

## COMMUNITY SOIL - AQUACULTURE FAMILY SUSTAINABILITY APPROACH

*Paulo M. Serrano Neves*

*Serrano Neves Institute. Goiânia - Sede: Rua 4 n. 5 –*

*Bairro São Sebastião – URUAÇU-GO - 76400-000 –*

*Fones: 62 3357 4389 9625 5275. Internacional 55 12 3642 1452*

*E-mail- [serrano@serrano.neves.nom.br](mailto:serrano@serrano.neves.nom.br)*

### ABSTRACT

Project – Friend of the *Serra da Mesa Lake*. The Brazilian Government intends to implement aquaculture farming on 1% (one per cent) of lakes and hydroelectric dams surface – delineating a production model that contemplates market growth and social development for the surrounding population. The Serrano Neves Institute dedicated to socio-environmental education visualizes as the appropriate instrument to attach to the social platform the means to fix results of sustainable development actions - its area of performance being the Serra da Mesa Lake region - North of Goiás, BR. Socio-economic indexes point to aquaculture, net-cage fish farming, as the result to be added to this social platform. The activity as it was proposed points to eco-systemic risks if allowed introduction of exotic species. Market fluctuations may compromise the continuity of pertaining activities if compensation measures are neglected. Once native species are selected, the main compensation instrument could be within the aquaculture villa on a cooperate work system: housing facilities and basic living assistance oriented to own food production, farming inputs, animal feeding, soil farmed-in fish, and financial surpluses which are likely to determine the least dependence on the lake net-cage fish system. The necessary instruments to be aggregated are: the community real assets, financing of equivalence / product, economical-financial feedback into the fish value aggregation chain, by means of a certified acquisition title (from a socially recognized source) and a legal model of cooperative system. The main goal/result is to preserve the *villa* integrity during the income model discontinuity period.

### 1. THE PROPOSAL POLITICAL BACKGROUND

#### 1.1. The Property Social Function as a Collective Right

*Art. 5º - All are equal on facing the law, no distinction of any nature, grant Brazilians and foreign residents who reside in the Country the non violation of their rights to life, freedom, equality, safety and property, on the following terms:*

*XXII – it is granted the right over property;*

*XXIII – property will comply with its pertaining social function;*

Property right consists on use and abuse of a person/entity attributed good (that being a physical person or a juridical entity), attribution to a group of persons (company) or all represented persons (State). On a practical viewpoint there is no property without a function: houses are meant to be inhabited, companies exist to generate goods and work, streets for people and vehicles circulation. Thus, the right to property extends from the person to the public/collective while functions become more and more complexes.

Aware that people leave their homes and access streets in order to get to work or other activities, following on the example, it would not be an exaggeration to consider houses, streets and working places to be subject to some kind of order where pertaining relationships are the means to facilitate the system existence, and by using this *rationale* we find the system as being society itself - spreading out the sampling universe, each type of property constituting a facility means to the system existence, that would be its social function.

By widening our views, from aesthetics to care toward residents, exercising house maintenance, care about street traffic or ending up by generating practical use products, the social function of these three mentioned examples would comprehensively justify it. At the level of collective rights we could go to the extreme of stating that intellectual property, in the sense of knowledge mental storage, should also have its social function as a system facilitating approach, from a plain story teller to a well known writer – whether they get paid for it or not. An example of intellectual property without a social function would be a physician who does not carry on the exercise of his/her profession.

## 1.2. Social Responsibility

At the beginning of the millennium the opportunity proved to be excellent to materialize the CF-2001, Constitutional Citizenship Certificate: the Brazilian birth certificate being the diploma to be placed on a wall. Thus, whenever citizens implemented the construction of a free, a just and a solidary society through the production of goods and services – they would be entitled to an ISO-BRASIL certificate.

Table 1 demonstrates in general lines that the Brazilian Republic Constitution contains requirements that are far superior to the AS-8000 Social Responsibility Certification.

