

DYNAMICS OF SOCIAL DEVELOPMENT

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Abstract

We created a metaphor about a little village in order to discuss mental models associated with economical development. The metaphor facilitates the acquisition of social comprehension, based on behavior and interaction of actors. Through a system dynamics model, which represents the socioeconomic activities of a little town, it is possible to generate and support pedagogical processes and the discussion of decisions and actions of actors.

Our approach to poverty and development integrates systems theory, systemic economy, and sociology. The fundamental question is about the ability of individuals and communities to generate wealth. Existence of an individual in a community can be understood as a continuous flow process, which is not transient, and where generation and consumption of welfare is permanent.

The last part of this work discusses the application of the proposed methodology to social prospective. Through the use of system dynamic models, we analyze the creation of plausible socioeconomic scenarios. We don't pretend to conclude or state a development model. Instead of that, we propose a pedagogical exercise in which a conversational space is generated and mental models can be discussed in order to gain insight about welfare and individual development.

1. Introduction

The main interest of this document is to generate a dynamics of discussion about development, poverty and welfare, and at the same time, about the mental models we associate with those concepts.

Our approach to a constructive discussion - scheme is based on the observation of economical and social behavior of individuals and companies. Behavior is conceived as continuous flows of production and consumption of wealth. We model and simulate those flows by means of system dynamics.

System dynamics is appropriate to simulate this continuous flow and decision making processes. System dynamics models have the capability to represent the various perspectives of the participants of conversational groups and in that sense, it allows to re-elaborate the mental models we have about economic development and poverty.

Through the development of a microcosmos, named village of Gaula, it is possible to simulate and evaluate events from which pedagogical processes start. Different from microworlds, which simulate processes, microcosmos are thought of as situational spaces

where structured discussion can take place. The microcosmos allows also the proposal and evaluation of different scenarios of development. Our objective is to promote the discussion of development paradigms and poverty alleviation.

The metaphor of village of Gaula

Gaula is a little seashore village in a tropical coast. It is located in a quiet and beautiful bay where boats anchor. Navigation is the main form of communication with the external world. Behind Gaula, moving into the continent, a huge tropical forest extends.

The inhabitants of Gaula have a quiet life, divided between subsistence agriculture and fishing. Dozens of families in town sow, fish, eat and sleep in a bucolic tranquility, which modern world finds quite exasperating sometimes.

Martín, the fisherman

Martín is one of the fishermen of the village; he and his son Pablo are rowing slowly to a near shallow where there is good fishing . With them is Arturo, one of those young executives who likes ecological tourism, and who are coming with some frequency to town.

Observing them row, the curious executive ask them:

Why don't you get a small engine?

What for, boss? Answered Martín

With a motorboat you would spend less time going to the shallow. You could also extend the fishing net and carry more fish.

But, what for? Answered Martín again.

In that way you can sell much more fish, and obtain good revenues

What's the use of it?

Martín, –the brilliant executive answered impatiently– with your revenues you could buy more boats, and as time goes by, you could secure a rent.

What for, boss?

Disconcerted and angry, Arturo told him:

Well, with a rent you can do to whatever you like to do the most

That's what I'm doing now¹

The cultivation of tocos

Arturo was delighted with the taste and texture of a rare crustacean that Pablo brought home, and that he had never eaten before. Wanting to know where those delicious tocos came from, he decided to join Pablo in his search. They walked through the shore and reached an estuary, the entry of a lake. There, Pablo showed Arturo what constituted his motive of pride and joy: his tocos culture.

¹ This first chronicle is based upon a popular story

Pablo cultivated those wild crustaceans, which could only before be recollected for a few weeks a year. In ordinary baskets, tied to the mangrove trees, groups of tocos were fed with fish and wild plants that Pablo obtained. He had experimented since his childhood and was now proud of his refined technique.

Arturo was fascinated with the scene. With carefully attention, Pablo followed a sequence of cleaning, organizing and revision of his culture. He finally took some tocos and disposed himself to come back.

Could you cultivate more tocos, Pablo? Asked Arturo

As many as I want, I think

So, what prevents you from doing it?

Nothing, only that there's not need, as well as there's not need of more beans or rice either. I would like to take some home.

Of course, take all that you want you'll be a hit with girls, answered Pablo with a saucy smile. What else are tocos good for?

Industrious Arturo sells tocos

Refreshed, happy and excited, Arturo went back to work. In his neat office there were dozens of e-mails, requested appointments, orders, and friendly messages waiting for him. As usual, he had a business lunch. He decided to invite his clients to his favorite restaurant: one specialized in seafood; something that Orientals particularly like. He would have the opportunity to surprise them with a first dish of tocos, those exotic crustacean he had brought from his vacation, and that the Chef, accustomed to the demands of his clients, had accepted to prepare with one of his special sauces.

As expected, foreigners were fascinated. Arturo talked, talked, and talked about his experiences in his uncommon vacations, and as a joke he added: –Of course, if you are interested, we can export tons of tocos to your country; it will be a success for sure. A few days after, one of his oriental friends called: he had the first order of tocos. Would he like to be a tocos exporter? Arturo could only think about that little question that tormented him: What for, boss? However, he soon recovered from his surprise: this was the challenge of any globalized yuppie; he will be a tocos exporter.

Arturo traveled to Gaula the same week. He talked to Pablo, and carefully organized an exporting company. They started to sell tocos; gradually, markets were opened and some families in the town became wealthy. Among other improvements, there appeared power plants, communication devices, data systems, refrigerators, and televisions. Arturo invited his friends.

