

CrossRef DOI of original article:

1 Ecological Viability and Cybernetic of Ayllu

2 Alejandro Malpartida

3 Received: 1 January 1970 Accepted: 1 January 1970 Published: 1 January 1970

4

5 **Abstract**

6 We introduce the concept of Ecotomo to homologate it with the Ayllu (Aymara Quechua)
7 governance system, laying the foundations for its design as a cybernetic system. The aim is to
8 re-establish the Oikos that ecology and economics developed under a neoliberal vision (the
9 chrematisation of exchange value) have eliminated from the culture-nature relationship

10

11 **Index terms**— ecological viability, ecotomo, chrematistic, ayllu, culture-nature.

12 **I.**

13 Frame n organization is a type of community that defines its viability and determines the boundaries of the
14 network of relationships or relational field because it is a relational system that recognizes and reproduces the
15 relationships that make it viable, even without considering its origin or purpose. When we talk about borders,
16 we're talking about the relationships that organize that field from its processes of agency (taking it over) and
17 belonging (becoming a part of it), which constitute its territoriality. This implies that the community's complexity
18 as a network of human relations is determined by what the culture recognizes as constitutive of its territoriality.
19 At this point, it is necessary to distinguish two points of view on cultural identity and opposition. accumulation
20 of exchange values.

21 On the other hand, we use the term opposition whenever culture constructs territoriality as a class: whether
22 culture is different from/the same class as nature (but not a member). The current economy's position, which
23 is strictly chrematistic, leads us to prioritize natural assets not as use-values but as a source of exchange value
24 production. This is what makes the current ecologists a flagrant antinomy, as stated in the preceding paragraph,
25 by considering belonging but valuing oppositely. A "Davosian school of ecology," to use a euphemism. When we
26 talk about "Davosiana," we're talking about the World Economic Forum (WEF), a gathering of top international
27 business and political leaders to discuss the world's most pressing issues, including climate change.

28 Thus, natural resources are exploited in accordance with the needs of the culture of agency or property, which
29 have been determined a priori and generated politico-administratively. In the first chapter of his Politics, Aristotle
30 distinguishes oikonomia from Oikos, which he defines as "A necessary and natural community, the very basis
31 of existence, and, in the human case, "constituted for daily life," whose members eat the same bread and are
32 warmed by the same fire" (Pol. 1,2).

33 Thus, oikonomia is concerned with determining how to provide oneself with the use-values required for a good
34 life. In contrast, Aristotle defines chrematistics, or "the art of acquisition," in two ways: one as a complement to
35 oikonomia in the sense that it.

36 Concerning the arguments advanced, both ecologists' and current economists' concepts refer to chrematistic
37 thinking, which is not relational. As a result, they develop classification systems based on a realisticdualistic view
38 of the world in its most naive form. They ignore the reciprocity of the human-nature/culture-nature relationship,
39 as well as the development of the former in tandem with the latter. They, on the other hand, assign potentialities
40 to the "non-human system" based on the "benefits" it can bring to human culture. Instead of responding to the
41 "needs" freely manifested by the "sovereign consumer," these "benefits" respond to the needs of production and
42 the reproduction of exchange values, which actively shape and reproduce these needs through advertising and
43 merchandising ??Galbraith, 1983).

44 Both of the aforementioned perspectives have political implications because, by dissociating and breaking
45 the culture-nature relationship, they reduce the community's complexity to tradable objects, whether human or
46 natural. In other words, they turn the condition of the community's relational viability into a commodity, making
47 the human being the owner of nature. This is what we call colonization and epistemological extractivism, and

3 A) THE CONCEPT OF LIVING WELL, SUMAK KAWSAY

48 it runs counter to all bioethics. This paper is organized as follows: first, the uniqueness of culture-nature as a
49 relationship is discussed. The Living Well (Suma Qamaa in Aymara, Sumak Kawsay in Quechua) is then explained
50 as a relational culture-nature concept. Following all of these conceptualizations, the concept of Ecological Viability
51 is used to finally propose a relational cybernetic model (Kawsay) of the ecotome such as that of Ayllu, freeing
52 current Ecology from chrematistic concepts.

53 2 II. Bases of the Relational Conception

54 of the Culture-Nature Unit

55 Cartesianism and the disjunct image of the human world concerning the so-called natural or, rather, in the
56 objectivity of the subject. Objectivity allows the validation of arguments against the referent of experience, which
57 tautologically corroborates the objectivity of the subject, which is certainly, a predicate of the object.

58 In the Eurocentric conception of this world, the relation as philosophy did not take place, for most of
59 the scientific corpus, this is a given world of objects that demand the observer, who elucidates interactions,
60 transactions, and coercions among other forms of action.

61 The relation as philosophy is intricately connected to the conception of experience as temporality and history.
62 The principle of identity and the descriptions of the inherent character of objects held in science corresponds to
63 a primary conception in the history of knowledge, that is, the substance, essence, and autonomous character of
64 the real. (Malpartida and Lavanderos 2003).

65 The relational conception is immersed in the experience, in the situation and circumstance, there is no
66 possibility of a historical experience. From this perspective, cognitive decolonization implies recovering concepts
67 that allow such operation in semiotics, the Kawsay concept (Quechua) expresses it as relational and shared vital
68 activity (culture-nature), with a communitarian idea. ??Macas, 2010, p 25). Irreversibility arises then as a
69 condition of experience and not only as a reformulation of the classical concepts in thermodynamics such as the
70 non-linear thermodynamics of irreversible processes of I. Prigogine. From the relation, irreversibility is translated
71 as the logic of history and this is so because it is the logic of the living, the idea of probability arises then from
72 the irreversible and not the other way around, (Paci, 1954). For this reason, the notion of entropy does not find
73 irreversibility because it is defined in the statistical domain, it is the most probable state and as probability, it
74 is a predicate of the irreversible and not a condition.

