HUMAN REVIEW | Vol. 21, No. 1, 2023 | ISSN 2695-9623
International Humanities Review / Revista Internacional de Humanidades
https://doi.org/10.37467/revhuman.v21.5043

RURAL COMMUNICATION IN PRODUCTIVE INNOVATION PROCESSES PHYSALIS PERUVIANA AGUAYMANTO IN AREQUIPA

GREGORIO NICOLAS CUSIHUAMÁN-SISA, DENIS PILARES FIGUEROA, RONNY VALDIGLESIAS CALVO, EDGARD ANTONY CRUZ ZEVALLOS

Universidad Nacional de San Agustín de Arequipa, Peru

KEYWORDS

Rural communication
Productive innovation
Depopulation
Golden gooseberry
Territoriality
Communication barriers
Value chain

ABSTRACT

This is the result of research financed by PROCIENCIA-CONCYTEC, whose objective is to analyze the rural communication forms in the processes of productive innovation and the positioning of the aguaymanto as a native product of the Peruvian Andes, to propose communication strategies in rural sectors of Arequipa, physalis peruviana is a fruit of Andean origin, whose properties and characteristics surpass other similar fruits; the method of analysis is qualitative-quantitative, of the correlational, transectional type, the exploration is carried out in five rural districts of Arequipa, applying 125 surveys and 10 interviews.

Received: 05/ 05 / 2023
Accepted: 24/ 07 / 2023

1. Introduction

The impact of poverty in rural sectors in Latin America has generated a worsening of poverty, and several articles agree with this statement: "Poverty traps, aggravated by the unequal distribution of these services, generate situations of socio-environmental conflicts. As a result, the territories suffer socioeconomic and environmental transformations that affect their development, and further entrench poverty" (Rubilar Donoso et al., 2022, p. 69), another factor that transcended in this development is the lack of scientific research in the rural sector, which would allow consistent proposals, "neither in Argentina nor in Latin America in general there were reliable data to support research" (Bandieri, 2022, p.160), factors that in themselves diminished the consistency of the proposals; in other words, there is a deficient way of dealing with the problems in the rural sector in Latin America, which results in deficient public policies.

In that perspective, we propose to investigate viable alternatives in the development of the rural sector of Arequipa, specifically the aguaymanto, as a product with native characteristics of the Peruvian Andes, but that for special situations its cultivation was displaced and today we intend to promote a viable value chain. The recognition of physalis peruviana fruit known as *capulí, aguaymanto, uchuva* and even *Golden Berry*, is a native fruit with nutritional characteristics "such as vitamin C; minerals such as copper and iron in high proportion, and antioxidant compounds such as total polyphenols that could contribute to the health of the people who consume them" (La Rosa & Lozano Zanelly, 2021, p. 15); their contents show a high protein content, as demonstrated in the publications, however, the lack of knowledge on the part of farmers, ends up marginalizing them from their potentialities.

Beyond the origin of the product, its nutritional characteristics have long been demonstrated, "Peruvian native fruits: aguaymanto, pitahaya and quito quito have a high content of nutritional compounds, bioactives and antioxidant capacity, which can satisfy a large part of the daily nutritional requirements, necessary for vulnerable populations" (Obregón et al., 2021, p.438), which prompts to propose it as a productive and export alternative, considering that until today in our region it is considered a wild product without major properties.

From the territorial approach, in recent years theory has been built in the different analyses of the rural sector, the territory under the consistency proposed by Spíndola (2016) are "a consequence of the historical becoming and lives the same transformations as the population" (p. 36), that is, it is a symbiotic analysis, between nature and man, in the journal *Ager* they mention the "nature-society link,... interpreted as a social construction that has its own identity" (Auer et al..., 2022, p.12), both authors refer to the territory not as an abstract and static concept, on the contrary, it is a dynamic construction that generates identity; as the aguaymanto is an original product of these lands, which over time have not generated identity, while nature maintains this maternal bond, socially it could be considered as an innovative proposal. At the same time, territory is considered as a new cultural approach, therefore, it is proposed as an element of geographic analysis (Cejudo Mejías & Oliva Marañón, 2023), in accordance with the analysis of territoriality.

