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## Gaming for the management of sustainable policies

**1. Why games?** Games and gaming-simulations have proved to be an excellent learning and communication tool: they can be used as a vector of knowledge about real and complex systems, and also as a vector of skills and values. Games may even be used as contexts for negotiation and as means for revealing personal systems of preferences.

A game is «a pleasant activity in itself, it does not require any further objective beyond that», writes Kant in *The Critique of Judgement*. It is a fully convincing argument. But that does not suffice, for what if the definition provides only necessary but not all the sufficient criteria? Each of us can recall activities «pleasant in themselves» different from games: numerous and different with respect to ideologies, experiences, ideas of the world, individual fantasies and perversions. We need to extend the definition: a «game» is a pleasant activity that has no other aim than itself; it is subjected to rules, but chosen freely; it takes place in a simulated world, and proposes victory as its main objective.

Clearly therefore, educational games, communication games, participation games *per se* do not exist. A game is a game, and as such must maintain the peculiar trait of «autonomy of objectives» that any game must have.

Another issue is whether or not games can contribute to education, communication or stimulation or support of participatory processes. The answer here is affirmative: for example, one could indeed use a game to communicate something, but that game would still need to be a *real* game, not a fake, and its primary objective would be to create a world, an environment, a behaviour, developing the taste for pleasure and, with it and within it, curiosity, courage, competitive spirit, co-operation, determination, letting even cruelty appear, if necessary.

Only then would a game operate in that peculiar indirect but effective manner, as a game.

**2. Few Examples.** We have designed and developed several games dealing with urban, planning and environmental issues in the past.

Let us start with a couple of simple games used for two exhibitions on urban sprawl (see Font et al. 2004 and Indovina 2005) [1]. If one looks at them, their simplicity is easily noted; if one plays them, their «usefulness» is rapidly appreciated.

The first game «Urban Animal» is actually no more than an amusing structured questionnaire, with «only» purpose of bringing citizens closer to the themes and issues of urban life: the resulting profile of the player («which urban animal are you?») might constitute an opportunity to reflect upon the multidimensionality of the contemporary city.

The second game, called «Future Cities» has a twofold function: on the one hand to present a set of urban projects proposed for a specific urban area (Barcelona and Bologna in our cases), and on the other to exhibit the idea of interdependency between various projects in making a desirable future scenario possible. The player has a defined amount of available resources, and after picking his/her «desired» future scenario, s/he needs to put together actions («implementing» projects each having a cost) s/he believes useful for achieving that specific scenario; a simple simulation model says if the operation was successful or not.

These two games are actually generalised game engines that can easily be adapted and modified simply by substituting the files with questions, profiles, projects, scenarios and multimedia content [2].

Another interesting experiment was the Como Mobility «GioCoMo» game. It is a game for supporting public participation in metropolitan transportation planning of the city of Como. The Municipality of Como commissioned to the Milan Polytechnic University to research the feasibility and possible alternatives of a tram-based transport system (see Colorni

et al. 2003) [3], for which our Laboratory had the task of creating, designing and developing a system for interactive communication oriented towards the public consultation and the participation of citizens. The Web-based game GioCoMo was a part of this system. For more details on the game see Blecic & Cecchini 2002 [4].

Another interesting example is the «Piazza Catalana» project, originally designed to promote the Catalan language in Alghero (Sardinia). The project's infrastructure is grounded on an Internet-based 3D multi-user environment. Three environments (virtual worlds) have been designed with this system: a realistic 3D reconstruction of the present-day historic town core of Alghero, a historical reconstruction of Alghero at the beginning of the 16th century, and a future environment with no physical resemblance to the current town.