2. Basic model of welfare generation

One way to understand socioeconomic activities of individuals consists on observing them within a continuous flow of generation and consumption of wealth. From this perspective, a poverty or wealth state is associated with the magnitude of welfare flows received by an individual. The welfare flow would be sustainable or not in time, and its magnitude will depend on the wealth of the individual and his ability to obtain more wealth. The diagram of continuous flow of Figure 1 better illustrates this situation.

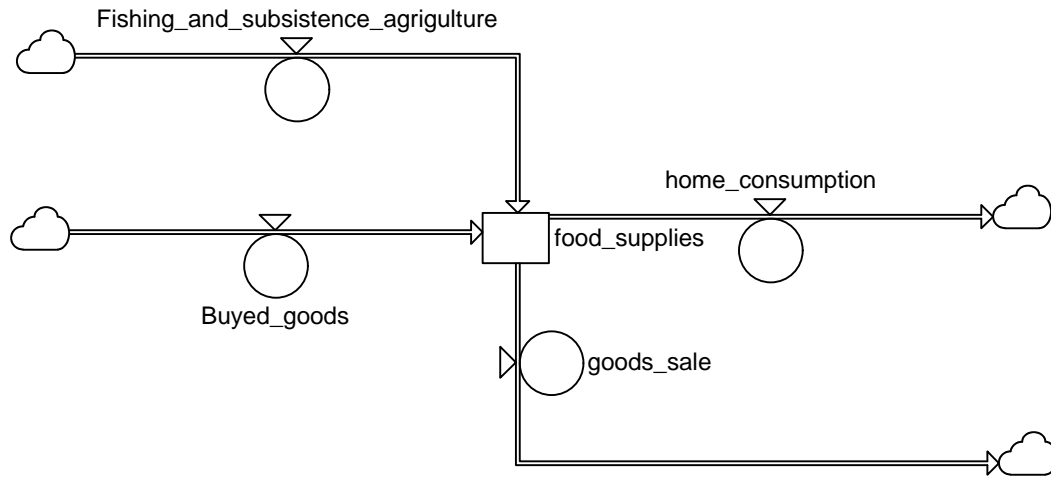


Figure 1. Continuous flow of welfare

Martín, our fisherman, provides his larder with his daily fishing and subsistence crops. He buys other goods he needs with the money that obtains by selling fish. That is the way in which he attends his necessities.

The sale of his products implies that the basic economy of the town interacts permanently with external markets. Exchange takes place in a monetary market economy, and he sells his products at prices representing the value given by the market. Similarly, Martín acquires goods at a buying price. Figure 2 represents the dynamics explained above.

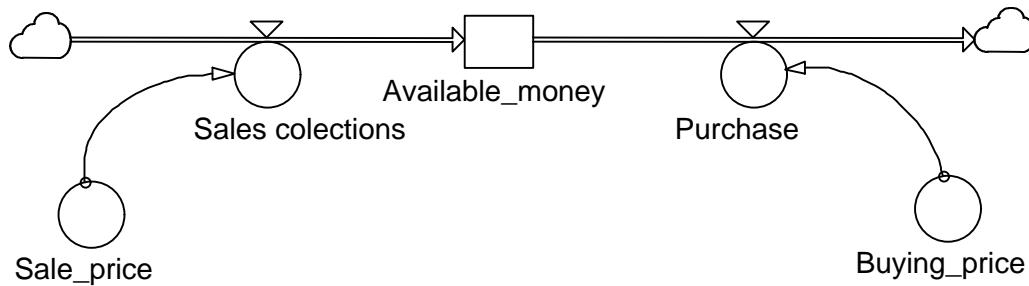


Figure 2. Monetary flow

The buying capacity of our fisherman will be closely related to the availability of money, resulting from his revenues, and from the expenses generated by the products he must buy regularly.

Figure 3 shows more completely the dynamics of the continuous flow of generation and consumption of welfare of our fisherman. Thanks to the nature, he has a basic welfare stock, with which he does not require more elaborated schemes of social integration to obtain his sustenance. The primary exploitation of land and sea allows him to subsist. His economical needs are determined by his consumption pattern. Consumption patterns are introduced in the model as tables, showing the consumed goods in each time step.