The analysis proposal proposed from the perspective of articulation as a binding element in the process of innovation in agriculture, has to do with the relevant problems of communication in the rural sector, especially when some conditioning factors are perceived in its application, "it is necessary to identify the conditioning factors of participation and communication mechanisms between organizations" (Mera et al., 2021, p.408). No innovative proposal is possible if it does not recognize the articulating elements; neither are analytical simplisms possible, "In very depressed rural sectors there is often the problem of seeing ICTs as the salvation of their current situation or as the culprit of their future ills" (Bossio et al., 2005, p.51). It is therefore necessary to conduct a more thorough review that is in line with the social context of the sector under analysis.

Research shows that in rural sectors the limitations in cognitive terms are evident, "the population of the rural area that undertakes an activity with little basis of academic training is limited in their skills and abilities for the management and implementation of technology and media" (Cardenas Zea et al., 2016, p. 8), in turn, accessibility due to socioeconomic constraints, has a direct impact on this process of articulation or linkage with intermediate cities, imprisoning in a reckless manner the development of sectors that could become emerging. The communication problems in the rural sector result in two aspects, on the one hand, accessibility, and on the other, digital literacy, Bordalba et al, (2018) underline

that these are problems that underlie intensifying the isolation of rural peripheral areas, where most of its inhabitants are sexagenarians.

Another aspect that characterizes the rural sector is the increasing displacements, the migration from the countryside to the city as a result of the industrialization process, has had a negative impact on the strengthening of potential human food pantries, the depopulation of rural sectors has generated an evident migration for some years as pointed out by Gómez-Pellón (2022) in the magazine Ager, where he emphasizes that female confinement, where the theory states that it occurs because women prioritize family, care and domestic activities to economic and social chores. Migration is manifested by different social factors, state indifference to the problems of health, education, culture, technology, accessibility, etc., motivates parents to send their children to progress, marginalizing their geographic spaces to processes of innovation and improvement in the quality of life of its inhabitants.

2. Methodology

The field work was carried out in five rural districts of the Arequipa region, considering that the term rural refers to what is not urban, however simple it may be, theoretically rural is not significant, Chigbu points out "ruralization is a tendency at the opposite end of the continuum", that is, the academic path is not along the rural path, on the contrary we easily find theories of urban planning, urbanism faculties, however, ruralism is the atypical, the unusual, to that extent; The research undertakes a constructivist approach, it is sustained on the basis of the applied action of the rural inhabitant, in the same field is where the theory of ruralism is built.

The article is part of the research of the institutional value chain of physalis peruviana aguaymanto in Arequipa, the instruments applied are surveys and interviews as a corollary of five forums held according to the scheduled dates, with the participation of professionals in agronomy, economics and communication; In order to establish links for the cultivation of the fruit, we coordinated with the authorities of each district, Pocsi, Santa Isabel de Siguas, La Joya, Majes and Chiguata; all rural districts on the outskirts of the city of Arequipa. Each institution in coordination with the research team disseminated the event and the participants in the forum were farmers who voluntarily attended and shared experiences through the instruments applied.

Come relevant characteristics of the participants, more than 80% are over 60 years old, all are engaged in agriculture, the stimulus generated by the research team is the delivery of seedlings, the schedules of the forums are in the afternoon, starting at 15:00 hours, considering the work in the field. No sampling strategies were applied to exclude the participants for any reason, as shown in Table 1, the majority of the participants were women, however, no strategy was applied to modify the spontaneous attitude of the participants.