Table 1. Brazilian Environmental

SA8000 Requirements	BRAZILIAN FEDERAL CONSTITUTION
Children Labor	Art. 227. § 3º. I - minimal age of fourteen to be admitted to work, complying with art. 7º, XXXIII; Art. 7º. XXXIII – prohibition of night work, dangerous or unhealthy work activities to those under eighteen and any work to those under sixteen, except as an apprentice, from the age of fourteen;
Constrained Labor	Art. 5º. XLVII – there will not be punishment: c) of constrained work; Art. 7º. XIV – six hour work shift carried out on nonstop alternating shifts, except by collective negotiation;
Health and Safety	Art. 7º. XXII – reduction of risks pertaining to work, by means of health, hygiene and safety norms.
Freedom of collective association & negotiation	Art. 8º - It is free any professional or union association once complying with the following:
Discrimination	Art. 7º. XXXI – prohibition of any discrimination as to what concerns salary and admission criteria for physically handicapped workers
Disciplinary Practices	Labor Legislation
Work Scheduling	Art. 7º. XIII - normal work duration not superior to eight daily hours and forty-four weekly hours, allowed for time scheduling compensation and work journey reduction, by means of collective work agreement or convention;
Remuneration	Art. 7º. IV - minimum salary, as defined by the law, nationally unified, meant to comply with his/her vital family basic needs pertaining to living conditions, food, education, health, leisure, clothing, hygiene, transport and social welfare, with periodical readjustments meant to preserve acquisition, being forbidden its linking to any purpose;
Administration systems	CHAPTER II - OF SOCIAL RIGHTS

*OBS: Right column approaches only a part of constitutional prescriptions*

## 2. GEOGRAPHICAL SITE TO IMPLEMENT THE MODEL

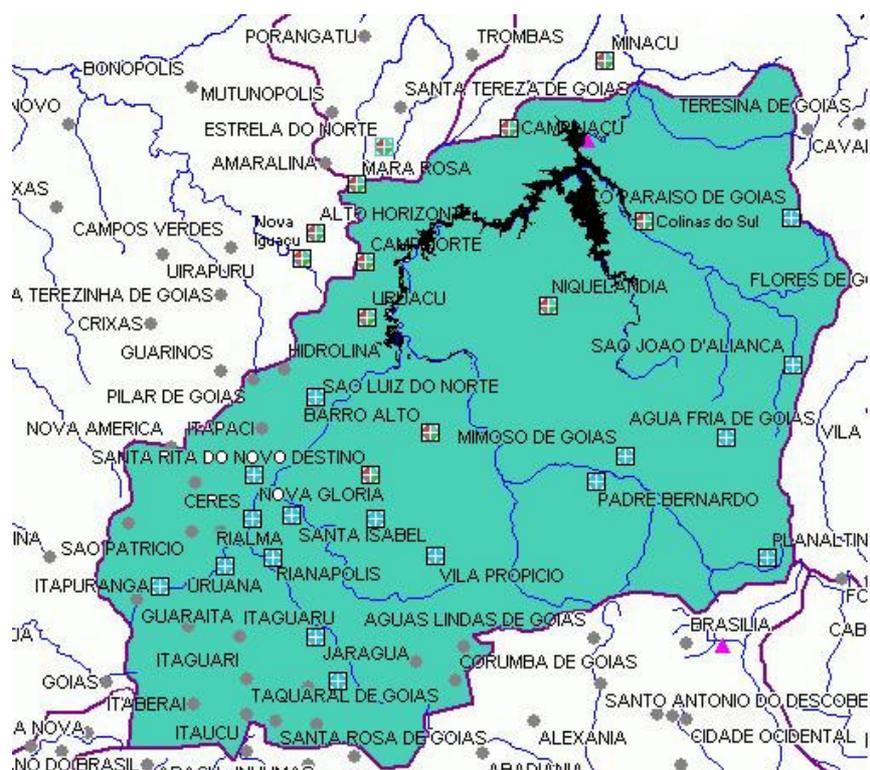


Figure 1. Serra da Mesa Lake on its main water basin

Table 2. Municipalities Which are Part of the Intermunicipal Consortium for Integrated Development of the Serra da Mesa Lake

Municipalities	Total	0 to 4 years	5 to 9 years	10 to 19 years	20 to 29 years	30 to 39 years	40 to 49 years	50 to 59 years	60 years or over
Alto Horizonte.	2564	245	246	512	455	413	278	207	208
Barro Alto.	6251	590	634	1355	1040	940	650	470	572
Campinaçu.	3707	343	372	770	630	530	421	327	314
Campinorte	9641	896	903	2071	1655	1483	1154	687	792
Colinas do Sul.	3702	423	460	867	602	442	361	255	292
Estrela do Norte	3398	312	309	728	561	521	396	259	312
Mara Rosa	11939	1082	1211	2495	2080	1899	1309	844	1019
Minaçu	33608	3310	3574	7480	6391	5190	3666	2148	1849
Niquelândia	38573	3781	3921	8792	6769	5732	4168	2590	2820
N. Iguaçú de Goiás	2746	249	258	570	501	369	322	215	262
Sta Rita do N. Destino.	3025	281	328	669	506	473	324	215	229
Uruaçú.	33530	3060	3285	7163	5738	5134	3746	2487	2917