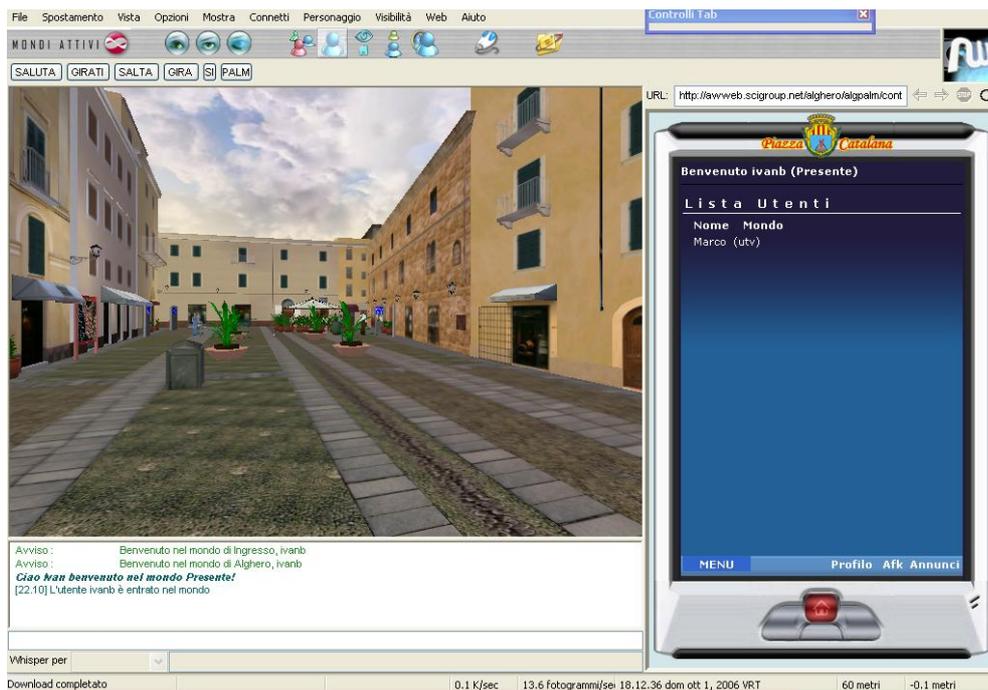


Figure 1. «Piazza Catalana»: a 3D reconstruction of present-day Alghero

Lots of interactive activities take place in the «Piazza Catalana» community, from games, to collective world building, to meetings and presentations, and much more. This infrastructure could easily become a virtual space for information, communication and participation in planning for the city of Alghero.

**3. Why a game about sustainability?** As mentioned before, the presented games have some interesting characteristics.

On the one hand they have the capability of coping with the multidimensionality and the interdependency of factors. On the other hand their nature of «games» makes them particularly user friendly and communicative. These features are the basic points of any educational programme about sustainability.

The study of complex phenomena and non-linear relationships that characterize sustainability approach often requires elaborate studies that can only be discussed within a scientific ambit. This is one of the most important paradoxes of many initiatives for sustainable development.

As many authors say, the changes required from sustainability first of all imply deep changes in cultural paradigms. The wide application of sustainable policies can only take place if the society asks for it. Any useful policy can be successful only with the cooperation of «common people» too.

The illusion that «environmental policies» will simply make the world better ignores the contradictions between different interest in society and different desirable worlds. Any environmental or social improvement requires an effort and implies positive as well as negative consequences in the society.

In this sense, the first and most important action towards sustainability is the effort in constructing a wide awareness of sustainable issues, their importance and cost. The challenge is then to explain complex phenomena to people, make them conscious of their action consequences, construct the reasons for a different way of life.

**4. The «SOS» Game.** The «SOS» game, which is probably the most interesting game we have developed recently, is a multi-user Web-based game designed with the intent to communicate and transmit at least a part of the intrinsic complexity related to problems of government and policies related to sustainability.

In recent years, mainly due to the spreading of the Internet, many «video-games» have appeared – animated quizzes, pseudo-arcades or other genres – with the explicit objective of environmental education. Even if rich in multimedia content, many such games offer an over-simplified and naïve idea of the problems and issues involved. This flaw is particularly visible in the way individual «environmentally-friendly» behaviours are encouraged and sponsored, without explaining and exposing all the costs, potential conflicts, and all the psychological, economic and social difficulties the adoption of strongly environmentally-oriented behaviours and policies may imply. But above all, without communicating that a radically different government and use of environmental resources would require a remarkable political and *collective* effort and a systemic intervention, in comparison to which the sole issue of «good» individual behaviour has no more than a homeopathic function.