Table 1. *Characterization of participating farmers*

Distritos encuestados	Género		Fecha de aplicación de instrumentos	Descripción resumida del distrito
	hombres	mujeres		
Pocsi	11	22	16/12/2022	Distrito tradicional rural que está a 3047 msnm cultivo de papas, habas, maíz
Chiguata	7	10	13/05/2023	A 30 km de la ciudad, 2940 msnm, cultivo de maíz, papas, ocas, habas, etc.
La Joya	12	13	13/04/2023	Se ubica a 1274 msnm, cultiva frutas, exporta cochinilla y otros
Santa Isabel de Siguas	8	15	30/03/2023	Está a 1360 msnm, cultiva frutas, higo, membrillo, tumbo, etc.
Majes (pedregal)	10	17	11/05/2023	Distrito de la provincia de Caylloma, está a 1460 msnm, centro agrícola y ganadero
Total	48	77	125	

Regarding the research format, surveys and 10 semi-structured interviews were applied after the forum called *latent advantages of aguaymanto in Arequipa*, considering that the production statistics of the product in the region are quite limited and in some of the districts are almost nil; being an emerging

product in neighboring countries such as Colombia and Chile and having as a premise that it is a crop of Peruvian origin, it is necessary our incursion in exploratory terms.

The theoretical diagnosis of innovative proposals in the rural sector are quite limited, at the beginning we referred to the rural perception against the current of progress in academic terms, as Chigbu, points out that development professionals have chosen to ignore ruralism; however, the bet on the potential it holds is still premature to point out, even more so if we consider the singular advance of genetic technology and polluting aggravations, it is necessary to reflect on the rational priorities of the academy, in the perspective of integral development of its different concomitant agents.

The concern for connecting rural sectors in Peru goes back a long way. In 1988, the magazine *Chasqui* reported that in August 1979 a rural communication services project was created in Peru in agreement with the United States Agency for International Development (AID), in which they proposed the connection of networks to interconnect the health, agriculture and education sectors, although the results were like a siren song, as detailed by Mayo (1988), the team's concern is plausible; Although the theoretical accumulation in this regard has been limited, the precarious beginning does not affect the perspective of the new rurality in Latin America, so called by some theoreticians; our proposal affects interdisciplinary work with a constructivist approach, starting from the farmer as the builder of his own innovations, Piaget leaves well supported these rational concepts, today taken up again in this so-called new rurality.

However, this premise would have great weaknesses if they are not conceived as integral proposals, as described by Bossio, "In very depressed rural sectors there is usually the problem of seeing ICTs as the salvation of their current situation or as the culprit of their future ills" (Bossio et al., 2005, p. 51). This statement should be considered in all institutions where investment and support decisions are made for rural sectors; there are many negative experiences in this regard.

In this analysis, it is unavoidable to recognize that rural sectors suffer from high levels of inequality and the differentiable gaps are highly distorting for development, the perspective of the new rurality recognizes elements that contribute to the significant reduction of poverty, considering a new concept of *rural area*, extending not only to the population criterion, but also to secondary and tertiary activities (Cabas Monje et al., 2015). Consideration that can clearly result in better responses to acute areas of poverty; a proposal that should be channeled from a transdisciplinary perspective, Daza stated that "It is urgent to promote interdisciplinarity between communication and other knowledge involved in communication for development, so that there is a relationship of articulation and not simply multidisciplinary parallelism" (Daza-Hernández, 2008, p.93).

Another aspect to take into account in this analysis lies in strengthening the radius of trust in the rural sector, which is a singular and priority instrument, "normative networks of trust are important because the learning process of farmers is mainly social and requires mutual communication and communication with other actors, which is favored by an assertive interpersonal communication that allows the flow of information" (Ramirez et al., 2020, p.263). It should be emphasized that accelerated technological transformations are slow in rural sectors, which can lead to disillusionment.

The aguaymanto is a native product of the Peruvian Andes, in each of the countries that cross the inter-Andean valleys have a different name, keeping its scientific name Physalis peruviana, ancestrally in Peru it was called *aguaymanto* or *capulí,* In Colombia it is called *uchuva*, in Chile *Golden Berry*, the varieties are not very well defined. "The cultivation of the uchuva is a line of the agricultural economy, which presents very good prospects, due to the great interest in national and international markets" (Velásquez et al., 2007, p. 3786). It is perceived as an innovative product, however, it is recognized that it is an ancestral crop that over time did not generate identity.

