

See this page also at <http://tinyurl.com/dl2mmb>.

## 2.1 Use of Global Gaming with Open Modeling Network:

The purpose of an interactive gaming mechanism is to help find appropriate alternative policies by establishing consensus among participating parties. It is suggested here that globally distributed computer simulation should be tested interactively with the game player inserting pseudo-policy parameters into the models whenever necessary, during the execution of simulation. This is called peace gaming/simulation (Utsumi, 1977) similar to war games practiced by military strategists (Schram et al., 1971). With the advent of global broadband Internet and standard interface protocols for interconnecting various dispersed, dissimilar host computers, the potential exists for ensuring the coordination of international efforts by providing more frequent communications and an environment for shared development, enabling more credible simulation study than was previously possible.

The GLObal Systems Analysis and Simulation (GLOSAS) Project proposes to utilize the semantic benefits of gaming simulation on a global scale to aid decision makers in appreciating the impact of their decisions on interwoven global problems, i.e., the construction of Globally Distributed Decision Support System (GDDSS) with Distributed Computer Simulation Systems (DCSS), which deals with coordination of the distributed sub-models and their experts via the global Internet for global crisis and ecology management for *plus sum, peace game*.

## 2.2 Globally Collaborative Environmental Peace Gaming (GCEPG) System

With global GRID computer networking technology and Beowulf mini-super computers of cluster computing technology, we plan to firstly construct globally distributed socio-economic-energy-environmental simulation system (GDSEEESS) with a hope that it would later be interlinked with globally distributed climate simulation system (GDCSS) in parallel fashion, both of which will be interconnected through broadband Internet in global scale (Fig. 2.1). This two-tier system will ensure comprehensive system for each by their experts. This is also because, strangely, there is currently a deep disciplinary division between climatologists and socio-economic-environmentalists preventing close dialogue and cooperation between them [van der Leeuw, S., (2007)].

Each Global University System (GUS) (which is an associated project – see below) of various countries will maintain the sub-models of their countries autonomously – along with construction and maintenance of its databases, modification of their sub-models, and supply of game players in cooperation with their overseas counterparts through the global Internet.