Table 3. Municipalities Which Must Be Aggregated in Order to Constitute an Integrated Area of Influence

Municipalities	Total	0 to 4 years	5 to 9 years	10 to 19 years	20 to 29 years	30 to 39 years	40 to 49 years	50 to 59 years	60years or over
Itapaci.	13931	1350	1350	2811	2427	2224	1563	1026	1180
São Luiz do Norte.	4089	373	383	885	760	609	454	295	330
Goianésia	49160	4540	4832	10096	8888	7943	5469	3479	3913

### 3. THE SERRA DA MESA LAKE PROJECT

The Serra da Mesa Lake project was conceived as a model meant to change the tending non-participation approach into a participation process. The author opts for the non-participation terminology rather than exclusion, as the verb to exclude - transitive and transitive-relative regencies – is understood as the action of others who move away, eliminate, place on a margin, or expel, deprive, do not provide admission. Exclusion of anyone implies a deliberate act, though it does happen, which does not apply as a rule when goods and services are not available due to income, skills, interest, culture restrictions or due to any other limitation process. People do participate or not of a given activity due to diverse capacity of access. On the other hand the verb “to include”, same regency as its opponent, indicates that the someone included can be an active subject who practices the action within the universe of inclusion (agent) when the passive subject is the one who receives the action (patient). On dealing with the generation of goods and services to comply with personal and collective needs, with a minimum support, it is ideal that each person may act as an agent of generation for things meant to satisfy his/her personal needs compatible to interest, skill, and culture. Imagining the participation curve, as Figure 2, to be an ascending semi-straight line which origin is close to zero, the sectioning line in the classical society model goes through an ordained line under which are placed the non-participants and above which are the participants capable of assisting others and thus minimize the line breaking point. A current idea of “inclusion” consists on displacing the origin of semi-straight line on-abscissa where the space allocated “included ones” begin - an utopia which has been followed about two thousand years (Bible, Proverbs 31: 8, 9).

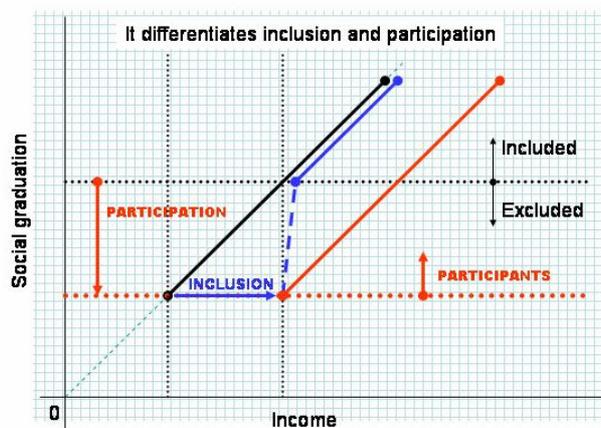


Figure 2. Bible proposal for utopy according to author

A new participation idea is to approximate the sectioning line to the abscissa axis, apparently a simple task if it were not necessary to anchor the line to avoid it going up again thus repeating the classical model.

The anchor would consist in granting the minimum needs (ordained close to zero) to be complied with in case there was a chain rupture, and also that the chain can be re-made and the previous position can be re-taken.

The feasibility to scale gains generation and retrocession as part of aggregated values - as generation moves scale up - seems to be the ideal model for a first step toward sustainable processes, providing sustainability to human beings who are placed on the lower part of the curve.

#### 4. THE TARGET

The Serra da Mesa lake in Uruaçu presents other bordering municipalities which provide a very interesting and unusual configuration, relative to 91% (ninety one per cent) of total population allocated in the urban area. (year2000).

(<http://portalsepin.seplan.go.gov.br/perfilweb/MostraPerfil.asp>)

On the forwarding Table 4:

The sectioning line was positioned for I (one) minimum salary implying that 47% of the population detains just 13% of revenues.

The first step would be to have access to 10% without a minimum income placing them as participants of a productive chain mean to raise their gains up to 1 (one) minimum salary, which can be obtained from primary activities as crafts fishing, aquaculture and craftsmanship.

There already exist craftsmanship and fishermen associations – the latter being chosen due to its function focusing the Lake.