Recent applied research shows that *aguaymanto,* also called *uchuva,* could be a nutritional supplement for children, "The "gummies" of guinea pig and uchuva as a nutritional supplement in the reduction had a very favorable effect in reducing anemia in children" (Palma et al., 2019, p. 4); demonstrated foundation in child growth processes and becomes a viable alternative to its cultivation. A worrying aspect is pointed out by Yaschine, demonstrating that the current economic model in Mexico, which is very similar to the Peruvian one, contributes to reproduce inequalities, even more so in rural sectors, where access to quality education is deficient in addition to low levels of achievement (Yaschine, 2015).

We assume the innovative proposal from Medina's analysis where he recognizes three transcendent dimensions in the innovative process, first the recognition of transcendent innovation as an element of communal development, the second element is the economic commitment from the ethical and moral order, whose sustainability responds to territorial constraints; as a third element the reciprocal action of the different actors in the value chain (Medina-Cuéllar & Portillo-Vázquez, 2014).

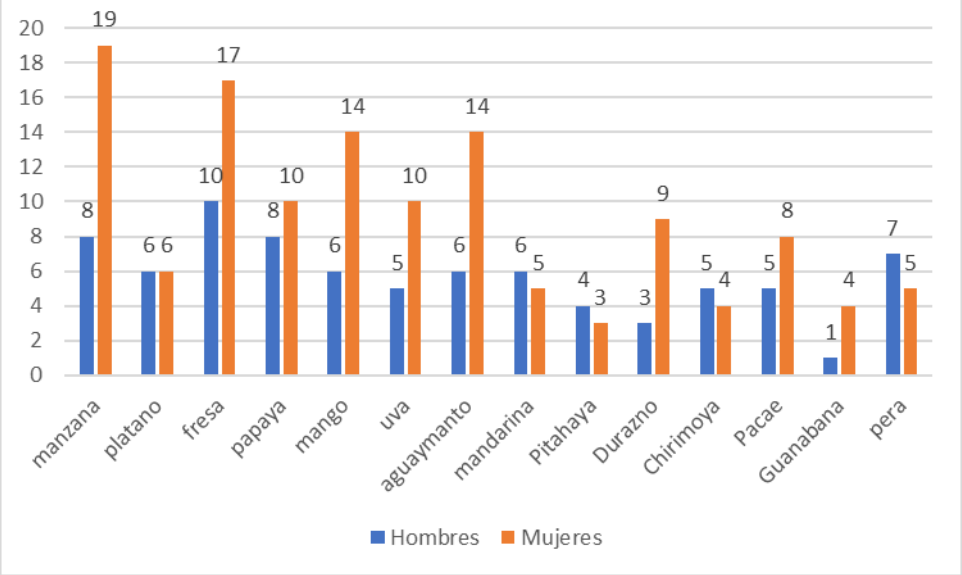
The processes of productive innovation in rural sectors have a number of factors that weaken their proposal, economic constraints and technological access are blatant evidence, a recent publication shows that rural sectors have two common characteristics, that there is no state investment and that the villagers are not in the capacity to generate resources (Herrero-Olarte, 2018), that makes them more vulnerable, to the suffocating global process, it is necessary to rethink innovation strategies, both from the state perspective and the farmers' own concern.

4. Results

The districts studied have a rural character, their crops are diverse, however, they are circumscribed by the characteristics of the climate, the valleys that are below 1,500 meters above sea level. They are more prone to growing fruit, in this case Santa Isabel de Siguas, Majes and La Joya; among the crops reported in the applied instruments are fruits such as quince, peach, papaya, among others. The breadth of their crops is open. On the other hand, in the districts studied, such as Pocsi and Chiguata, the crops are high altitude, potatoes, corn, ocas, beans, among others. It is necessary to underline that in Chiguata aguaymanto is cultivated and usually in the parks aguaymanto chicha is commercialized, at the same time, in technical terms there are no such restrictions for cultivation; that is to say, there are stereotyped restrictions, they are mental structures that generate restriction in their crops, to the margin that in diverse unplanned places aguaymantos grow without any restriction and they are seen as wild fruits, the farmers consider them as weeds and many times they pull them up because they are mixed with their crops.

