



Rural community's territorial system dynamics at the Anzu river valley in the Amazon territory to propose change scenario

Authors: Ruth Irene Arias-Gutiérrez (rarias@uea.edu.ec)^a, Roberto González-Sousa (rgsousa@geo.uh.cu)^b, Angelina Herrera-Sorzano (aherrera@geo.uh.cu)^b, Manuel Pérez-Quintana (mperez@uea.edu.ec)^a, Elisa de la Bien Aparecida López-Cosme (elopez@uea.edu.ec)^a.

^aProfessors-Researchers. Universidad Estatal Amazónica, Km. 2½, vía Puyo a Tena (Paso Lateral). Tel. (+593) 32-888-118 / 32-889-118. Postal Code: 160150. Puyo, Ecuador.

^bProfessors-Researchers. Facultad de Geografía. Universidad de La Havana, Calle L. No. 353 e/21 y 23, Vedado. Tel. (+537) 8304076. Código postal: 10400. Cuba.

Graphical Abstract

Kichwa community's



Mestizos and *Kichwa*



Jungle and animal protection



Alliances and synergies



Abstract.

A *Kichwa* community's dynamics at the river Anzu valley, in the Ecuadorian Amazon territory, to propose change scenarios is analyzed. The Anzu valley, populated by sustainable mestizos and *Kichwa* communities, autonomous, in harmony with nature, visible in the different products that they process from environment resources, live in their legalized territories, where government entities recognized the *Kichwa* ancestral property. The *Kichwa* achieved to articulate strategies for the biodiversity resources use, whose beneficial repopulation and processing may allowed obtaining their maintenances, the payment of their labor and income families. The knowledge system and the people's cultural identity in social harmony with nature are revalued. The territory possession and its security, together with the ancestral knowledge, management systems understanding of the environment resources, which come from a cultural tradition, wisdom in the jungle associated with new technological forms that provide economic income through the local resources processing, gives communities the opportunity to renew their pride, which contributes to the consistent use of their environment. It recovers and intensifies the agro ecosystem management, gradually increases the promissory species sowing and repopulation, animals and plants. The desired scenario implies a sustainable, autonomous functioning, with alliances and synergies.

Keywords: *Kichwa* communities, Amazon territorial systems, sustainability.

Introduction

In the world, indigenous peoples have lived on the nature products, many peoples migrate when the area resources are depleted, until the natural environment is regenerated and can be used again. Indigenous peoples' livelihoods are altered by processes related to development, political decisions, natural resources exploitation, mining, urbanization, modernization, infrastructure development,

climate change and global warming (Dublin & Tanaka, 2014; Akerlof *et al.*, 2010). As a plurinational-intercultural rights & justice State, Ecuador is made up of 15 original nations or indigenous nationalities, as well as Afro-Ecuadorian populations, montuvias (peasants from the coastal region), white and mestizo people (Constitución de la República del Ecuador, 2008).

There is now an international trend towards the indigenous people's collective rights recognition, whose main claims are the land recovery from which they were dispossessed; the collective rights to own, develop, use, control and occupy their lands and traditional resources involve the integrity and conservation of their natural habitat, including environmental protection. Some Latin American countries have made significant progress in this regard, through constitutionally recognizing the indigenous people's legal personality, which has not been possible in other countries. The right to respect, integrity and conservation of habitats and natural resources are closely linked to the indigenous peoples and environmental protection (Gaona, 2013).

The Amazon western portion, including Ecuador, is one of the most bio diverse areas on the planet, home to several indigenous peoples, it maintains intact portions of jungle and it has a high probability of stabilizing climate conditions face to global warming problems (Smith & Leiserowitz, 2014; Gainette, 2009).

In the present evolution analysis researching from Amazon community's development and its consequences in the Ecuadorian Amazonian territory, it is contextualizing the original indigenous nation territory of Ecuadorian Amazonian *Kichwa* and the conceptualizing of the change scenarios pertinence. The aim was to analyze a *Kichwa* community's dynamics at the river Anzu valley, in the Ecuadorian Amazon territory.