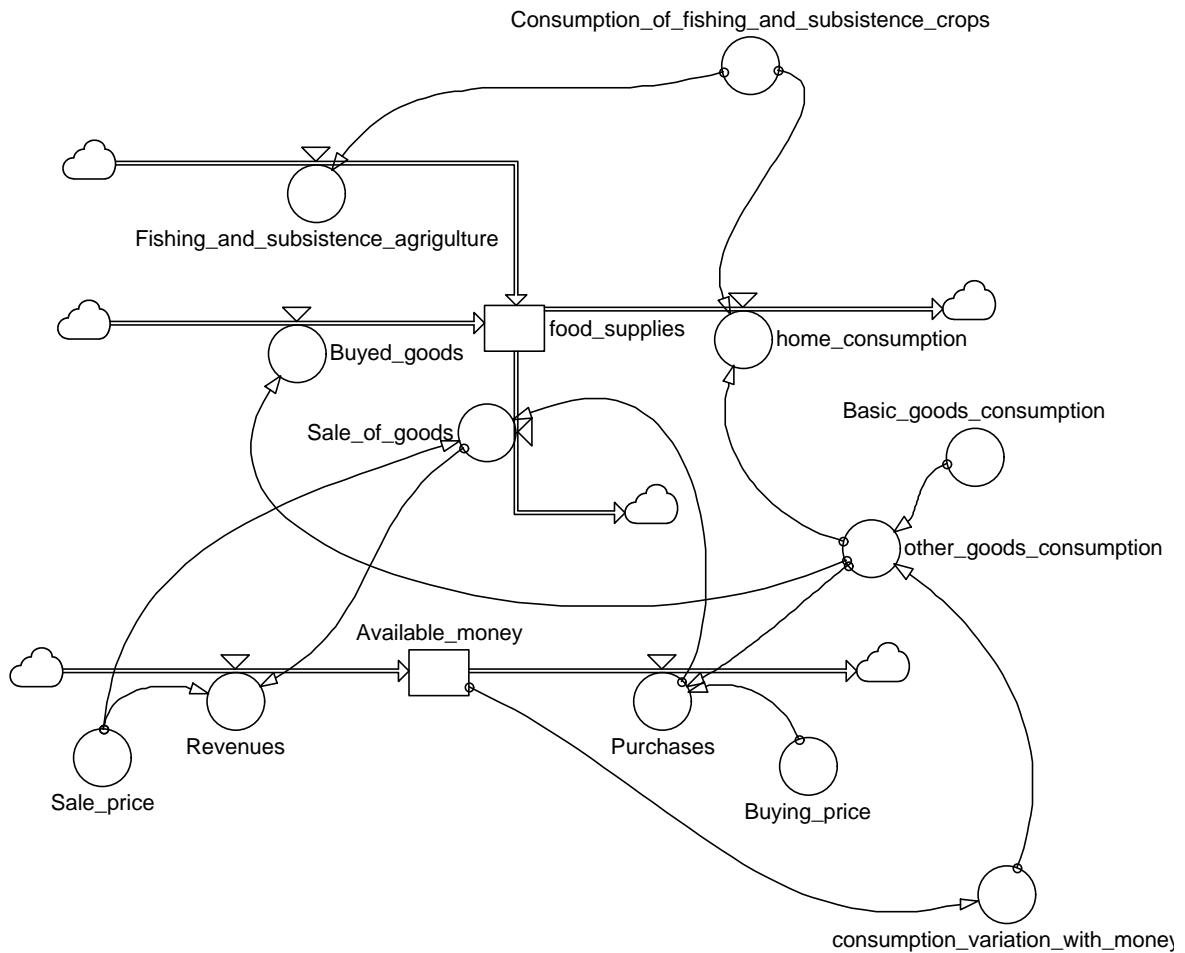


Figure 3. Dynamics of continuous flow of welfare and consume

With time, decision patterns of consumers may change. At first, there is a subsistence and primary realization scheme. The fisherman spends his earnings in basic goods; he fishes and buys until his needs are supplied. In a more elaborated scheme, he would buy as many as he can, according to his earnings.

Through simulations, we can observe the behavior of the system, and support the discussion of the following questions:

- What form do consumption patterns have?
- What happens when the needs - scheme of fishermen changes?
- How can a level of poverty be established?
- What happens when there are changes in the rules of exchange; for example, when prices rise?
- How much welfare is generated, and how much is obtained?

3. Model of welfare - generating companies

We place the company within a continuous process of welfare generation. Significance and worth of companies, as social enterprises, depends on their contribution to society. This contribution is materialized in a permanent flow in which resources and individual work integrates to generate a good, service or knowledge useful for others. The tocos - producing company of Arturo and Pablo is configured as in Figure 4:

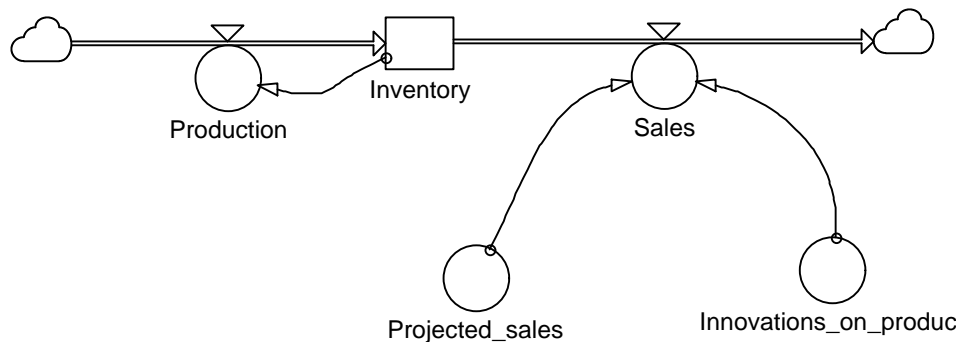


Figure 4. Continuous flow of generation of tocos

Levels of production will vary according to the revenues and the projected sales. The introduction of tocos to the market was an important innovation, which allowed that some individuals created a company. Innovation is a path for expansion and economical integration. Dynamics of tocos' production creates an inflow of money, channeled by the company, as shown in Figure 5.

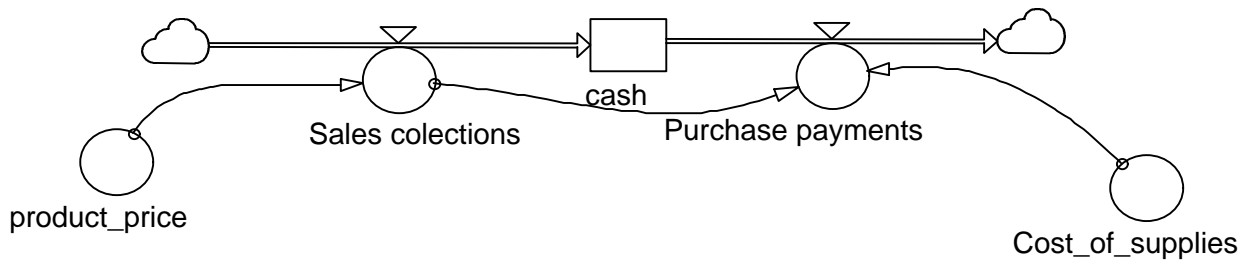


Figure 5. Monetary flows in the Tocos Company

Sales generate revenues, while the company has to pay for its resources. The price of sold goods may change in time, and the behavior of resources' price is similar. The greater the activity of the company is, the more wealth the community related to production of goods receives. The complete model for generation of goods and cash flow is shown in Figure 6.