The levels of preference of the different fruits that are usually consumed in the region, according to the farmers, considering that the application of the instrument was carried out after highlighting the potential of physalis peruviana, both from the cultural point of view due to its origin and its nutritional and protein characteristics, could have sensitized the responses, however, the inclination for its consumption is still resistant, as shown in Figure 1.

Figure 1. Fruit preference by gender of farmers in Arequipa.



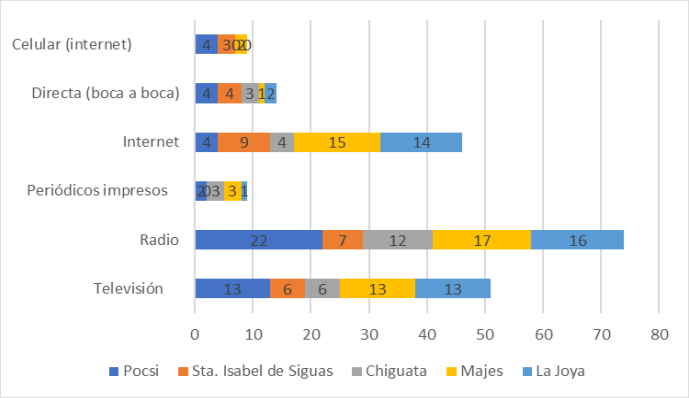
Note: Results of the field work carried out in the 5 districts.

The absolute data show a preference for apples in the female gender, followed by strawberries, mangoes and aguaymanto, and it is evident that the awareness-raising talks may have had an influence, although the male gender does not have the same relevance. In this space it is necessary to reflect on

the origin of the product and the reasons why it has not been able to position itself as a product with identity because the territorial approach would be transcendent; It is perceived that the capulí was an ancestral fruit that was never cultivated, the testimonies indicate that "it grew like a weed" and this generated that it was not seen with productive or marketing characteristics, as shown by its preferences, even knowing its properties, so it is necessary to promote the crop with an economic perspective, illustrating its boom in global markets, and even local, where the business perspective is in force.

In this scenario it is necessary to review the communicative forms of integration of farmers regarding their knowledge of products, social articulation starts from linking products with their characteristics and nutritional and protein properties, "the need for virtual communication as an articulating element of identities, as I said we reached a point where digital technologies are no longer simple tools, but take on an increasingly participatory character in a culture" (Cusihuamán-Sisa et al., 2020, p. 27); it is necessary to identify the communicative forms of farmers.

Figure 2. Farmers' media by district



Note: Results of the field work carried out

The results are shown in absolute data considering that they do not necessarily represent all the farmers in their respective districts, those who participated did so voluntarily, without any restriction; the media that stand out most are conventional, firstly radio and secondly television, followed closely by internet. Direct communication is also perceived as a form that is effective. Some details that we can point out from the interviews, that most of the participants are over 60 years old, show limitations in the use of technology. It is notorious that printed media are more restricted than word of mouth communication, the reasons are varied, from economic limitations, the low levels of credibility they have shown in recent years, especially in electoral processes, generating high levels of distrust.

A recurrent aspect in rural sectors is conventional information that differs tangentially from the information needs of each population center, making it necessary to distinguish targeted strategies (Cusihuamán-Sisa et al., 2021). We point out the above statement considering that the research was carried out in nearby provinces, where the socioeconomic characteristics are similar and the shortcomings in its application as well as its potentialities do not differ. Therefore, the statement is valid.