Table 4. Relation between income and housing

	Houses	Accumulated Houses	Accumulated Income
<b>No income</b>	<b>965</b>	<b>10%</b>	<b>0%</b>
<b>Up to 1</b>	<b>3401</b>	<b>47%</b>	<b>13%</b>
More than 1 till 2	2124	69%	25%
More than 2 till 3	794	78%	33%
More than 3 till 5	894	87%	47%
More than 5 till 10	742	95%	69%
More than 10 till 15	181	97%	77%
More than 15 till 20	104	98%	84%
More than 20 till 30	64	99%	90%
More than 30	82	100%	100%
Total	9351		

The fishermen – future *aquaculturists* – live under precarious situations next to the margins of the Lake, though some of them have moved out to the urban periphery looking for some extra/autonomous work - all of them depend on that to obtain money to comply with their needs. Used to heavy work, they orient themselves to acquire some land from which to derive basic living maintenance and decent permanent housing.

It would not be appropriate to call them “landless” due to the Lake economical potential the required orientation must take over characteristic of family sustainability, mainly because aquaculture activities in the shape of net-cage depend on non controllable facts, price floating and search for fish. This family sustainability model is also an input generator toward ground and net-cage fishing minimizing dependency on external inputs.

## 5. MODEL DESCRIPTION

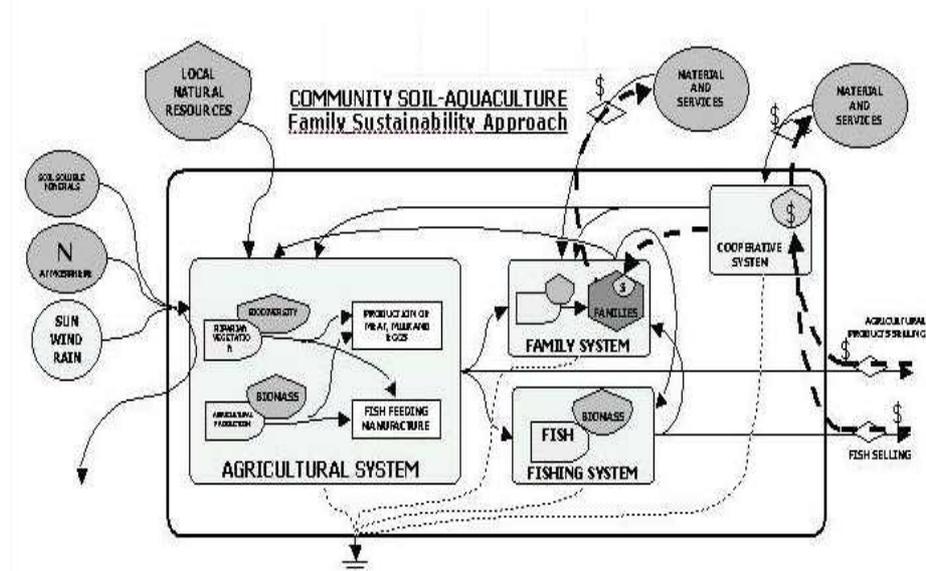


Figure 3. Proposed agriculture-aquaculture system

### 5.1. Agricultural System and Family System

The agricultural system and family system consists of a ground area to be dimensioned in relation to the number of families to be aggregated to the project. This ground area must provide for:

- Group of houses to be assigned to *aquaculturists* and their families;
- Group of buildings to be assigned to the community services: classes and training, health stations, library, leisure.
- Area assigned to animal growing feeding plants.
- Area assigned to vegetables and fruit garden.
- Composting organic residues and earthworm production (a mix of animal protein for animal feeding purposes and humus to improve soil yielding). (Be careful letters size)
- Vegetable input primary processing area (Be careful letters size)
- Store area of vegetable byproducts.
- Pasture area, corral and dairy installations for cattle.
- Swine raising area for supply with meat, animal, fat.
- Poultry raising area (for egg laying and meat supply)
- Animal feeding: manufacturing /installation area.
- Net-cage and soil area for aquaculture.
- Store area and distribution area.

The system must be assembled as to allow animal feeding production lowering or interruption without losses to family sustainability.

To make it short, the system comprehends a sustainable *villa* which depends the least possible from external purchasing/acquisition of goods – rescuing and re-interpreting old multi-cultivation land patterns that maintained workers as settlers (residents with their own small economics and minimal dependence on externalities) from bygone times when the landowner proudly stated that from the gates into, they purchased only salt, matches and kerosene for lighting purposes.

## **5.2. Fishing System**

The fishing system consists on a series of net cages, support floating installations, embarkations and fishing material. It is the (complete paragraph) It is the most fragile part of the system because it depends on quality and quantity of natural resources, which can be subject to water quality (pollution next to river mouths, algae super population caused by surrounding margins fertilization processes, unloaded from farmlands). Because this is the weakest part and last step of the cascading system, called “income module” and also because this can not be a determinant on family sustainability - the agricultural and the family system must be dimensioned in such way as to not depend on this module in order to obtain (providing income does exist) economical family growth of new commodities but which would not prevent acquisitions deemed for the family subsistence.