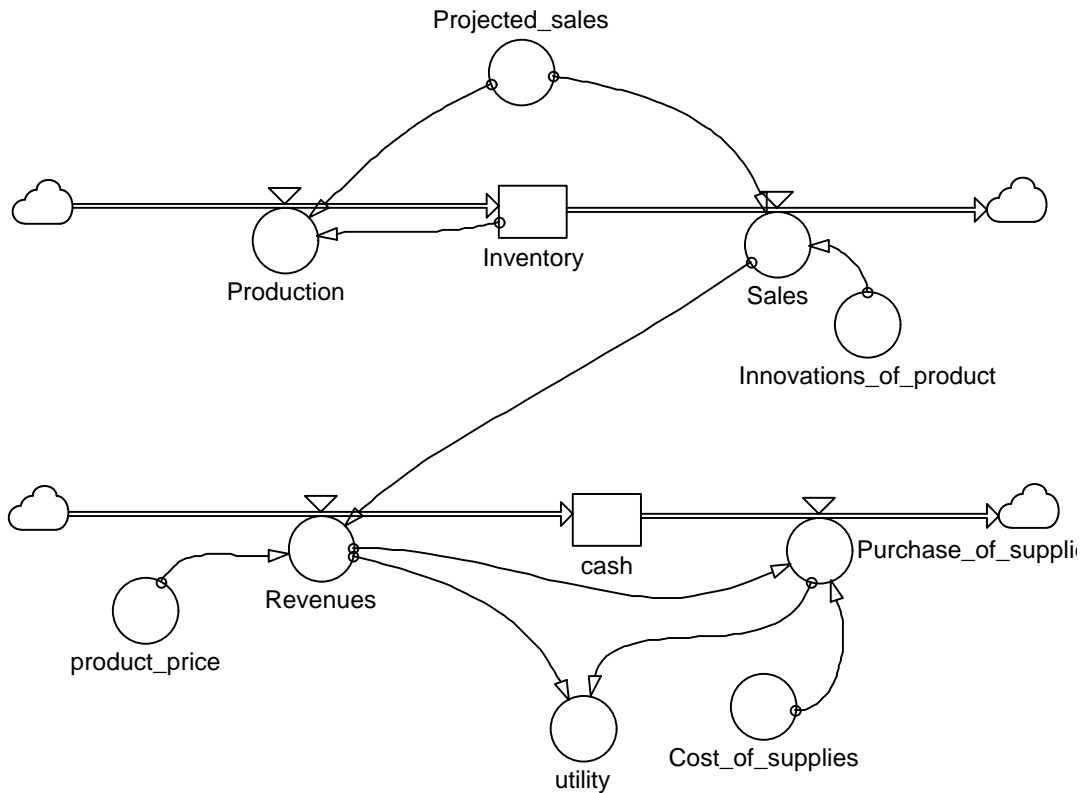


Figure 6. Model of welfare generation companies

As before, simulations allow to observe the system's behavior, and to support the discussion of the following questions:

- What role do technology and innovations play in Gaula's economy?
- How is the economical activity affected by dynamics of prices and costs?
- Is the system sustainable in time?
- What is the character and objective of utilities in the model?

- How can the impact of payment of supplies be evaluated?

4. Economic model of welfare generation

An integrated model of the economy in Gaula village allows a detailed revision of possible scenarios for the configuration of economical and social life. That model can be observed in

Figure 7. Total revenues of the economy are the sum of the traditional internal sales and the sale of tocos. Revenues constitute a continuous flow, which we represent in monetary terms, in order to consolidate them.

The number of employed families depends on the economic activity level. Families receive rents and salaries, which are destined to consumption. Producers and suppliers of tocos and other goods and services, receive money for their external sales of tocos and fish, and at the same time, pay for the bought goods. An inequity indicator expresses how many times is the income of the wealthier 50% of population greater than of the poorer 50%.