In the insistent analysis of the use of information technologies in rural communication, when asked if they recognize the networks and which one they usually participate in, only Facebook has significant participation, followed by YouTube; however, it should be clarified that in global terms participation is limited. The interviews indicate that due to lack of time and lack of access, they do not access the networks. It is evident that in sexagenarian people the limitations of virtual management is a restriction that even has to do with digital literacy, considering that the work in agriculture is hard, the possibilities of training are scarce. That is why digital literacy proposals are not sufficient for the innovative process in new crops, in countries such as ours, state intervention is necessary in rural agricultural innovation processes, "The dimensions and characteristics of public action are different, as well as its effectiveness, but its contribution to the technical transformation of agriculture is evident" (Fernández Prieto, 1999, p. 95), even in developed European countries public participation through their governments is called academia.

The dialogue with farmers regarding their links with their peers, the ways of interconnecting, starts mainly by identifying intercultural activities, called collective festivals where common meetings are

gathered, communication is direct and in these cases if they perceive the interconnection through networks, however for these concentrations are present the children and grandchildren who generate these connections and the fluidity of the messages congregates networks; for this reason, although they do not manage and are not necessarily digitally literate, but they do participate in such networks. Among the meetings where the largest number of inhabitants are concentrated are the anniversaries and patron saint festivals; anniversary of the district, where contemporary customs are parades, activities such as carnivals; the patron saint festivals are still the most identity, both because they generate massive participation, so they connect people from different regions and even from abroad, making it possible to energize the networks.

Practically all farmers own a cell phone, it becomes a basic communication tool in rural areas of Arequipa, other equipment such as computers are mentioned, but on a very limited scale, the significance is minimal, which would result in unsuccessful training, which is why we believe that digital literacy proposals in rural areas would be of little use; our proposal encompasses comprehensive approaches:

> The relationships between Universities, innovation centers, governments, public policies and producers must be coherent and in line with a guiding policy of development and technologies that allow the progress of the production of small and medium producers that ensure food sovereignty, as well as the progress of large industries to export on a sustainable and inclusive basis, valuing agroecological and innovation alternatives that require few resources for their implementation, as well as support for family farming. (Chávez et al., 2015, p. 490-491)

In this analysis, it is important to generate spaces of articulation, where the participation of farmers has a real dynamism, both through the media and in the action itself; taking into account their proposals in the application of the field itself is unavoidable, especially if it is about innovation processes, or rather about rediscovering crops that were originally native to these places. The proposal sustained in the scientific journal Finisterra where the local is combined with the global, we add the traditional to the global, it is not possible to develop innovative crops without an economic vision, even more so if it is about products that are potentially within the reach of local farmers, without bypassing the intermediate urban sector, (Baylina et al., 2019). It is not possible to motivate the cultivation of products without a marketing scope, so it is important to generate links that strengthen territorial identity with economic support.

5. Conclusions

The five rural districts of Arequipa, Pocsi, La Joya, Chiguata, Santa Isabel de Siguas, Majes and La Joya, are identified as vulnerable sectors of the Region, have large agricultural areas and a latent potential for development; physalis peruviana, the aguaymanto being an ancestral product that due to territorial dynamics has been losing identity, it is necessary to boost its cultivation, within an integrated development scheme, considering interdisciplinary and transdisciplinary proposals, recognizing the properties and characteristics of the aguaymanto. The integration links at the proposal level make it necessary to recompose the networks according to the capacities of the farmers. In terms of articulation, it is necessary the participation of organizations and institutions with territorial roots, the state through economic agents, academic institutions, both universities and institutes of higher education, non-governmental organizations and farmers' associations have the duty to strengthen production chains with the prospect of engaging in local, regional and international markets, especially recognizing that the aguaymanto has potential that easily surpasses other similar products; The territorial proposal is presented as an innovative alternative in the sector, regardless of the fact that nature has already identified it, culturally in our region it has not generated identity, and it is necessary to rethink it in all institutional areas.