## **5.3. Cooperative System**

The system can be adopted – no matter which one is the juridical cooperative approach - it consists on a cooperation network where integrating parts face necessary implication links, a net characteristic that involves the community as whole.

### **5.3.1. Community Real Assets**

The role of the community, as a direct receiver of direct and indirect benefits, would be to finance regulating trading stocks, by means of a mechanism called “community real assets” i.e. products storage easily visible by community members who can exercise inspection. The community people could invest (call warrant or put warrant), being desirable the lesser value investments in order to maximize a sense of community and induce control/inspection.

### **5.3.2 Financing The Product Equivalence**

The proposal economical sustainability approach contemplates a *fish currency* as produced by the aquaculturists kind of currency they detain the know-how on. The supplying companies they would contact with would be the ones which agreed to be part of the net system, linking their supplying prices to fish yielding, contemplating de-fishing periodicity. As project partners the supplying companies would equally face price floating or demand, jointly with the aquaculturists running the same market risks.

### **5.3.3. Government Applications**

One would expect the Government to make available the financing mechanisms on a partnership like approach, by adopting fish acquisition as a way of amortization –in equal conditions as for a partner supplying conditions. The model feasibility can not depend on lost funds from government resources nor on donations. The applied economics must be real, eased only by time schedules and amortization forms that comply with the primary participants incapacity to aggregate their own capital. They have stated on a simple way that they can only pay back when they have already sold the product because all they know is to produce.

### 5.3.4. Administration

On a network model each knot must firmly hold the incoming threads, proportionally and accordingly to applied tensions, such a level of specialization or requirement does not allow for *aquaculturists* involved with trading trends or administration red tape. It is thus desirable the provision of an interface between production and market where market itself would care for affluents (inputs, financing and technology) and effluents (gross or finished products commerce) on a very specialized manner which would give priority to community members to get capacitating on such functions, highly motivating them toward cooperation meant to avoid the classical distinction between heavy load work (aquaculture) and a light approach work (desk work).

### 5.3.5. Expected Performance

- **IDEAL**

Given an ideal situation - where all necessary work concur and the present climatic situation is entirely favorable – the four levels below would represent the best performance as one would consider work variations and production outputs correlating to the system and climate.

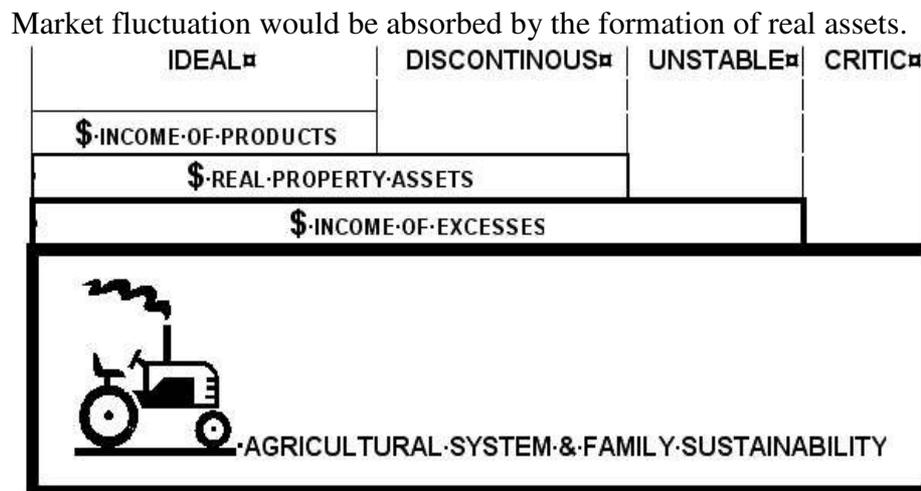


Figure 4. Community soil-aquaculture

- **DISCONTINUOUS**

Discontinuity is foreseen only for the net cage system due to water occurrences or even due to a disaster. Growing demand for fishing indicates that net cage discontinuity associated to a retraction of demand is a remote possibility. In such a period the real assets would be liquidated in order to strengthen the remaining assets administration.

- **UNSTABLE**

The system would lose stability on facing demand retraction for commercialized agricultural products, as discontinuity of the net cage system would constrain the production of vegetable inputs. Once real assets are liquidated the system tends to close on a sustainability model.

- **CRITICAL**

The period is called critical in relation to the whole system because financial commitments could demand compliance and insufficient income could demand futures

negotiation or interest payment. Being able to maintain the minimum desired means to grant human dignity would protect the associated human group.