75 In this scheme the irreversible to be such only requires novelty, process, emergence and is at the basis of the
76 conception of systems. If any communication must enter into the relational space of human nature, and as such
77 into the process of experiences and history, then reality emerges from that historical existential situation and
78 is comprehensible and orderly only within that situation. The Sumak Kawsay as a relational concept Culture-
79 Nature summarizes this fullness, communitarian, reciprocal, and solidary. ??Tenesaca Caguana, 2013, p. 18).

80 According to Paci (op. cit.), the vice of traditional (popular) metaphysics is to consider the object itself as
81 the substance of being and to isolate the world of "substance" from the world of "experience", thus reducing
82 experience to the necessary, the timeless and the unique. To leave aside the relation and the emergent character
83 of experience in all decision-making is to believe that scientific arguments are acontextual in their meaning, that
84 the aprocessual and ahistorical is what characterizes the subject of the relationship and that this is the basis for
85 its objective character and argumentative validation.

86 At this point it is worth asking what ideas we generate, from Eurocentrism, regarding the relationships
87 for a given context, are they immutable images of a dominant world immersed in mechanical and clockwork
88 determinism, or are they the possibilities that are cultivated from the historical understanding of cultural-natural
89 processes?

90 The answer to these questions is the basis of the process of epistemological decolonization assumes the
91 Judeo-Christian matrix that finds in the unity of the Greek "logos" the condemnation of polytheism and the
92 legitimization of a single, monotheistic thought. The counterpart of the literate citizen is the pagan barbarian,
93 a worshipper of other gods, that is, who lives outside the norms of civilization bases its explanations on the
94 strengthening of the properties of the object to granting exchange value to support the decisions of financial
95 capital.

96 3 a) The Concept of living well, Sumak Kawsay

97 Sumak The emergent of the words is Kawsay (Kichwa), or living well; Sumak, which refers to the good, the
98 beautiful, the harmonious, and the perfect; and Kawsay, which means life and existence ??Viteri, 2003). Sumak
99 denotes not only a qualifier of goodness, but also, more clearly, fullness. With a communitarian idea that
100 encompasses both spheres, Kawsay expresses the relational and shared vital activity, with other humans and
101 with nature. It would then be "life in plenitude" (Macas, 2010, p 25): a perpetual collective construction with an
102 ancestral foundation that is centered on community life. From the above definitions, and the systemic relational
103 perspective, its translation could be interpreted, since Kichwa is a language whose words do not have a fixed
104 meaning, but the interpretation that is made of it, as a relational culture-nature vision whose viability is based on
105 the process of agency and belonging as communion. We wanted to arrive at this definition given that, according
106 to the variety of meanings, Sumak Kawsay has been transformed into concepts, ambivalent, ethereal, and difficult
107 to concretize; convergent or divergent according to the ideological and political use made of them. (Breton et

108 al. 2014), consequently, Sumak Kawsay depends on the current of thought to which it belongs, which have been
109 identified as socialist and statist, indigenist and "Pachamama" or ecologist and postdevelopmentalist (Breton,
110 op cit.) This places Sumak Kawsay, according to how it is classified within these currents, in a different cultural
111 frame of reference, which leads to contradictions and operational gaps for decision making.

112 Thus configured, the relationship expresses a character opposed to capitalist chrematization and the cultural
113 assumptions it entails. Sumak Kawsay is based on another rationality, on a relational vision of the world in which
114 life in plenitude is based on the construction of an OIKOS of relations of reciprocity, solidarity, and cooperation.
115 The basis is the relational viability of the culture-nature community.

116 **4 b) Sumak allpa and Ecological Viability**

117 From the Kichwa philosophy, the Sacha Runa Yachai is postulated, which can be defined as what guides them
118 on their "long road to Sumak Allpa". This path is based on three principles: sumak allpa, sumak kawsay,
119 and sumak kawsay riksina. Sumak Allpa is the principle that regulates the culture-nature relationship (...). The
120 Sumak Kawsai orients the way of living of the community based on a relationality of reciprocity and collaboration
121 which is nourished by the culture-nature relationship. The Sacha Kawsai Riksina is the system of knowledge to
122 achieve a full life as a culture-nature relationship. It is the science of Sumak Kawsai, but "there is no Sumak
123 Kawsai without Sumak Allpa" (Viteri, 1992 in Cubillo-Guevara, A., Hidalgo Capitán, A. 2016).

124 Based on the above, the Sacha Runa Yachai is an alternative conception to the Eurocentric vision of sustainable
125 development since on the one hand, the concept of development does not exist in the Andean cosmovision (Viteri,
126 2000), and on the other hand, the Eurocentric, Judeo-Christian conception of sustainability is not relational.