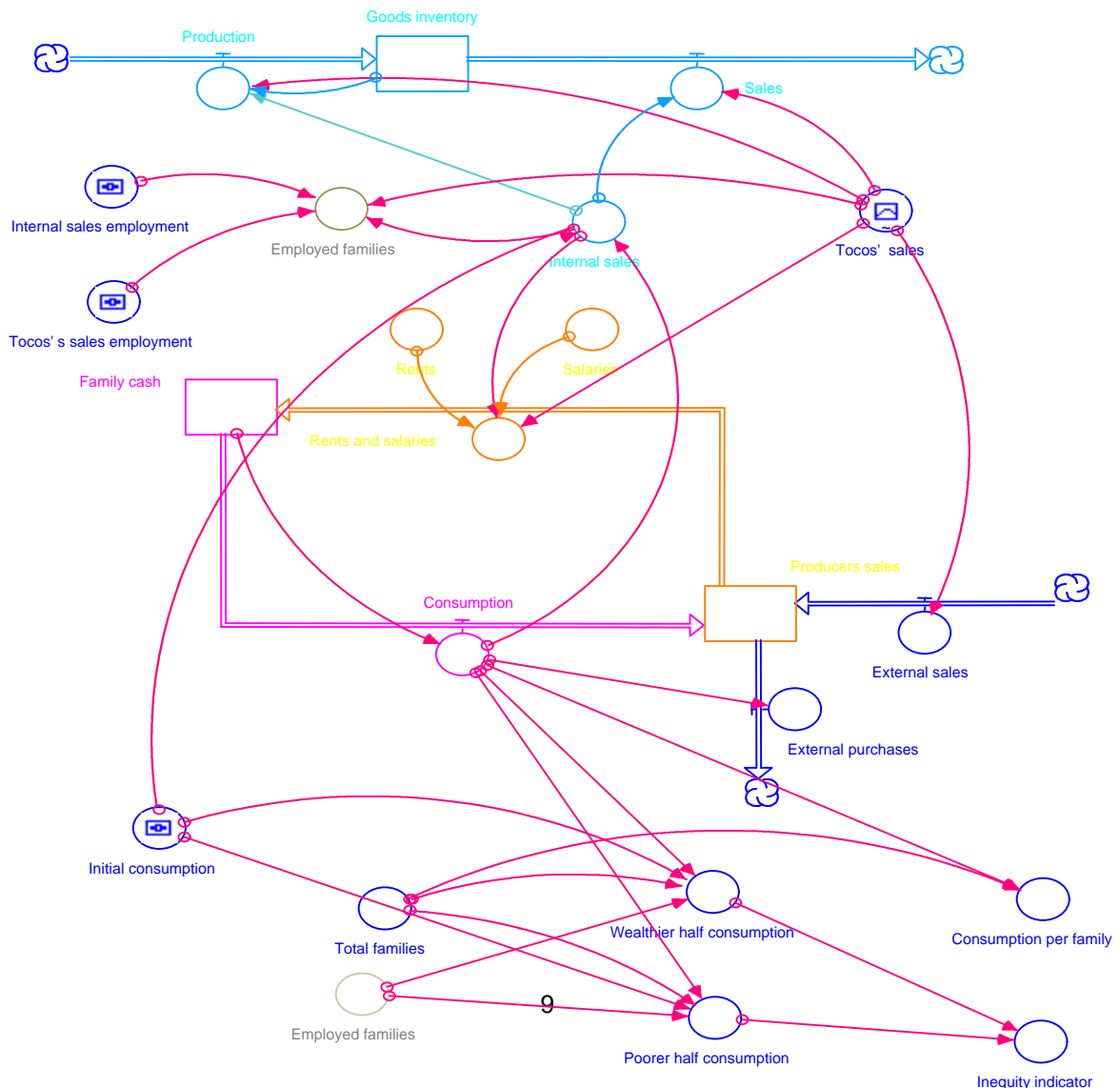


Figure 7. Economy of Gaula Town

The model presented above will be used to simulate different configuration options in order to study the system's behavior and illustrate the discussion of the following questions:

- How do society members integrate to welfare generation?
- What is the meaning of the inequity coefficient? Is its increment undesirable?
- Is the system sustainable in time?
- In which way can the economy of Gaula be transformed by tocos' sales?
- How to evaluate the impact of payment for resources?

5. An initial discussion of the problem

In this section we pretend to find relevant elements for the discussion of the process of integration of welfare generation and economy. In a third-world country street we can observe a person, collecting trash and loading it into a wooden cart, pulled by a horse. We could see also a humble fisherman, rowing in his boat, as Martín does. Scenes as those suggest different interpretations.

From the neo-liberal perspective, the individual would be recommended to look for a job that provides him and his family with the adequate maintenance. It would be stated that labor market rigidity inhibits an appropriate employment level and that fiscal-contribution costs of contracts cause that employers don't generate enough jobs.

Social-democratic assistance provides another common point of view. The inability of State to guarantee the satisfaction of basic needs of population, as well as the utility of social programs and unemployment assistance would be discussed. A third approach would argue about inequitable distribution of income, lack of social justice, and property concentration. More over, it could be said that this situation demonstrates the inability of capitalism to satisfy basic needs of all population, and that it is necessary to change social structure.

Our approach is based on systemic economy. First, the two discussed scenes could be no comparable, because in each case, the state of social exclusion and marginality is different. Although we accept the main statements of the three discussed perspectives, have also profound disagreements. The central problem is that those individuals are generating the most basic level of welfare, within very simple mechanisms of monetary economics. The retribution they receive for their work is only enough to buy a limited quantity of goods, which support a precarious living.

One of the fundamental problems in poor societies is the low level of social integration of individuals in the generation of welfare. It is common to find societies in which 60% of population is trying to obtain some of the wealth generated by the 40% left. We must solve the problem of generation of welfare to this 60% that is unemployed, dedicated to subsistence activities, marginal, or in absolute poverty.

The main subject is then to integrate those individuals, in an effective way, to the generation of welfare. By receiving an income, and being part of social processes, those persons would improve their life conditions, overcome social exclusion, and become happier. In order to meet this objective, it is essential develop the individuals' skills for working, social integration, effective participation in organizations, and building of social and ethical schemes.

A life-long education of individuals for labor is a priority in the creation of societies with high levels of social and economical integration. In a recent study about education for work, Luque annotated:

"It exists an ample international agreement with respect to the fundamental importance of human resources formation, in particular in modern fields of knowledge, as a condition for development and modernization of the production capacity of any social group, called nation, company or region. From this ability of development of productive forces depends at last, wealth generation, productive jobs and incomes, without which it is impossible to improve the living level of population, both in its material and cultural dimensions" (Luque, 1999 p.99).

When interacting with others, individuals generate value. Entrepreneurial competitiveness is built upon human capital, able to assimilate an increasing technological complexity. The new comparative advantages are based now, not in a cheap labor force, but in a skilled labor force. This is more evident in the society we are currently building, on-line, automated, computerized. As Guiddens states: "Today less than 20% of labor force in most developed economies, is in factories, and this proportions continues to decrease". (Guiddens, 1999. p124)

Education of labor force for employment has direct effects on wealth generation, social integration, competitiveness, and income distribution.