## 6. INSERTING THE MODEL WITHIN THE SOCIAL-ENVIRONMENTAL ASSETS & LIABILITIES SYSTEM

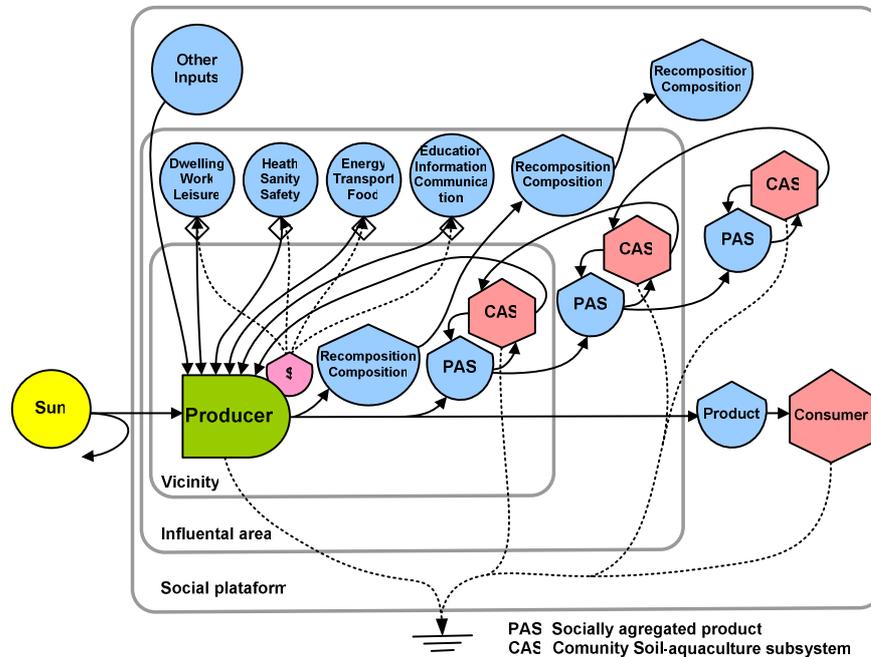


Figure 5. Community soil-aquaculture system (CAS or CSA)

**P** (above) being a producer who causes direct impact on the surrounding area of influence, and indirect impact on the pertaining social platform it is only coherent for **P** to be made responsible for a re-composition or compensation (RECOMP. / COMP) within these areas. However, such operation aims to restitute or maintain the impacted space as close as possible to what it used to be or to the best present adequacy. It is common, though, that some gains be aggregated to this operation, sometimes materialized on a school remodeling or road maintenance.

The social-environmental assets / liabilities system contemplates each producer (**P**) to have - besides the main product - a socially aggregated product (**SAP or PAS**) assigned to the social-platform for the community *consumption* purposes.

On an economic production related system one expects the aggregated social product to be at least part of the transferred gains where values are aggregated to the product in order to perform the refining chain background. B1, B2, and B3 are completing the feedbacks diminishing the traditional isolation relationship between primary producers and refiners.

### 6.1. Social-Environmental Market

Ideas, dreams, utopias aside, the market will continue to be the great master of relationships, because people need on an ever growing basis, goods and services which they are not able to generate themselves. The *savage Capital* materialized, as predator has been hunt by *Labor*, ready to take over the Master position. Nothing else, nothing less!

Capital needs to be tamed (or adapted to socio-environmental concepts) and that being so, *Labor* may put aside its rifle though it should though keep a whip at hands reach.

That was the simple vision which entitled me to see traditional market as the platform to develop a new market concept and which made possible my contribution to develop “State-of-the-art: Environmental Commodities”. However, I was concerned about the possibility of traditional practices – being quite strong ones - to curb development due to virtual sectors resistance (financing) inclined to generate artificial movements.

Thus, beyond a new market, I have drafted – and now I provide the blueprints – a mechanism able to integrate production chains & services, by means of re-feeding all circuits.

It is not a model which I have created, as it is found within nature, depicted by its cycles and products format - one example I bring about being crystal, a simple beautiful and economical structure.

Far from me the idea of compulsively committing the economical results of the involved activities (it would not democratic) I could however suggest, “*slow down folks or sooner than later it will be all over*”.

Efforts have been maintained toward sustainability but I somehow detect them as directed toward the traditional sustainability model i.e., developing means which perpetuate the style of doing the same old things for a longer period of time. My proposal is simpler and it preaches doing more agreeable things, which would also, by themselves, last longer.