127 It is also important to highlight the differences between production in the West and the Andean world (Sumak
128 Kawsay); it is possible to compare Andean technology with that of the West in three of its physiognomies: To
129 work is, in the West, "to make things, to produce"; in the Andean world it is "to raise life". The causal discourse
130 is the basis for the design and construction of technology in the West, while Andean technology is guided by the
131 culture-nature relationship and the process of life. That causal logic restricts the horizon of Western technology
132 to the material, while the principle of the process of life originates the second dimension in Andean technology:
133 the 'symbolic technology', visible in the rituals of production. This distinctive feature explains the particularity
134 of the Andean technological discourse, based on "the metaphor"; the personification of the relationship between
135 culture, nature, and work objects; the possible variety in the making and the symbolic language, to a relational
136 thought.

137 **5 c) The Concept of Relational Viability**

138 Based on the Relational Theory, elaborated some years ago by authors Malpartida and Lavanderos, it is considered
139 that a viable system is one that (...) solves its organizational conservation through a structural change strategy
140 (Malpartida and Lavanderos 2005, Malpartida, 1991, Malpartida and Lavanderos, 2000). Understanding as
141 "organization" the whole set of relationships that configure its identity as such, a process in constant creation
142 that implies the maintenance of its condition, its conservation, or its disintegration. We understand that, in
143 this line of thought, what can vary is only the structure of relationships, as long as this supports or allow the
144 organization to be carried out. Following the previous points, we will define the Viable Relational System (VRS)
145 as a configuration of networks of relationships that have achieved a coherent coupling between its ?relational
146 configuration relational ability? and its ?material energetic system sustainability?, in such a way that it does
147 not put at risk the relationships that generate and sustain the emergence of its organization. From these
148 definitions, we can homologate the Sacha Runa Yachai with the relational conception of systemic relational
149 viability, the relationship between the Sumak Allpa and the Sumak Kaway would determine the sustainability
150 or the patrimonial management of the material energetic resources to make viable the community network from
151 the knowledge system or Sacha Kawsai Riksina. (Fig. ??1). Ecological Viability, from Ecosystem to Ecotome
152 One of the structural limitations of sustainable development is the imposition of regulations based on concepts
153 that are currently confused or considered synonymous.

154 Environment and "entorno" must be distinguished as different (entorno is a Spanish word that means that
155 which surrounds and remains). It does not have an English translation; however, it can be understood as
156 what shapes the organism in its surroundings. The first is constituted by all the parameters that an observer
157 distinguishes without considering the organism. Entorno is everything specified by the organism and is expressed
158 by the behaviors emerging from the organism-entorno relationship; it is the current expression of this historical
159 process.

160 While the environment does not refer to the relational unit, the latter is included in the domain of the latter.
161 It has also been said that the entorno comprises historical processes. Thus, we do not speak of the evolution of
162 the individual, the population, or the species, but rather of the evolution of the organism-entorno.

163 Access to the entorno of any organism, as observers, is not necessarily experienceable. We cannot distinguish
164 the environment of a starfish or a T virus, we only know that these or other organisms discriminate something.
165 In other words, through the relationships generated and from our viewpoint as observers we postulate that they
166 respond to differences. To the extent that we can access the history of relationships, we can say that we are
167 getting to know the organism-entorno system according to the conservation of its organization.

168 The entorno must be treated from a monistic conception, that is, as the product of a relationship in our case.
169 In complex units, as is the case of the culture-nature relationship, the entorno is expressed through culture. It is
170 culture as an organization of relationships and transformations that operates on a given environment "modeling"
171 it into an entorno and recreating the relationships that finally define its identity as culture-entorno.

172 The generation of information, as part of the process of maintaining the organization of the organism-entorno
173 unit, is directly oriented to the preservation of identity: idem, of group and ipse, of ecoreferentiality (Morin,
174 1980). This set of relationships, as part of our ontogeny, is expressed through behavior as a relationship. That is,
175 decisions must be conservative of the sumak kaway-sumak allpa organization. On this basis, the organism that
176 destroys its entorno destroys itself (ipse). For the same reason, financial capital, lacking a relational conception,
177 proposes a development that avoids impacts on the community's entorno, that is, on its culture-nature relational
178 system.

179 In the same way that the duality or dissociation of the organism from its environment cannot be accepted, it
180 is inadmissible to try to explain the development of a society based on "relations that are internal to it" without
181 reference to an entorno that is not only generated by the culture of that society, but at the same time makes the
182 organization of that society possible.

183 The concept of the ecosystem as introduced by Tansley (1935) and later developed by Lindeman (1941), who
184 only conceived it from a domain of energy exchanges, has derived from its original meaning into different meanings
185 and partial meanings up to the present. For example, the confusion generated between the environmentalist and
186 the ecosystemic point of view (Vallentyne, 1993) or when talking about natural and human ecosystems as different
187 from each other. Moreover, for many ecologists, the idea of an ecosystem, instead of being an integrating concept,
188 has been transformed into an "external object". For example, when in a scientific paper one can read: "The model
189 proposed here derives how under these constraints competitive exclusion can give rise to diversity and neutrality.
190 Furthermore, our model suggests that neutrality may not just be an assumption for mathematical tractability
191 or a null model for understanding, but the general results of an adaptive process in a finite habitat with limited
192 resources, much like the earth." Keymer et al. 2008.

193 The environmental movement of the last three decades has done nothing more than spoil the relational sense of
194 ecology, transforming the environment into a thing susceptible to be put at a chrematized value, such as a tradable
195 good. The use of utilitarian terminology has even been accepted in this field, such as the idea of ecosystem service,
196 which, although it is said that it has nothing to do with the idea of the transaction for services, brings about
197 the conceptual distortion that we have been pointing out, regarding the basic natural functions to the idea of
198 service. So today we wake up to the fact that water is traded on Wall Street.