"Full employment is the most adequate instrument to obtain distributive results in short term. Redistribution of properties, such as land, or corporate property in industries, has an effect within five or ten years but in spite of what agrarian may think, its effect tends to deplete. Education appears as the most efficient mechanism to attain sustainable and permanent redistribution of income and wealth, although its effects are only evident in medium and long term". (Forero, 2000)

It is possible to obtain an improvement in income distribution by increasing generation of those who were not effectively integrated to the productive system of society. When the income of people generating the less welfare grows in a rapid and significant way, the indicators of disparity between poor and rich change drastically. In that sense, the problem

is not wholly, nor fundamentally, property and the distribution of actual income. The problem consists on the necessity of generate more wellbeing by and for who are totally or relatively excluded from the welfare - generating social system.

In simple terms: for third-world countries, the problem is not to distribute the little milk produced, but to produce enough milk for all population. Following this idea, Giddens annotates "Cultivation of human potential should replace redistribution as much as possible". (Giddens 1999, p121)

Another aspect to be considered is the effective generation of employment and technological abilities required by employment. This conduces to the systemic problem of generation and expansion of companies, the subject we will discuss in the following section.

Our reflection centers mainly in generation and expansion of the companies integrated to global commerce. As could be observed in the systemic model, creation and consolidation of long-term demand is the axis of economical growth, both for companies and for society.

Demand is generated basically by means of expansion of internal or external demand. When internal demand grows, it produces the expansion of the productive system and the integration of a larger number of persons, in a more productive way, to social welfare generation. The expansion of external sales not only contributes to demand growth, but also constitutes a mechanism for increasing the internal demand.

Entrepreneurs play an essential role in economy, by taking decisions of investment and expansion of the system. Shumpeter describes this fact as follows:

"We have already seen that the function of entrepreneurs consists on reform or revolutionize the productive system by exploiting an invention, or in a more general sense, a technical possibility no experimented before, to produce a new merchandise, an old merchandise with a new method, to open a new source of raw materials, or a new market for production, reorganize an industry, etc.". (Shumpeter, 1983, p181)

Around the world, the produced goods and services are each time more dependent of external technology and materials. There will be welfare if internal production is competitive and valued in global markets. Barriers for exchange deprive countries at last from resources and goods valuable for wellbeing and technological development. From the previous discussion, we can extract the basic proposal of generation or consolidation of companies and organizations of first world-class, with the ability to export and widen external market.

6. Simulation, social scenarios planning, and social pedagogy

In this section we will discuss various approaches to the problem, based on the formulation of possible scenarios. We elaborate the theoretical discussion and the specific application of models of discussion, conversation, explicit agreement or disagreement, as well as simulation of resultant scenarios.

Capitalist enterprise scenario

Pablo and his client, Arturo, follow a growth dynamics, towards the consolidation of their company and their wealth. They pay the due salaries, but are cautious with their patrimony. They strictly avoid competence when possible.

Persons somehow bounded to the company have improved their income, and become to demand a wider variety of services and goods, now that they have the opportunity to buy them. The village starts to transform its structure; there appear stores and suppliers of recently demanded services.

As the company expands, more persons in town are related, in a direct or indirect way, to its activity. The village is now different, and its structure begins to appear disassembled. In one hand, there are families that conserve their old lifestyle. On the other hand, there are families connected to the company, or to the social systems attending their needs and the needs of the company. In a distant extreme is Pablo, owner of the company.

Figure 8 shows the results of the simulation for this scenario. Employment in tocos' cultivation occupies a large number of families, but not all. The representation is based upon a production model, which is more intensive, and employs fewer families than the cooperative production model. Mean consumption per family grows in a significant form and the inequity indicator decreases progressively from a maximum, where the number of employed families was less than a half of total.