*Other things* also include doing other things with capital - on a wider concept adopting intelligence as capital, wellness as capital and so on; however adopting the concept that money rules all it should then be placed in the field – to be played with.

## **6.2. Participation Certificates at the Formation of Social-Environmental Assets**

- 1) Social and environmental investments are value quantified and already accounted for in the Social Balance, subject to incentives and foreign certificates of Social Responsibility.
- 2) Environmental damages are subject to values assessment and already accounted for the purpose of fines and repair/reconstruction dictated by the regulating entities.
- 3) Social damages are also subject to values assessment for the purpose of fine and repair as dictated by the juridical entities.

The alchemy consists on:

- a) expansion (1) of incentives and endogenous social-environmental certificates, extending social responsibility toward Social Commitment, deriving a social-environmental result;
- b) expansion (2) to reach degradation for not acting on conservation, and expansion (3) to reach degradation for not acting on conservation and evolution;
- c) convergence of forces (see (2) and (3) ) to obtain social environmental result..

(a), (b) and (c) require money to carry them on but it may happen that one does not have enough of it – however if duties are to be shared many can do what one alone is not able to.

The idea, in summary – experts are to develop the molding ways – is to upgrade Social Balance to Socio-Environmental Balance in such a way that all investments on environment that border human beings may be accounted for as well as all effluence

from production and services be appropriated, even when mentioned effluence is associated to a given activity, as it is the case of automotive vehicles discharged fumes.

Re-observing the Figure 6 it becomes perceptible that the methodology must contemplate the bordering circles, providing from a smaller to a greater complexity, besides dimensioning connections and interferences among circles and re-feeding circuits, applying the saying “divide to govern” in a positive sense, where smaller groups web relate.

It becomes evident the need of some legislation to cover up the entire spectrum, though a democratic space provides for volunteering activities, not cooped by incentives.

Difficulty facts are pre-existing ones and I consider as the most evident one *to live in a fenceless condominium*, experience which has not been consolidated as yet because it depends on a more mature educational/cultural level from which one learns how to use the private space without defiling the common space.

Over the same structure one can place the background flow diagram, integrating other elements such as NGOs [community operators], OSCIPs [government operators] and governments themselves:

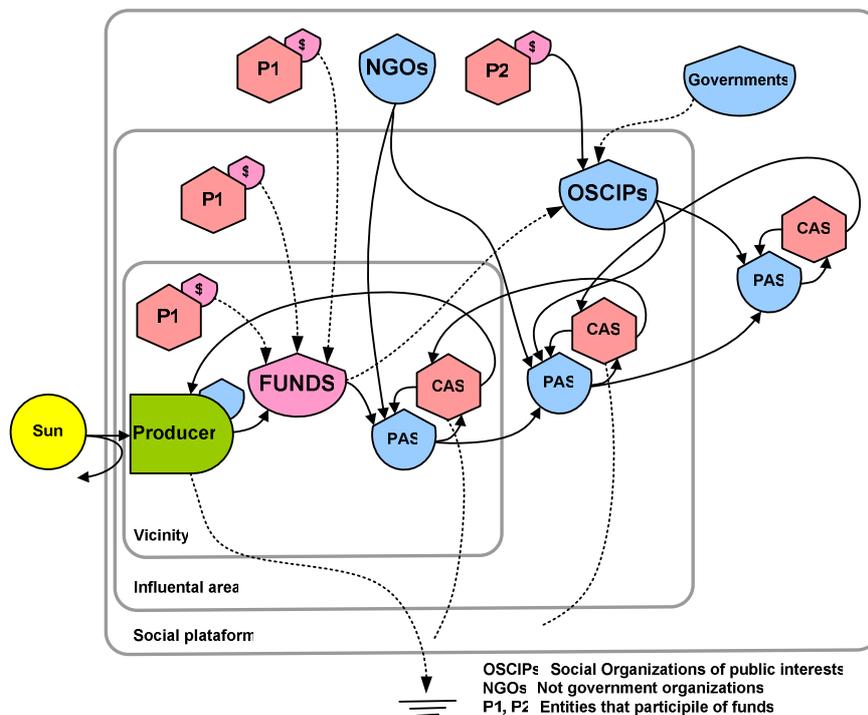


Figure 6. Spatial arrangement of proposed system

[P] is presented as the FUNDS parent company, subject to impact and load evaluations and also the author of the project management.

[FUNDS] an entity to be legally defined meant to shelter administration and funds of parent company and participants.

[P1, P2] physical or juridical entities, participants of the Funds, who look for the Participation Certificate acquisition at the Formation of Social-Environmental Assets, either because they do not detain management capacity or because they opt to be part of the project by simple adhesion, case in which they would not have a social-environmental obligation to comply with.