The game «SOS» is thus an attempt to provide «environmental education» by presenting two fundamental themes. On the one hand the game makes the player think about the relationship between the individual and society and the complex ways individual actions are interwoven with public policies.

On the other hand there's the matter of the scale: each action can have different consequences depending on the scale we analyze it. For this reason it is important to think about local, national, international and global scale in order to have a complete framework of an action effects.

In the game, the player takes the role of a «representative» citizen of a nation among other citizens/players, and has the possibility to undertake actions and decisions, both those regarding his/her individual behaviour, and those that bring about interaction and negotiation of policies with other players, influencing the social, economic and political order of their nation-states.

Before choosing the nation-state to live in, players must undertake a test which allows to determine their personal profile. This profile, measuring the players' propensity to save or consume (parsimony vs. dissipation), their level of local or global identity (local vs. cosmopolitan identity), as well as their wider political and cultural orientations and opinions, is used in the game, among other things, to calculate players' pay-offs of their action.

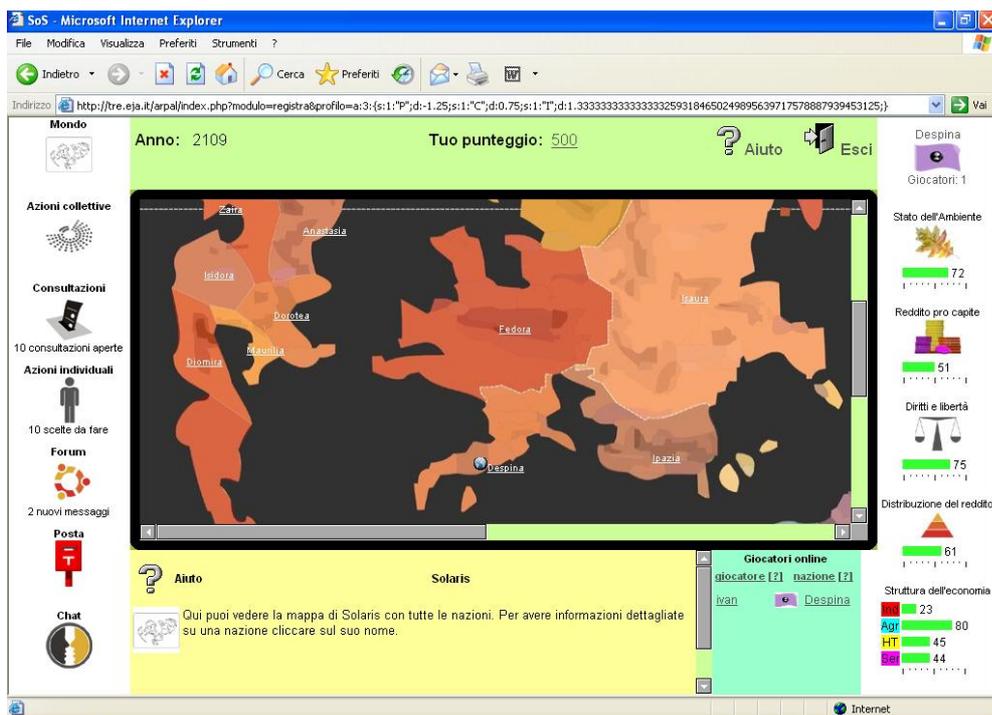


Figure 2. Main game interface

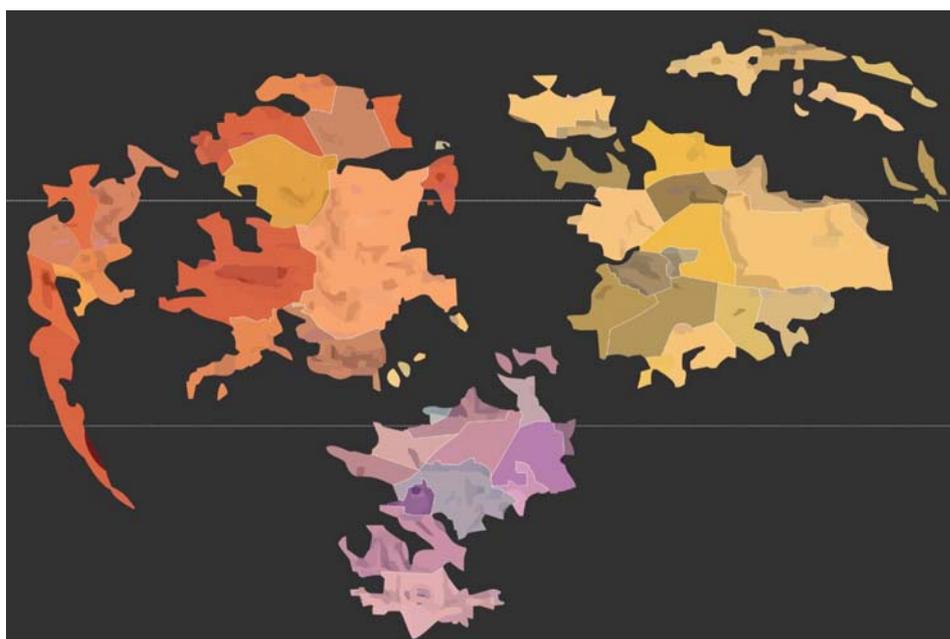


Figure 3. The «World» Map

The simulated imaginary world is quite a diverse place, as nation-states can be rich or poor, democracies or autocracies, tolerant or fundamentalist, with different economic structures, different ways of using environmental resources, and different ways of distributing wealth and offering opportunities to their population. Even if it is only an invented world, this is pretty much the picture of our real world today.

This is a fundamental aspect in order to make the citizen/player aware that sustainability strategies cannot be thought independently from socio-cultural context. Every culture and every nation has its own way to sustainability.

All nations are described by several indicators, which may vary from 0 to 100:

Table 1: National Indicators

Indicator	
State of the environment	
Freedom and political and human right	
Pro capite Gross National Product	
The distribution of wealth	
Structure of the economy (with economical sectors: agriculture, industry, traditional services and advanced & high-tech services)	

Clearly, the values of these indicators change with time as players make their decisions.