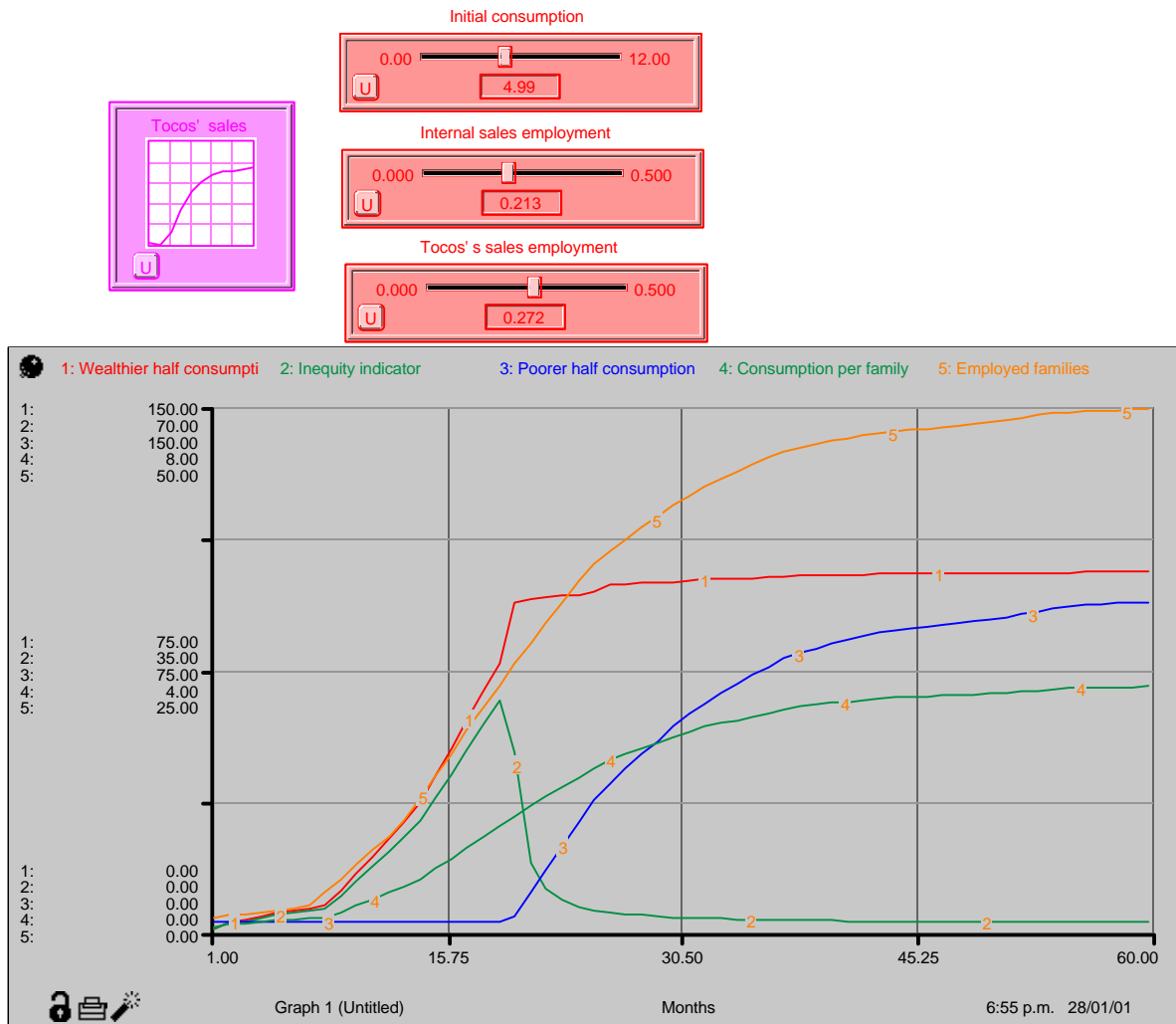


Figure 8. Capitalist scenario

Social construction scenario

The village moves its activities to cultivation of tocos. Production develops gradually, and all the families participate in it. A social network is articulated, new services are created and welfare irrigates all society. Although Pablo and Arturo obtain important utilities, are well integrated with community.

Demand of multiple services generates more enterprises devoted to satisfy it. Poverty indicators decrease in general. In Figure 9 the result of simulations for this scenario can be observed. Employment in tocos' sale is more extensive, generating a higher degree of participation of families. Inequity level decreases rapidly, and consumption in families grows in a considerable form.