Worth mentioning again is that the Social-Environmental Assets are dispersed or diffused on the social platform – space external to the company. Such assets represent the company patrimony but they are not feasible to be liquidated as in a case of bankruptcy or extinction, by that they do present themselves as solid but they do not constitute a warranty for current operations.

Assets are subject to holder's transfer, acquisition in case of bankruptcy or extinction, or incorporation - if the parent company loses management capacity.

This line of thinking presents a juridical constituted Foundation as the safest and more dependable model because it is universal, perennial and directly inspected by the Public Prosecutor Office (where social environmental functions are held and dealt with).

Experts are to manifest themselves on the Funds legal and accounting wise configuration.

## **7. THE IDEOLOGICAL SUPPORT FOR SOCIAL- ENVIRONMENTAL EDUCATION**

The non fixation of benefits allocated to the social platform is a constant approach in Brazil, empirically seen as the fruit of a culture formed and developed from Brazil's discovery times (1500) and settlement from which resulted a formidable diversity, still apparent on European culture residues and pockets of poverty. Used to receive directly from the Court the needed goods - originated from Negro, white and miscegenetic slavery – Brazilians at the lower end of the social scale seem to be always waiting for something from the Government to reach them not even considering a counter parting action (presently the so called *basic food hamper* and different exchanging coupons).

Thus, the benefits that depend on the beneficiaries' direct participation can do well - as long as resources flow into and, their administration is externally provided. They do not acquire synergy and quickly degrade - either because they lack proper administration or resources.

Anchored in this cultural background – in which the social platform is a feedback contributor – one can easily understand that people should receive some level of education to permit people to assimilate the functioning of the model and effectively participate on its construction and functioning by acquiring synergy and no longer depending on external administration.

Ideological support is citizenship itself and the instrument of its construction is the social-environmental education policy, which permeates all the community.

In terms of utopia this is the point that outstands and shines out because paradigms that have been surviving for half a century, must be overcome.

Social-environmental education can be a Social Product that dilutes difficult approaches while simultaneously forms social-environmental actors to feed the growing awareness chain and in turn will put the investor's assets to grow.

Social-environmental education is simply the repriming of education as taught in the first half of last century which consisted on preparing people to live within the community. This education tended to sustainability as it prepared to preserve local practices while moderating growth. At that time people were oriented – led – to remain within their communities and strengthen connections. Just exceptionally positive cases were stimulated to look for the big city.

Education guidelines formed the social pattern. They were strong ones and granted for the “social cloth” whatever the print and weaving, not to get stretched out limits.

Social-environmental education inserted into the regional bordering context and area of influence, at the Serra da Mesa Lake adduction, comprehend a consortium of actors, all present on the stage and linked into an open, flexible and public planning - however centered on private initiative capacity – able to visualize the field and adjust practices to assure future availability of natural resources. Such adjustment trend is shown on responsibility and quality certification which are extended to the social-environmental aspects due to a growing demand for products and services that can provide comfort and wellness, leading to care toward the living- in platform, meant for human being enjoyment.

Clean production, responsible consumption and a clean world where production and consumption acknowledge future generation requirements toward same production and consumption needs.

Forecasted changes on energetic matrices and some announced resource restrictions date back to a past of overuse - pointing out toward the modeling of a new development pattern to be from now on managed by children – the real *bearers of rights* for the future.

Children social- environmental education aims to be the instrument to develop the embryo of such new awareness - which jointly with their mothers are the powerful allies to build a future of wellness.

## **8. CONCLUSION**

Brazil is a country of relevant territorial dimension and diversities, distances and disparities undoubtedly have contributed toward its scientific development though it has managed to maintain social poverty and culture on low levels

Ecology sciences seem to know all about the planet.

Economics sciences seem to master the art of transforming the planet into money.

Eco-economics is on the move.

It is not enough.

The idea that human beings are active subject of transformation and passive subject of transformed results is the same one that whatever sustains life also anticipates death.

Graph curves show resources deprivation allied to the popular prophetic interpretation that one would get into the year 2000 but would not overcome 2100. It is a simple but not an easy choice: to live less with more or to live more with less. "H" (as the human variable) determinates the equation and only education toward sustainable living would prevent "zero" as the result for all intelligence efforts.

## **ACKNOWLEDGEMENT**

To Otavio Cavalett and Oscar Sarcinelli, post-graduate students of Laboratory of Ecological Engineering -FEA-UNICAMP, for their kind help with figures drawing and editing.