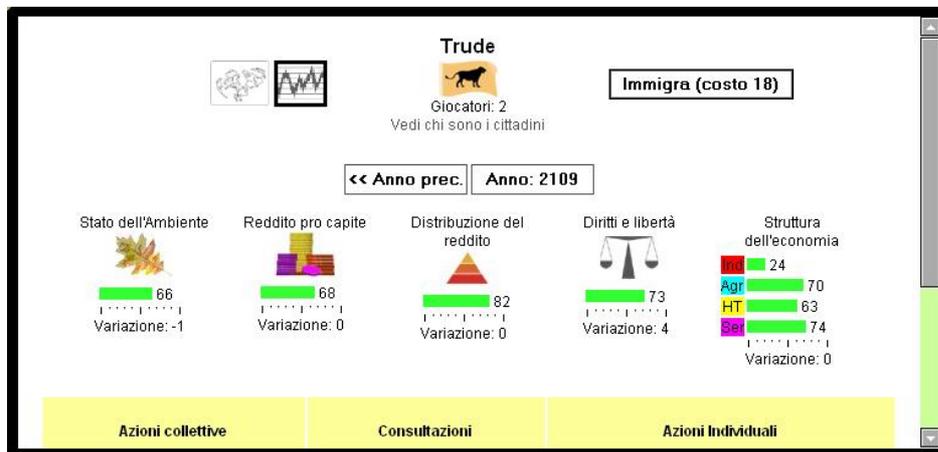


Figure 4. Nation status

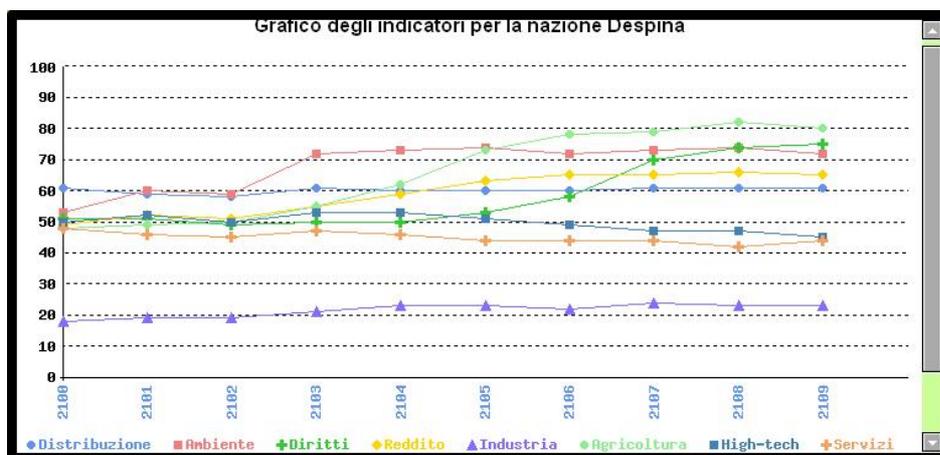


Figure 5. Evolution of nation parameters

SOS is a turn-based game, where each turn, representing a year in the life of the simulated world, lasts one solar day, for a total of 25 turns.

During each turn, players take decisions and choose options about their individual behaviour and decisions, express their opinion about general economic, political and social issues, and can jointly contribute in financing and activating public policies. The game offers tools for interaction among players: discussion forums, chat and internal messaging.

The underlying simulation model is trying to simulate the dynamics on an individual as well as on a societal level. On individual level, the decisions taken by a player related to his/her individual behaviour will determine his/her payoff measuring individual satisfaction. For example, the decision to use public rather than private transportation means may create different personal satisfaction, depending on the player's personal profile and on the state of the nation. On the other hand, all the decisions, be it related to individual players' behaviour or related to collective policies and decisions, have their impact on collective, national level. For example, a transition to a radically «clean» economy can be seen to have relevant economical, social and political impacts and costs.

This is precisely the reason why we decided to model a nation not exclusively through environmentally-centred parameters and indicators, but by including also all the other indicators mentioned above that are reciprocally interrelated in complex non-linear manner: to expose at least some of the complexity of interactions among different aspects and variables, to depict possible trade-offs and intrinsic difficulty related to decisions and, ultimately, to show that environmental policies may have specific costs and difficulties, and that not only individually-driven behaviours are sufficient for a different more sustainable economical models, but more general decisions and orientations have to be taken at collective political level.

**5. Conclusions.** To survive the development (or in the development, or against the development, or notwithstanding the development, or with the development) and to construct a sustainable society is a goal that imposes understanding and management of the complexity, both intrinsic to systems with many objects interacting in a non-linear manner, and due to the freedom of action of individuals.

This goal can be achieved by the construction of a new development model, where this deep understanding of the complex dynamics of our world makes all the actors, at any level, able to provide integrated solutions and to avoid externalities. This change of paradigm cannot be imposed from the top, but has to be built with all the society: for this reason the creation of a wide understanding of these themes is a key point for any progress towards a more sustainable world.

As mentioned before, in many cases environmental education tends to simplify problems and this can prejudice the usefulness of this activities. We are convinced that the examples of games, and especially the «SOS» game are useful contributions to the objective of designing and developing tools that do not tend to simplify reality, but rather try to entirely employ its complex nature, including the level of behaviours and general values.

**6. Acknowledgements.** We would like to thank Regional Agency for Environmental Protection of Liguria (ARPAL - Agenzia Regionale per la Protezione dell'Ambiente Ligure) for commissioning, financing and providing useful materials and data for the development of the «SOS» game.

### **References:**

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