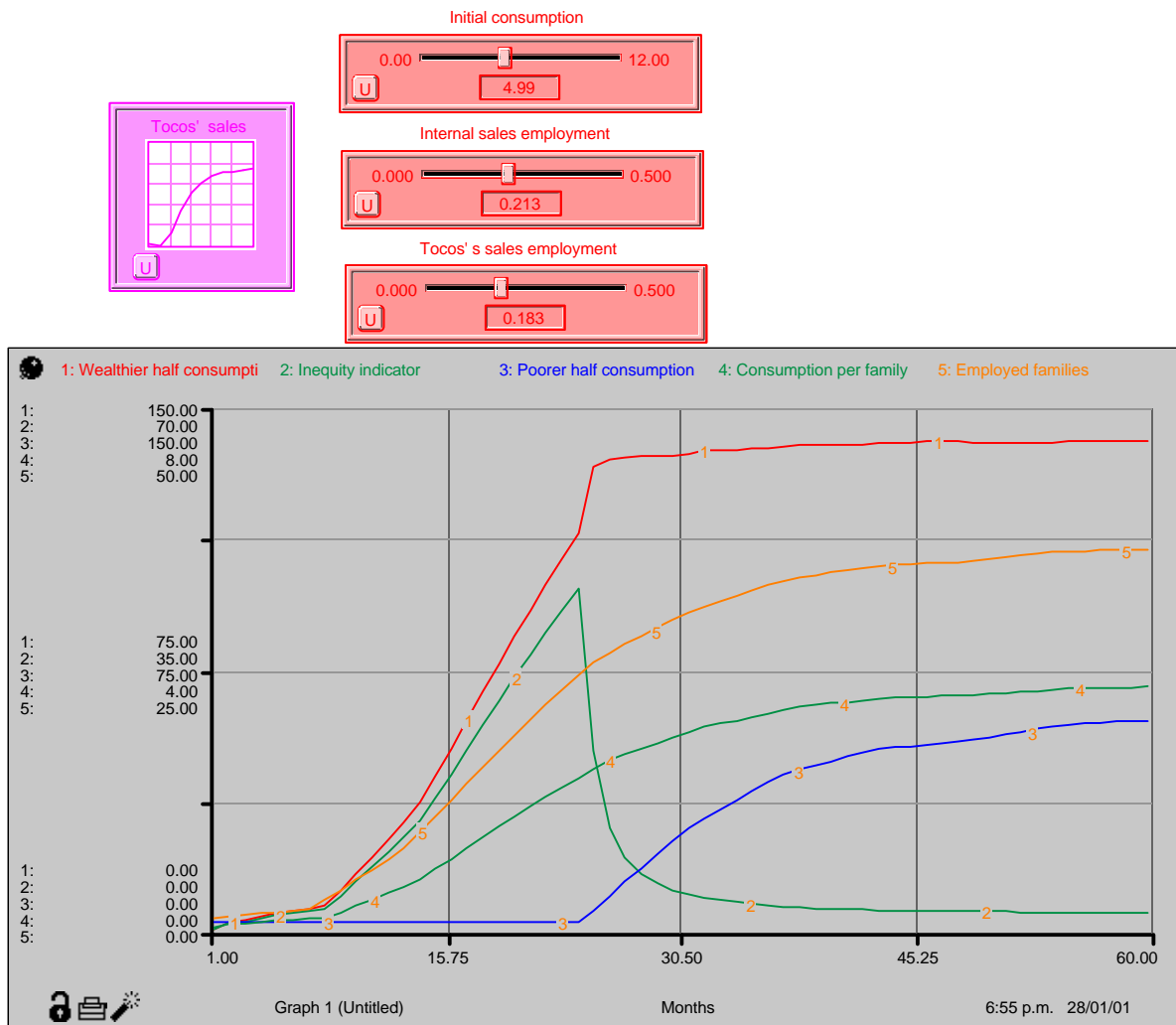


Figure 9. Social construction scenario

Social rejection scenario

Community in general, and Pablo's family in particular, rejects the incipient experience. Pablo migrates to other town and establishes his production with Arturo's support. Figure 10 illustrates the evolution of community in time, which appears stopped.

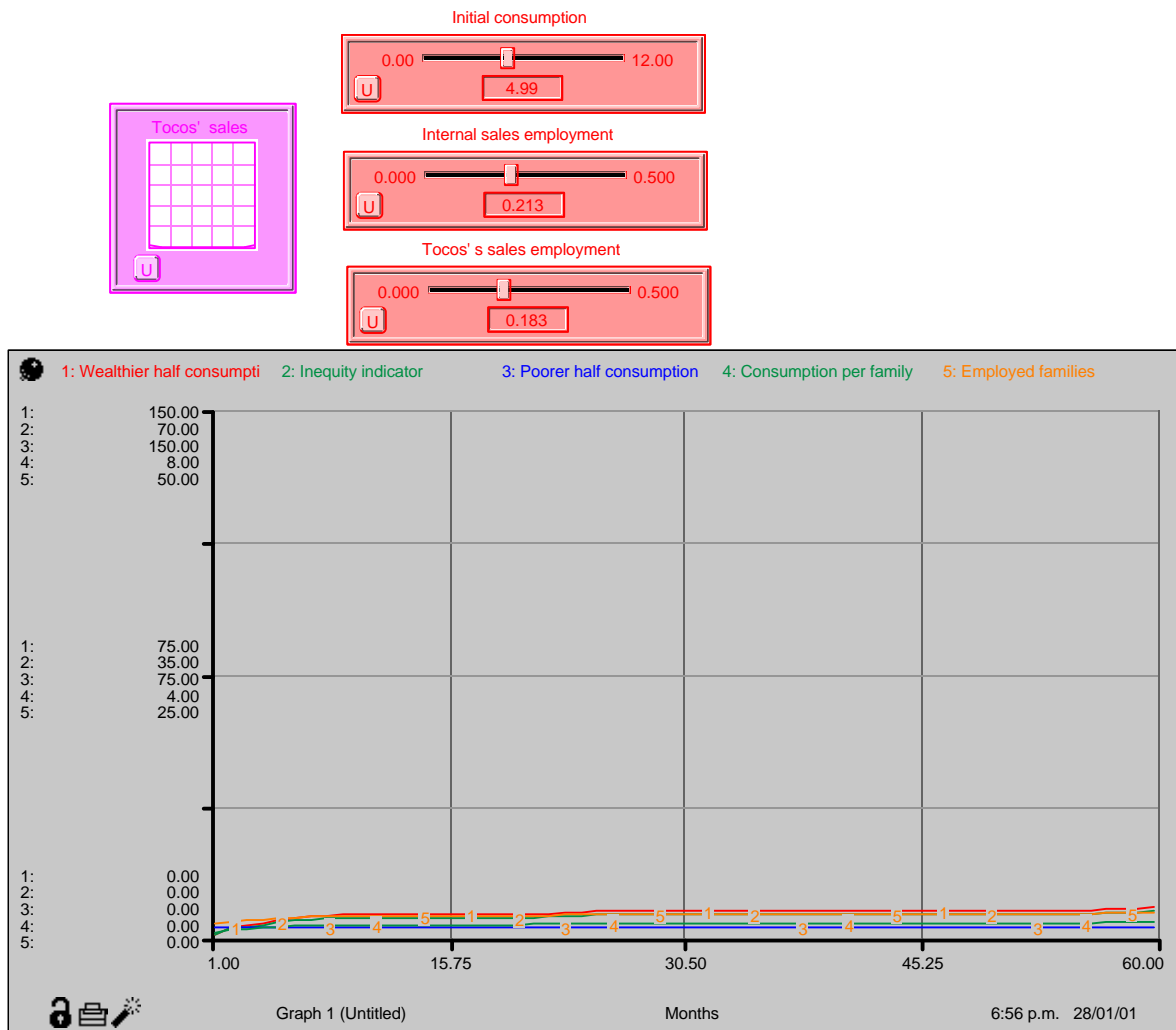


Figure 10. Social rejection scenario

7. Conclusions

The proposed exercise is helpful to develop conversation open to different discourses and positions. At the same time, it establishes a basis for elaborating common constructions. Although its objective is not to obtain a consensus, it favors the creation of shared interpretation and diagnosis.

During the exercise, we took pains in the explanation of diagrams, in order to allow the comprehension of public non-familiarized with dynamic systems software. An important element is the understanding of welfare as a process of continuous flow of generation and consumption.

State is deliberately not considered in the metaphor. That is the best way we found to include it in the discussion. One of the reflections we want to propitiate is about the necessity of state and the role of each individual in his welfare.

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