199 In this sense, we require a unity that makes it possible to dissolve the antinomies between social states and
200 natural states, given that the concept of an ecosystem has been insufficient to address this dichotomy.

201 6 Taken as a system, we have pointed out that the ECOTOMO 202 is the set of relationships capable of maintaining the organi- 203 zational emergence (relational viability)

204 of the complex Culture-nature unit, which at the same time can reorganize and reproduce itself (sustainability)
205 in such a way that it resolves its energetic and informational sustainability along the Spatiotemporal axis.
206 Malpartida and ??avanderos (1995, 2000).

207 7 C

208 According to the above, we will define as Ecological Viability the process or set of processes that allow the
209 organizational emergence of the Ecotome. We refer to Ecological by its root Oikos which, as we had mentioned
210 before, is at the base of the definition of Community according to Aristotle (op. cit) however, it improves
211 ostensibly with the Sumak Kawsay since the community is established as culture-nature relations. This forces
212 the Ecologist to rethink the sense of current research, which due to its reductionist character does not include
213 the culture-nature relationship.

214 8 a) The Ayllu ecotome and its relational cybernetics

215 Before designing the Ayllu ecotome, it is necessary to make explicit the concepts from which the design will be
216 generated. For this, we will introduce the concept of variety not required (Lavanderos et al. 2019).

217 A key concept in ecological viability has been variety, understood as the number of possible states of a system.
218 Ashby's Law of Required Variety, Ashby, (1956Ashby, (, 1958)), states that only variety can absorb variety.
219 However, the above statement is only valid when formulated in the field of interactions, but it is not possible
220 to sustain it when dealing with relationships, as in the case of human organizations. Thus, it is important to
221 establish the difference between interaction and relationship, which will be key in the design of the Ayllu.

222 Relational viability operates based on the matching strategy between the relational plane and the energetic-
223 material resource plane, Lavanderos and Massey, (2015). Along the same lines, the loss of resources in
224 an organization depends on the introduction of "unrequired variety", i.e., those relationships that generate
225 dissociation and loss of complexity, which bursts into decision making, generating a loss of organization. In this

226 way, we could define the non-required variety as follows: "For a relational system, all forms of non-required variety
227 generation are produced by destroying required variety." This is a fundamental difference with Asby, (Ashby, op.
228 cit).

229 variability. As we have discussed above, the Eurocentric developmentalist formula in comparison with the
230 proposals of living well generates a high degree of non-required variety that is almost impossible to control or
231 diminish.

232 If we think of it from the point of view of a controlled system, in cybernetics we must generate variety in such
233 a way that its design allows regulation and feedback that achieves the minimum required variety. This implies
234 understanding that the correspondence between the generated variety and the minimum required variety does
235 not have to be exact, necessary, or feasible, but rather; a variety with a minimum complexity is required for the
236 regulator of a system. The areas of diversity that interact and need to be regulated correspond to a matching
237 diversity in the system, the attenuation of the variety must be intelligently designed.

238 **9 b) The Construction of the Ecotome**

239 The ecotome, from our relational systemic vision, implies its conception as a network system of relationships,
240 which are structured based on processes around its cosmovision. The basic relational unit is built on the
241 relationship between a network and its reproductive process. All of which is expressed in the form of decision-
242 making. In this way, a network legitimizes the form of its work concerning a process, which allows access to 1)
243 the variety or number of distinguished steps or states; 2) to its variability or gap between observed and expected
244 results; 3) to the connective diversity or relational structures established to carry out the process. Continuing
245 with the above, the Ecotome can be modeled as a holored, which is coformed from the coupling between the
246 units of the sustainability and sustainability domains, in which the correction of the variety is not generated in
247 the autonomic dynamics, but a spontaneous process of selection of alternatives (epigenesis). The Ecotome has
248 the condition to replicate itself, within a recursive process of recalibration (stochastic), according to the strategic
249 objective of the organization, to build subsystems of networks, which contribute to the organization from its
250 operations and/or processes.

251 To achieve coherence between operation and administration, we need to fix the relationships between the
252 knowledge network (administration) and the processes (operation), which is achieved through the art or culture
253 of the network's work for these processes. This separates us from any conception of sustainable development and
254 allows us to homologate with the relationship between Sumak Kawsay and Sumak Allpa.

255 With these concepts, the Ecotome can be studied or constructed based on 3 elements that are not generally
256 thought of, these are the processes, the network that carries them out, and the culture or the "how they do it".
257 In a second moment, it is necessary to Year 2022

258 **10 C**

259 In the field of human organizations, unrequired variety assumes the form of a law, which can be exemplified as
260 follows: Situated within an organization, connective diversity, which is what allows the exchange of variety, is
261 weakened, or destroyed in its efficiency by introducing delays, impeding or generating resistance to the flow of
262 data necessary to the process of decision and production. We could add, from the point of view of the theory of
263 systems, that summative properties of the elements of the system would be introduced, which would spoil the
264 emergence of the constitutive properties of the organization and, therefore, of the decisionmaking process related
265 to its reproduction. This occurs every time a unit exchanges unrequired variety, which determines the loss of
266 control of its output consider how these 3 elements are related, which leads us to the definition of the Ecotome,
267 for this, we have used the following concepts:

268 1. Variety: Number of states or distinctions declared to carry out a process.

269 2. Variability: Observed gap between expected and observed.

270 3. Connective Diversity: Quality of communication with other ecotomic units that are not directly involved
271 in the process.