References

Auer, A. D., Mikkelsen, C., & Maceira, N. (2022). Territoriality, ecosystem services and sustainable practices of producers in Southeastern Buenos Aires, Argentina. *Ager*, *35*, 7-37. https://doi.org/10.4422/ager.2022.09.

Bandieri, S. (2022). From rural history to inequality and poverty in the footsteps of Jorge Gelman. *Boletin Del Instituto de Historia Argentina y Americana "Dr. Emilio Ravignani," 2022*(Special Issue), 157-164. https://doi.org/10.34096/bol.rav.nEspecial.11547

Baylina, M., Villarino, M., Ramon, M. D. G., Mosteiro, M. J., Porto, A. M., & Salamaña, I. (2019). Gender and innovation in the new processes of re-ruralization in Spain. *Finisterra*, *54*(110), 75-91. https://doi.org/10.18055/finis16053.

Bordalba, M. M., & Bochaca, J. G. (2018). Accessibility and digital literacy: barriers to ICT integration in family/school communication. *Revista de Investigacion Educativa*, *36*(1), 239-257. https://doi.org/10.6018/rie.36.1.290111

Bossio, J. F., Saravia, M., & Wolf, P. (2005). *Desarrollo Rural y Tecnologías de Información y Comunicación* (AEDES (ed.); first). https://core.ac.uk/download/pdf/48031786.pdf

Cabas Monje, J., Vallejos Cartes, R., & Garrido Henríquez, H. M. (2015). Reconfiguration of poverty in Chile: a comparative analysis between rural and urban spaces. *Cuadernos de Desarrollo Rural*, *12*(75), 24. https://doi.org/10.11144/javeriana.cdr12-75.rpca.

Cárdenas Zea, M., Peralta, M., Zamora, J., Villarroel, M., Panta, K. P., Reyes, J., & Antúnez, G. (2016). Impact of Information and Communication Technologies on agricultural entrepreneurship. *Revista Electronica de Veterinaria*, *17*(12). https://www.redalyc.org/pdf/636/63649052004.pdf.

Cejudo Mejías, V., & Oliva Marañón, C. (2023). Degree in geography and land use planning. *TECHNO REVIEW. International Technology, Science and Society Review /Revista Internacional de Tecnología, Ciencia y Sociedad*, *13*(2), 1-11. https://doi.org/10.37467/revtechno.v13.4787.

Chávez, R. X., Lombeida, E. D., Pazmiño, Á. M., & Vasconez, F. del C. (2015). Innovation in the agricultural sector: Experiences in Latin America. *Ciencia e Investigacion Agraria*, *42*(3), 483-492. https://doi.org/10.4067/S0718-16202015000300016

Chigbu E. (2015). Ruralization: a tool for rural transformation. Development in Practice, 25: 7, 1067 to 1073, http://dx.doi.org/10.1080/09614524.2015.1071783

Cusihuamán-Sisa, G., Alarcón-Condori, J., & Ontiveros-Aparicio, W. (2020). Information and communication technologies, interculturality and rural development in the province of la unión, Arequipa Peru. *Publicaciones de La Facultad de Educacion y Humanidades Del Campus de Melilla*, *50*(2), 15-29. https://doi.org/10.30827/publicaciones.v50i2.13940

Cusihuamán-Sisa, G., Challco-Cutire, H., & Sucasara-Escarcena, L. (2021). Rural communication strategies in the covid-19 pandemic in the Municipality of Langui, Cusco-Peru. *Revista de Ciencias Sociales*, *27*(SPECIAL 3), 100-110. https://doi.org/10.31876/rcs.v27i.36495

Daza-Hernández, G. (2008). Comunicación. *Mediaciones*, 85-94. https://revistas.uniminuto.edu/index.php/med/article/view/290/289

Fernández Prieto, L. (1999). State, rural society and technological innovation in agriculture. Changes around 1900. *Studia Historica. Ha. Contemporánea*, *17*, 67-103. https://revistas.usal.es/uno/index.php/0213-2087/article/view/5878/5905