Materials and Methods

Six communities located in the ancestral territory of the original Ecuadorian *Kichwa* Amazonian nation are studied, from Northeaster Tzawata, until the Southwester Veinticuatro de Mayo communities (table 1), located in the low, medium and high levels of the Anzu River valley, the communities settled since the end of the 19th century, come from the Napo province. They are rural communities, representative of a common origin and express a vulnerability gap in relation to the initiatives developed by the local governments and the planning units.

Table 1. Location of selected communities in the study.

Community	Z ^a	Altitude	North	East	Parish	Canton	Province
Tzawata	18	508	9 869 264	179 523	Carlos Julio Arosemena	Carlos Julio Arosemena	Napo
Wayuri	17	1200	9 862 500	831 306	Mera	Mera	Pastaza
Flor de Bosque	18	752	9 858 789	170 876	Santa Clara	Santa Clara	Pastaza
Boayaku	18	808	9 854 478	168 082	Teniente Hugo Ortiz	Pastaza	Pastaza
Unión de Llandia	18	1099	9 851 931	169 383	Teniente Hugo Ortiz	Pastaza	Pastaza
Veinticuatro de Mayo	17	994	9 845 509	832 473	Fátima	Pastaza	Pastaza

^a Universal Transverse Mercator South zone

The studied communities are located from 508 to 1 200 meter over sea level, in the eastern foothills of the central Andes, south of the sub-Andean zone identified as Napo Uprising; on hydromorphic alluvial soils with a forest vocation, volcanic origin and conservation purposes; soils formed by the dejection cones in the Amazon foothills, as a result of the fusion of plio-quadernary glaciers and volcanic and seismic activity (Senplades; Instituto Geográfico Militar, 2010). Rainfall is never less

than 4 000 mm per year and exceeds 6 000 mm per year; the average temperature is set between 20 & 24 ° C; the climate is tropical humid; the topography corresponds to broken and collapsed terrain, with slopes varying from relatively flat terrain in the lower areas to inclinations of 70 degrees or more at higher altitudes. Landscapes prevailing are permanent humid tropics (González and Salinas, 2010). The life area corresponds to pre-montane rainforest (Cañadas, 1983); plant formation is always Piedmont green forest (Sierra, 1999). The region contains just 5.06% of the national population, with densities from 2.82 to 15.38 inhabitants per km². The research goes through surveys to the families and their leaders, interviews to former settlers, and discussion in nine workshops.

Results and Discussion

The *Kichwa* communities have the *chakra* system installed in primary or secondary forest to take advantage of the organic fertility of the forest, it's cultivated for several years and is nourished with the system of *ushun* (crop regeneration); when it loses fertility, it becomes in *purun* containing the remaining planted species: fruit, medicinal, forest, like the *ayllu's* (family lineage) and the communities' work testimony, footprints in the territory for recognition of limits. This indigenous system in the vast Amazonian territory remains imbricated with the environmental system and provides subsistence sources and benefic species. According Escobar (2002) biodiversity conservation is only ensured with local cultures and communities focus. *Kichwa* culture is prevalent in the communities, with their systems of treatment of the environment, farms, cultural ceremonies of healing and evidences of the ancestral territories in petroglyphs.

The indigenous communities said that the jungle or *Pachamama* is their pharmacy, supermarket, school, security system and origin of power. Although they maintain large amounts of forests and compensation programs exist as "forest partners", they did not receive payments in cash or others for the environmental system maintenance, water protection, biodiversity conservation, Oil Company's compensation or mining companies, reforestation, agroforestry or any other. Only the Tzawata community received in 2012 a tourism group interested in learning about life in the community, from its own reality. It was investigated the benefit that the environmental system provided to families, by extracting products for domestic use and for the market, assigning a monetary quantification for each element used; for example for wood to cook, considered a free service of the forest, the family estimated an amount or cost in money on the assumption of how much can pay or how much can be sold the fuel wood unit. Table 2 indicates the products extracted from the forest in 2012 and their quantification in money; it is a quantification of the goods or products they use, although they do not mean cash income in all cases for all families.

Table 2. Products of the forest used in 2012.