272 Accordingly, the process leading to the Ecotome modeling is conceptualized as follows (Fig As indicated
273 above, the model is generated from calibrations that, within the research process, go from the design to its
274 formalization. Formally we would obtain a model like the following (Fig. N°3): The ecotome proposes that to
275 reduce the variability of the processes involved in its management, the decision-making model of the knowledge
276 network must be made explicit, to expose the behavior of the variables that account for the output of its process.
277 This allows not only the control of these, but it also evidences the transparency of results for all the actors
278 involved in its reproduction.

279 The ecotome allows the integration of the whole command area from the co-control of variety and variability.
280 Likewise, the connective quality or diversity allows establishing the degree of collaboration with other areas, to
281 be able to control the variety of the processes that reproduce it.

282 **11 c) The Ayllu as Ecotome**

283 According to the definition of Ecological Viability and the organizational cybernetics of Ecotomo, concerning
284 defining a strategy of reproduction of the community organization as a coupling of sustainability (relationships)

285 with sustainability (energetic-material resources) to produce in both contours the variety not required minimum
286 the Ayllu would have the following basic characteristics: 1. A system of territorial organization in networks;
287 as a basis of systematization of the economy to produce use-value; which operates from a logic of configurative
288 culture-rituality and is hierarchically sustained by political authorities.

289 2. Spatiality as a fabric or territorial relational organization goes from a macro level, which is the control and
290 management of vegetational floorscontrol of highlands and lowlands -to a complex spiral system that conceives
291 the strategy of coupling between the Samak Kawsay and Samak Allpta.

292 The figure below represents the cybernetic model as follows (Fig. N°4):

293 .

294 12 In Summary

295 It is essential to recognize the bases of a syncretism to which we belong, and which is continually denied, without
296 which it is impossible to find viability, which implies at the same time not falling into nostalgic fetishism with
297 "timeless" pretensions, such as the inclination of "cultural studies" to institutionalize the periphery in a fetishistic
298 manner.

299 As a literal translation, Ayllu means family, but under the indigenous worldview, ayllu refers to a system
300 of relationships beyond the family, that is, the community. "The ayllu is the fundamental basis of indigenous
301 society, by which no positive activity will take place without the participation of the ayllukuna" ??Calapucha,
302 2012, p46). In this sense, ecological viability makes the reproduction of the Ayllu which is expressed as "collective
303 responsibility to ensure the welfare of the community and, therefore, family and individual welfare" (Kowii, 2009).
304 Ecological viability will be linked to their Sacha Runa Yachai, which determines and sustains the family economy.

305 The Ayllu, from a political and chrematistic point of view, is a regime of land appropriation based on the
306 simultaneity of common property and private possession, a generalized regime in the economic organization of
307 the Inca Empire (Choque 2011). The individual (jaqi) in the Ayllu cannot own land; the land does not belong
308 to him but to the Ayllu, which implies that he cannot accumulate exchange value by selling the land. Hence the
309 impossibility of dividing the territory of the Ayllu into private properties and alienating it. But the individual
310 can become a private possessor by belonging to the Ayllu, which leads to the production of use-value. It is from
311 this community configuration that the individual must position himself in the art of economy and it is in this
312 position where Non-Required Variety is produced, which, according to our relational vision, would be minimal
313 given that it does not produce accumulation of exchange value since it would attempt against the Sacha Runa
314 Yachai.

315 The Ayllu as Ecotomo is sustained as a condition in a heterarchical structure, which emerges as organized
316 from at least four processes: cohesion, coordination, communication, and conduction. The heterarchy proposed
317 here is one in which the members do not think of deciding one over the other, but of interacting. This form
318 of participation can generate multiple ideas, advice, and help, so that the whole group Year 2022 C functions
319 correctly, and has the greatest freedom of action. Heterarchies are networks, often hierarchical, interconnected,
320 and overlapping with individual components that belong and act simultaneously at multiple levels and with a
321 dynamic that allows the governance and emergence of this whole set of interactions, which is what makes up the
322 whole system.

323 The Ecosystem and its concepts detached from the culture-nature relational conception must obligatorily
324 migrate to a viable relational system, whose bases are relations of cooperation and reciprocity based on
325 heterarchical structures for finite material energetic resources. This is the basis of the ecotome that forces
326 to return to the economy to the production of the Unrequired Variety resulting from the chrematistic vision of
327 the world. In conclusion, the ecotome finds its niche in the Ayllu as a relational conception, this allows changes
328 and transformations from a cosmovision in which the territory of the community itself or Marka Uraqi, with the
329 living well or Sumak Kaway; the sacralized territory or Pacha Uraqi, with the concept Sumak Allpta, fundamental
330 concepts for a decolonized Science.

Sacha Runa Yachai

"Long road to Sumak Allpa" is the direction of relational viability culture-nature.