Gómez-Pellón, E. (2022). Strategies against Depopulation: The Case of Commuting in an Extreme Rural Area of Northern Spain. *Ager*, *34*, 47-75. https://doi.org/10.4422/ager.2022.05

Herrero-Olarte, S. (2018). What do marginal communities that generate structural poverty look like? *Papeles de Población*, *24*(98), 157-183. https://doi.org/10.22185/24487147.2018.98.39

Mayo, J. (1988). Comunicación rural en Perú. *Chasqui. Revista Latinoamericana de Comunicación*, *28*, 79-83. https://revistachasqui.org/index.php/chasqui/article/view/1926/1946

Medina-Cuéllar, S. E., & Portillo-Vázquez, M. (2014). Family farming and rural poverty, towards a paradigm shift. *Economia Agraria y Recursos Naturales*, *14*(1), 159-162. https://doi.org/10.7201/earn.2014.01.11

Mera, M., Lainez, A., Mera, L., & Ibáñez, G. (2021). Communes, communication and public policies: Water governance in Ecuadorian coastal rurality. *RISTI - Revista Iberica de Sistemas e Tecnologias de Informacao*, *1*(E40), 397-409. http://www.risti.xyz/issues/ristie40.pdf.

Obregón-La Rosa, A., & Lozano Zanelly, G. A. (2021). Nutritional and bioactive compounds of three fruits from the highlands and jungle of Peru as a potential source of nutrients for human nutrition. *Ciencia Tecnologia Agropecuaria*, *22*(2). https://doi.org/10.21930/RCTA.VOL22_NUM2_ART:1835

Obregón, A. J., Talledo, G. A., & Pinedo, R. E. (2021). Peruvian native fruits as a potential source of nutrients, bioactive compounds and antioxidant capacity in the nutritional requirement of vulnerable groups. *Revista de La Facultad de Agronomia*, *38*, 421-440.

Palma, D., Yllanes, L., Morales, J., Solano, G., Tarazona, D., & Levano, K. S. (2019). Effect of guinea pig blood and Physalis peruviana gummies in the reduction of anemia in children of Huanuco Peru. *SHIRCON 2019 - 2019 IEEE Sciences and Humanities International Research Conference*, *April 2022*, 10-14. https://doi.org/10.1109/SHIRCON48091.2019.9024853.

Ramírez, C. J., Robledo, J., & Aguilar, J. (2020). Trust networks and innovation dynamics of smallholder farmers in Colombia: An approach from the territorial agricultural innovation system. *Revista de La Facultad de Ciencias Agrarias*, *52*(2), 253-266.

Rubilar Donoso, G., Zorondo-Rodríguez, F., Navarro, C. L., & Carrasco-Oliv, G. (2022). Socio-environmental conflicts in southern Chile. Actors, power mechanisms and incidence to decrease rural poverty. *Ager*, *35*, 65-98. https://doi.org/10.4422/ager.2022.10

Spíndola, O. (2016). Space, territory and territoriality: a theoretical approach to the border. *Revista Mexicana de Ciencias Politicas y Sociales*, *61*(228), 27-55. https://www.scopus.com/inward/record.uri?eid=2-s2.0-84995705638&doi=10.1016%2FS0185-1918%2816%2930039-3&partnerID=40&md5=3f16f41ce177a6a312ec7c4b5dfa6d0d

Velasquez, H. J. C., Y, ; Omar Hideki Buitrago Giraldo, & Arango, S. A. P. (2007). Preliminary study of mechanical resistance to fracture and firmness strength for cape gooseberry fruit (Physalis peruviana L.). *Rev. Fac. Nac. Agron. Medellín*, *60*(1), 300-309. https://doi.org/10.1007/978-94-007-5628-1_35

Yaschine, I. (2015). is education enough to get out of poverty? Analysis of the occupational stratification process of rural youth in Mexico. *Revista Mexicana de Ciencias Políticas y Sociales*, *LX*(223), 377-406. https://www.revistas.unam.mx/index.php/rmcpys/issue/view/3637