Community	Forest products, medicinal, other uses, wild animals.	Annual familiar Income (\$)
Tzawata	Fine woods of chuncho, ahuano, cedar, laurel; fibers; barks and medicines, leaves, guayusa, cat's claw, guanta; edible fruits of hungurahua.	520
Wayuri	Wood to cook; chonta edible fruit; Chugchuhuazo medicine and Guayusa.	215
Flor de Bosque	Cinnamon and laurel fine woods; soft pihue wood; wood to cook; animals armadillo, guatusa, guanta; chambira and pita fibers; turmeric and ishinggo species; cat's claw medicine, drago blood.	533
Boayaku	Cinnamon, chuncho and laurel fine woods; soft pihue wood; sajino; chambira fiber; mushukhuan medicine.	960
Unión de Llandia	Canelo hardwood; soft pihue wood.	813
Veinticuatro de Mayo	Canelo hardwood; soft pihue wood; wood to cook; palmito; guatusas; monkey	160

Land, forest and water are more than a resource for peasants and indigenous people, it is relevant as a subject, part of its culture and identity; any local development project considered within the framework of a strategy must be oriented towards the biodiversity conservation, support the production of communities beginning with traditional systems research in their orientation both to the market and to the domestic economy. The territorial system under study has great biodiversity, not intensively occupied according to its morphology, becomes a priority area for establishing local development projects, but these can't ignore the intrinsic values associated with biodiversity, such as the principles of local autonomy, knowledge, identity and economy (Escobar, 2010).

Table 3 presents the synthesis of environmental system strategic diagnosis, with the structural and conjuncture keys that define the current territorial model. However, it is necessary to emphasize that structural keys generalization based on the environmental system strategic diagnosis does not mean that the impacts and responses are common to all communities, which is evidenced in the differences reported in the variables analyzed in the surveys. In the knowledge axis, economy and food sovereignty, the action lines include the systematization, recovery and socialization of values and the management and conservation forms of the territory and its resources; modeling the dynamics of the local, family, community and market economy (Coraggio, 2013, Figueroa, 2013); the definition of symbolic action forms, values and new economic practices in relations within the communities and in front of the market. In this axis the possibility of undertaking agro ecological, plant therapeutic, tourism (Tuncay, 2013), heritage recognition and social, cultural and demographic studies can be evaluated, in a strategic relationship with the Amazon State University.

Table 3. Environmental system strategic diagnosis

Structural keys	
Potentials	Weaknesses
<ul style="list-style-type: none"> - Key position in the <i>Kichwa</i> ancestral territory, near services axis. - Plant cover compatible with assigned conservation vocation. - Richness landscapes, biodiversity and associated knowledge of species uses, fine and soft woods, fibers, medicinal plants, foods, rituals, cosmetics, wild animals and natural fishing. - Roads network do not reach all communities that does not allow the colonizing possession ambition over the territory. 	<ul style="list-style-type: none"> - There is a lack of legality and there is uncertainty about the access scope, travel and use of the ancestral territory. - It is a weak existing resources use in landscapes and biodiversity. - Legal and illegal mining incursion. - Road network does not reach all communities, which makes it difficult to trade.
Short-term keys	
Threats	Opportunities
<ul style="list-style-type: none"> -Existing landscapes and resources degradation, due to contamination -Species extinction due to overuse, bad use, natural climate change and associated with contamination farms. 	<ul style="list-style-type: none"> - Sustainability and change axes declaration of productive matrix in the national plans of development for the good life in Ecuador. - Global alarm for the biodiversity conservation.

Conclusions

Products extracted in the communities from the forest in 2012 and their quantification in money do not mean cash income by these ones, but jungle does offers products to families for domestic or merchant use. Communities with more knowledge that conserve jungle, have *Kichwa* tradition and that are near ways have more income than those that have minor jungle resources and those that are far away from

the roads. The reduction of the resources of the forest and the reduction of the cultural tradition causes scenarios of change toward the greater commodification of products.

Structural keys generalization based on the environmental system strategic diagnosis reveals potentials use from the own jungle and local people knowledge, but it is possible replant richness resources that give incomes to families; however, the structural keys generalization not mean that the impacts and responses are common to all communities, which is evidenced in the differences reported in the variables analyzed in the surveys. Change scenarios needs too the strategic collaboration among communities, university and development actors.

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