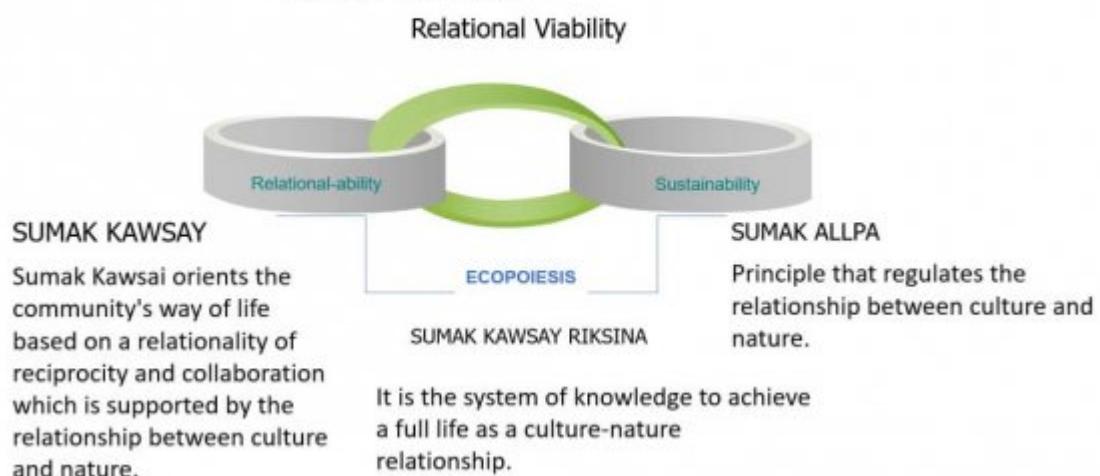


Figure 1: C

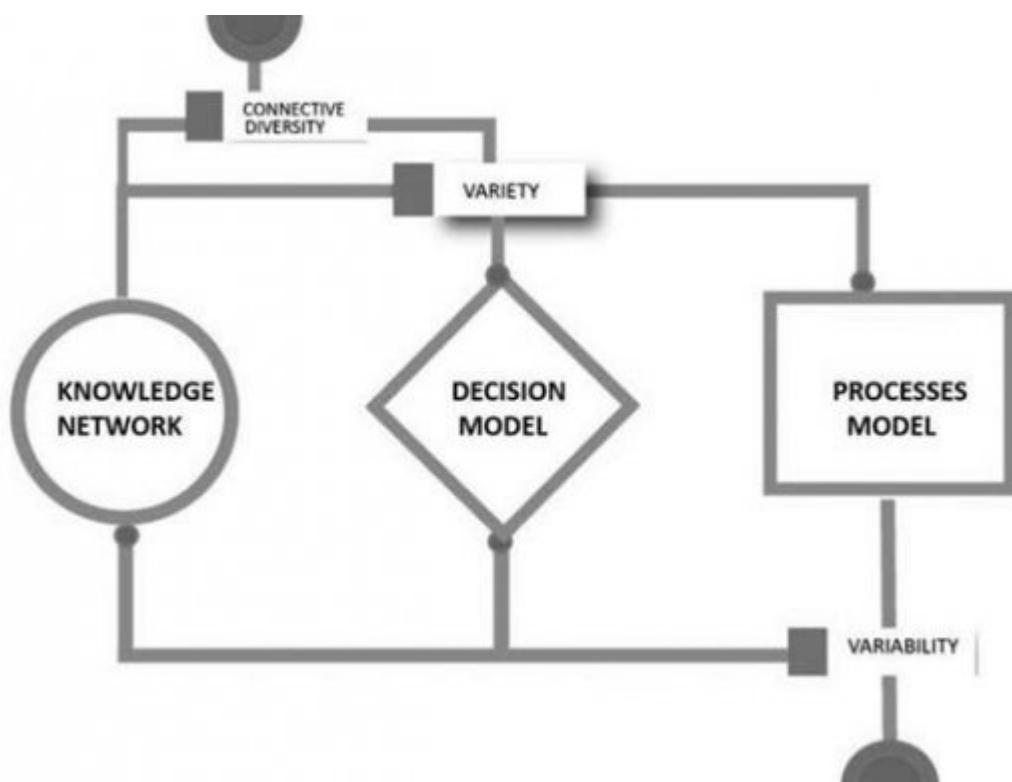


Figure 2:

