a rural small town close to Apopata with a little developed market. The city of Puno is close to Santa Maria and far from Apopata. In the same way those households from Santa Mara who go for off-farm work are wealthier than Apopata households because they can afford going a long distance to supply their labour. Activities in which Santa Maria households get involved when they go for off-farm work are agriculture, commerce, construction, transport, and services. Activities in which Apopata households get involve when they go for off-farm work are the same as

Santa Maria with the additions of education and mining. In general both communities are involved mainly in agricultural activities. Commerce and construction are the two most important and common activities. Santa Maria presents fewer options for off-farm work than Apopata, who seems to be more flexible to get involved in any type of job. The skills of the people of Santa Maria in agriculture and value-added activities could be making the difference from Apopata at the moment of deciding whether to supply labour in the market.

Looking for the effect of seasonal patterns of off-farm work across agro-ecological zones we found that the coastal city of Tacna as a destination for off-farm work is more important for Santa Maria from July to March and for Apopata from April to June. The city of Ilave as a destination is more important for Santa Maria from July to December and for Apopata from May to June. The activities in which they get involved are also defined by seasonality. Santa Maria works in agriculture as off-farm work from July to December but also can go any time when it is needed. Apopata works in agricultural activities for off-farm work and in construction from April to June; but they are also available any time of the year or during the whole year. Since Tacna is a city where industrial export-oriented agriculture is growing it could be easy to assume that Santa Maria and Apopata households go there exclusively to work in agriculture. Indeed, households from both communities do go to Tacna to work in agriculture, but not all of them. A considerable group also goes for commercial purposes and others go to work in construction. More households from Santa Maria go to Ilave to work in agriculture but some also work in construction. Apopata households go to Ilave more for commercial purposes. As was shown above, in general in both communities women have less access for off-farm work. The few women of Santa Maria that go for off-farm work do so from July to September or anytime of the year. The main place they go for off-farm work is Tacna, Ilave and in another nearby community. The main activities they are involved in are commerce and agriculture. In the case of Apopata, the few women that go for off-farm work can go anytime of the year, and they go only to Tacna to work in commerce or in construction.

Conclusions and Recommendations

As we can see, seasonal patterns of off-farm work can be different or similar across both lakeside and dry *puna* agro-ecological zones. When looking at the broad data we can say that households of both agro-ecological zones have similar patterns, get involved in many of the same activities and go to the same places at different times of the year. However when looking at the details of the data we find that even when they go to the same places and get involved almost in the same activities they do so at different times of the year, according to their agricultural calendars. In looking for the characteristics of those who go for off-farm work, it was found that in both agro-ecological zones mostly the wealthy households, those with access to education and better command of the Spanish language, land and animal holdings, forage, improved animals and hired labour, are those who go for off-farm work. The poorest remain in the community to work for other farms of the community. Development agencies should consider including in their activities those people who remain in the community providing labour, because they have less opportunities for income generations through off-farm work.

The off-farm work season is defined by the agricultural calendar that households of both agro-ecological zones have developed. However the main group of households that go for off-farm work declared that they mostly go any time of the year, denoting the uncertain environment that households deal with when deciding whether to go for off-farm work or remain in the community to work on their own farm. There is a season when households neither from the lakeside zone nor the dry *puna* zone go for off-farm work. The harvest season for households of the lakeside zone (May and June) and the alpaca birth season for households of the dry *puna* zone (January to March). It is important to consider that those agricultural seasons, harvest and alpaca birth, are extremely important on-farm activities that happens in different season of the calendar year for the Altiplano region. Local market development efforts should consider this difference in order to facilitate sales at the right time. There are also different patterns in the places where households from both agro-ecological zones go for off-farm work. Households from the lakeside zone go longer distances and to more places. Households from the dry *puna* zone travel shorter distances and to fewer places. There is a need to develop local markets in order to provide job opportunities in the region to reduce the transaction costs of households when going to distant places for off-farm work. Despite the different destinations for off-farm work among households of both agro-ecological zones, they coincide in two important places for the labour market in the Altiplano region: the southern city of Tacna out of the region, and the Aymara city of Ilave in the same region. Policies that encourage the increase of job opportunities for poverty alleviation should consider concentrating efforts to encourage the development of the local market like Ilave to reduce transaction costs of households who have to go out of the region in looking for job opportunities.

Types of activities in which households from both agrological zones get involved in as off-farm work are similar but present different patterns. Thus, the main activities in which households from both agro-ecological zones engage when going for off-farm work are agriculture, commerce and construction. However households from the lakeside zone engage in fewer activities while households from the dry *puna* engage in a diverse range of activities, meaning that households from the dry *puna* are more flexible in getting involved in off-farm work due different work skills. The creation of job opportunities in the region should consider evaluating the existing skills of people there.

Final considerations for policy development are that access to education, development of local markets, improved labour market conditions at local level, and infrastructure development continue being postponed for the Altiplano region. Governmental and non-governmental organisations continue to fail in incorporating seasonal patterns and geographic dispersion when carrying out their activities. There is a need to pay special attention to women and children from the dry *puna* zone and to facilitate more jobs and market and education opportunities for those households from the dry zone due to their remoteness and inaccessibility, and their unique agricultural calendar. Research and development efforts should consider that seasonality affects the labour availability at the moment of providing help. All have to be careful who they provide the help in order to include everybody and do not favour the wealthy households.

Government still needs to work on facilitating the construction of roads and the provision of social services to enhance agricultural investment and efforts aimed at job

creation in the region. Another necessary strategy is the development of local markets rather than increasing efforts to insert small-scale poor households in the export market. Research and development should pay more attention to the upper and more vulnerable area of the highlands rather than lower lands where households are more resilient.

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