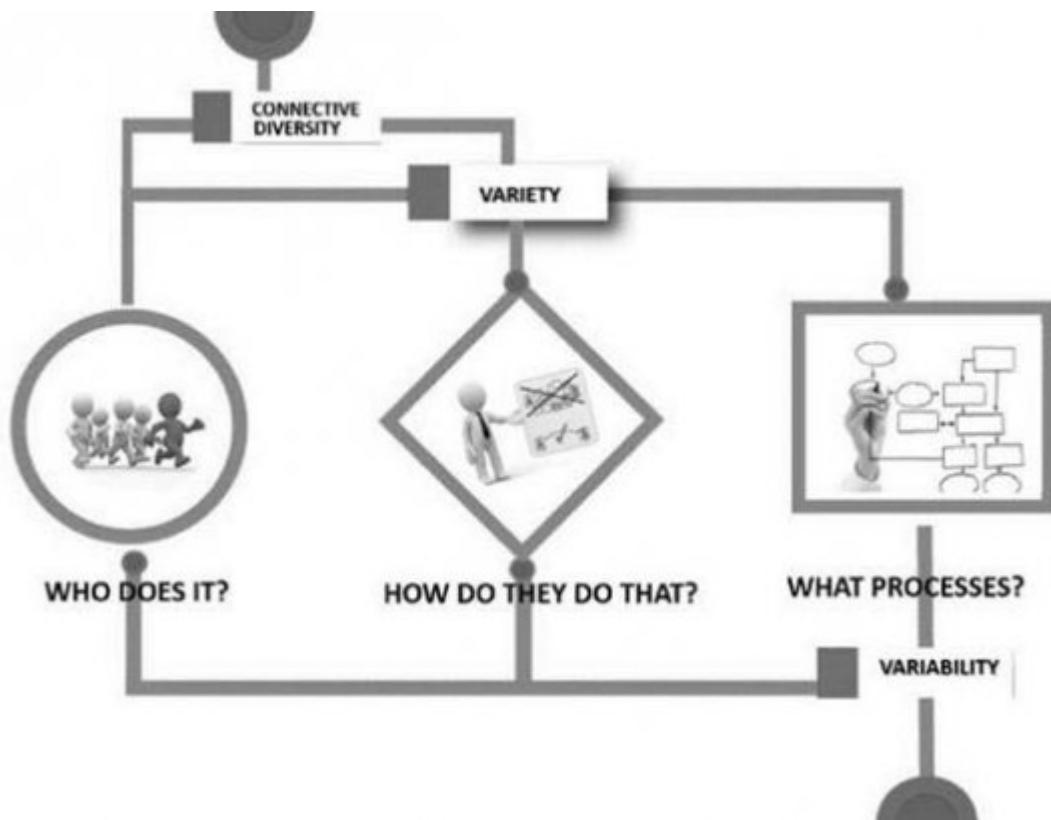


Figure 3:

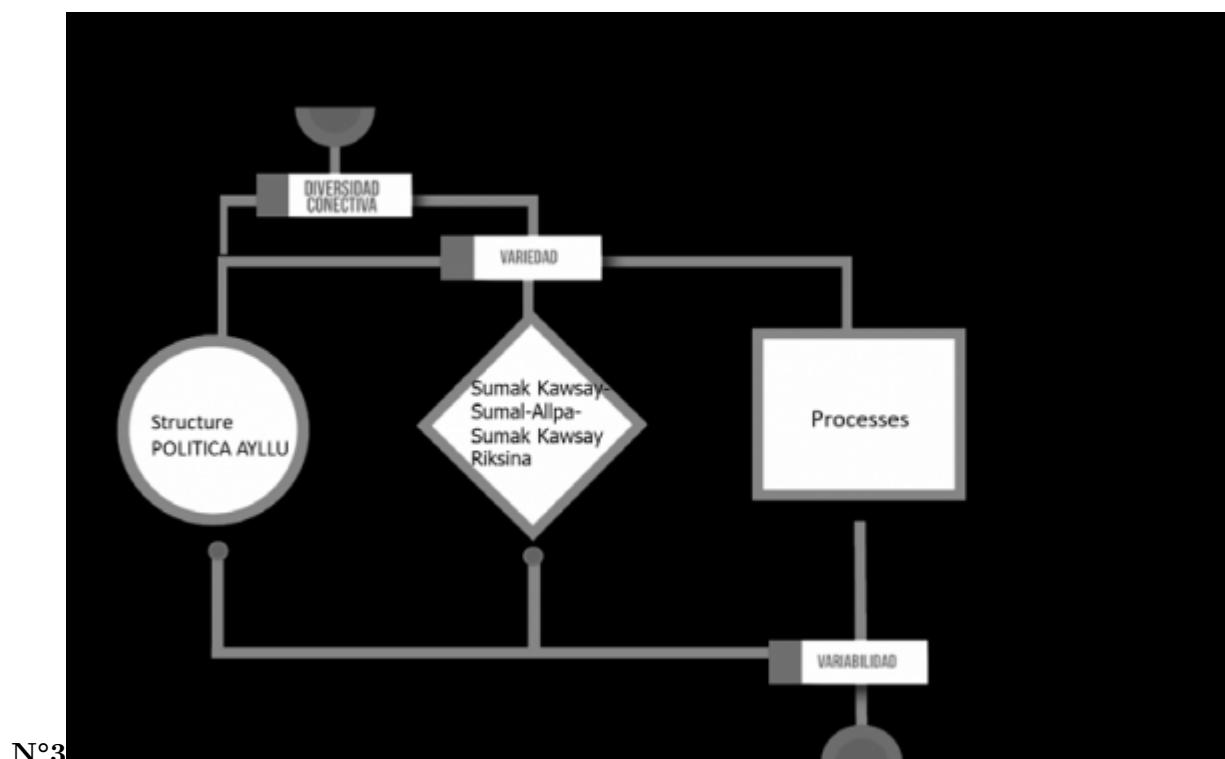


Figure 4: Fig. N°3 :

331 [América Latina en Movimiento, Nº] , *América Latina en Movimiento*, Nº 452 p. .

332 [Cubillo-Guevara and Hidalgo Capitán ()] , A Cubillo-Guevara , A Hidalgo Capitán . *Ibero-American Journal of*
333 *Development Studies* 2016. 2016. 5 (2) p. .

334 [Ashby ()] *An Introduction to Cybernetics*, W Ashby . 1956. London: Chapman & Hall.

335 [Hidalgo-Capitán et al. (2014)] ‘Ana Patricia Seis debates abiertos sobre el sumak kawsay Iconos’. Antonio
336 Hidalgo-Capitán , ; Luis , Cubillo-Guevara . *Revista de Ciencias Sociales* January-, 2014. (48) p. . Facultad
337 Latino americana de Ciencias Sociales Quito

338 [Malpartida and Lavanderos ()] ‘Approach to the society-nature unit: the ecotome Revista Chilena de’ A
339 Malpartida , L Lavanderos . *Historia Natural* 1995. 68 p. .

340 [Aristóteles ()] Aristóteles . [https://bcn.gob.ar/uploads/ARISTOTELES,%20Politica%20\(Gredos\).pdf](https://bcn.gob.ar/uploads/ARISTOTELES,%20Politica%20(Gredos).pdf) Create Space Independent Publishing Platform, 2015. 130.

341 [Vallentyne ()] ‘Biospheric foundations of the ecosystem approach’ J R Vallentyne . *Limnology Conferences.*
342 *Institute of Limnology ”Dr. Raúl A. Ringuelet*, A Boltovskoy, H Lopez (ed.) (La Plata) 1993. 1993. p. .

343 [Malpartida Del Giudice and Gallardo ()] *Cognition and territory*, A Malpartida Del Giudice , L Gallardo .
344 10.1023/A%3A1002778625641. 2003. Santiago, Chile: Corporación Sintesys.

345 [Calapucha ()] ‘Development models. Their impact on cultural practices of construction and space management
346 in the Amazonian Kichwa culture’ C Calapucha . *Serie Amazónica* 7, (Cuenca, Ecuador) 2012.

347 [Keymer et al. ()] ‘Diversity Emerging: From Competitive Exclusion to Neutral Coexistence in Ecosystems’
348 Juan E Keymer , Miguel A Fuentes , Pablo A ; L Marquet , A Malpartida . <http://www.sintesys.cl/complexus/revista2/articulos2/complexus2.pdf> SFI Working Paper: 2008-03-008. Santa Fe
349 Institute. 10. Lavanderos, 2008. 2005. 1 p. . (A relational theory of communication as an eco-semioautopoietic
350 process)

351 [Malpartida and Lavanderos ()] ‘Ecosystem and ecotomo: A nature or society-nature relationship?’ A Malpar-
352 tida , L Lavanderos . 10.1023/A:1002778625641. 10963090. *Acta Biotheoretica* 2000. 48 (2) p. .

353 [Lavanderos and Massey ()] *From Manufacture to Mindfacture: A Relational Viable Systems Theory*, L Lavan-
354 deros , K Massey . 10.4018/978-1-4666-7369-4. 2015. Hershey, PA: IGI Global. p. .

355 [Gualinga ()] Viteri Gualinga , Carlos . *Viteri Galinga, C. 2003. Súmak Káusai. A viable response to development*,
356 (Quito, Ecuador) 2000. 25. (Visión indígena del desarrollo en la Amazonía)

357 [Boltvinik (2021)] ‘Human welfare: Part two’. Boltvinik . *Anthropos Magazine* July 2021. 257 p. pp.

358 [Bretón et al. ()] ‘In search of sumak kawsay. Presentation of the Dossier Iconos’. Víctor; Bretón , David ; Cortez
359 , Fernando García . *Revista de Ciencias Sociales* 2014. Facultad Latinoamericana de Ciencias Sociales Quito.
360 (48) p. .

361 [Huarachi and Simón Cosmovivencia Andina] ‘Living and coexisting in integral harmony -Suma Qamañal’.
362 Yampara Huarachi , Simón Cosmovivencia Andina . 10.5195/bsj.2011.42-ISSN1074-2247. <http://bsj.pitt.edu> *Bolivian Studies Journal/Revista de Estudios Bolivianos* 2156-5163. 18 p. 2011. (print. online)

363 [Caguana and Delfín ()] *Organizational process of Ecuarunari: an analysis from the Plurinational Assemblies*,
364 Tenesaca Caguana , José Delfín . 2013. 2009-2011. Universidad Politécnica Salesiana

365 [Ashby ()] ‘Requisite Variety and Implications for Control of Complex Systems’. W Ashby . *Cybernetica* 1958. 1
366 p. .

367 [Untoja Choque ()] *Retorno al Ayllu: una mirada Aymara a la globalización*, Fernando Untoja Choque .
368 <https://www.eumed.net/libros-gratis/2011d/1038/index.htm> 2011.

369 [Lindeman ()] ‘Seasonal food-cycle dynamics in a senescent lake’. R Lindeman . *The American Midland Naturalist*
370 1941. 26 p. .

371 [Macas ()] *Sumak Kawsay. La vida en plenitud*, Luis Macas . 2010a. (Sumak Kawsay. Life in plenitude)

372 [Morin et al. ()] ‘The Method II. The Life of Life’. E Morin , Paris Seuil , E Paci , Torino Taylor-Torino . *Sumak*
373 *Kawsay*”. Yachaykuna 1980. 1954. 2010b. (13) p. . (Tempo e Relazione)

374 [Malpartida ()] ‘The notion of the environment in ethology (an ethos-epistemological discussion)’. A R Malpartida
375 . *Ecognition*, 1991. 2 p. .

376 [Maríaca (2010)] *The reterritorialized ”ayllu” and its ”taypi”*. The city of el alto Education and Sustainability.
377 6th Group. Symposium La Serena, Yépez Maríaca , Orlando . May / June 2010. 2022.

378 [Tansley ()] ‘The use and abuse of vegetational concepts and terms’. A G Tansley . *Ecology* 1935. 16 p. .

379 [Lavanderos et al. ()] ‘Viability, sustainability, and non-requisite variety’. L Lavanderos , A Araya , A Malpartida
380 . *The Journal of Systemics, Cybernetics, and Informatics (JSCI)*, 2019. 17 p. .

381 [Lavanderos et al. ()] ‘Viability, sustainability, and non-requisite variety’. L Lavanderos , A Araya , A Malpartida
382 . *The Journal of Systemics, Cybernetics, and Informatics (JSCI)*, 2019. 17 p. .

383