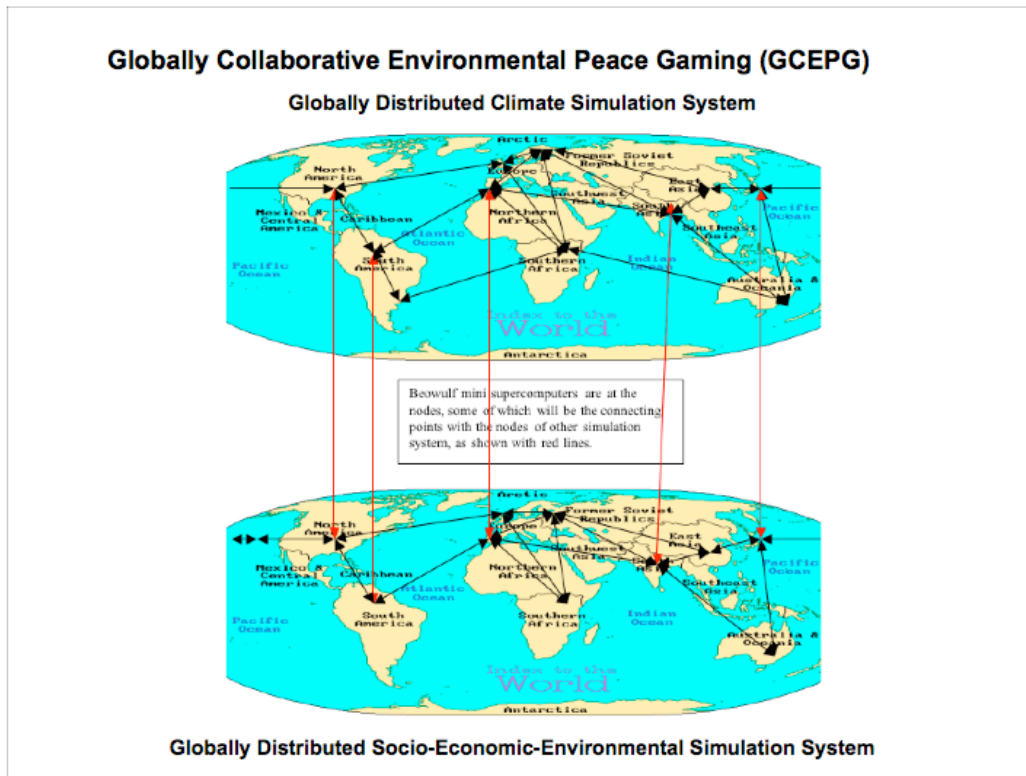


Fig. 2.1: Globally Collaborative Environmental Peace Gaming (GCEPG) System  
 < Globally Collaborative Environmental Peace Gaming (GCEPG)\_no background copy.pdf>  
 <<http://tinyurl.com/c3x6as>>

### 2.3 Principles of Gaming/Simulation:

- (a) Iron rule of simulation – “**Make simulation as close to simuland as possible,**”
- (b) Greyhound Bus’ Motto – “**Leave Driving to Us.**”

These principles of gaming/simulation necessitate division of functions to collaborative stakeholders and experts of their fields and countries who would be interconnected with a globally distributed simulation system with inevitable advantages and benefits (See Fig. 2.2).

#### Advantages of Distributed Simulation

1. Increase of **Credibility**
2. Data **Security**
3. **Flexibility**
  - a. Use of any language within local simulation
  - b. Same for methodology, machine, etc.
4. **Participatory Democracy** with Bottom-up Decision
5. **Cooperation** for Better Understanding
6. **Suitable for Large-scale, Confrontation-prone, Global problems**

Fig. 2.2: Advantages of Distributed Simulation  
 <Advantages of Distributed Simulation\_no background copy.pdf >  
 <<http://tinyurl.com/cny8zt>>

Based on the review of the past attempts and experiences with model acceptance and validation, meaningful and credible simulation has to be implemented as a modeling network composed of a large number of locally developed and verified models. No single model, developed by a local group of experts has a chance for universal acceptance when it deals with controversial and confrontation-prone area such as global resource allocation and economical policies.

## 2.4 Methodologies

Followings (but not limited) are major simulation methodologies we will use;

1. Dynamic Methodologies:
  - a. Econometrics
  - b. System Dynamics
2. Static Methodologies:
  - a. Input/Output Method
  - b. Linear Programming
3. Communication-oriented Methodologies:
  - a. Policy Delphi
  - b. Cross-Impact Matrix Analysis (Probabilistic System Dynamics)

## 2.5 Centers for Conflict Prevention, Management and Resolution (GCN/CCPMRs)

We will then create the **Globally Collaborative Network of the Centers for Conflict Prevention, Management and Resolution (GCN/CCPMRs) on Environmental Issues** at each GUS in various countries, which will be interconnected through broadband Internet for conducting the following two-tier system;

- a. This project with a globally distributed computer simulation system, focusing on the issue of environment and sustainable development in developing countries, will train local experts for leadership development, in relation to strategic use of technologies and cooperation among stakeholders for more effective advocacy, informed policy, public understanding and participation and concrete community development.

This project will also train young would-be decision makers for understanding interwoven world phenomena with rational analysis and critical thinking, and then in crisis management, conflict resolution, and negotiation techniques basing on "**facts and figures**" [Utsumi, 2003] and

- b. The other for helping decision makers constructing a globally distributed decision-support system for positive sum/win-win alternatives to conflict and war.

## 2.6 Project Management:

A sustainable solution can be found by an integrated approach of multidisciplinary qualitative and quantitative policy analysis of global interrelations and interdependencies among the involved countries and in discussion with all the integrated stakeholders.

This project will then demonstrate integrated and synergistic approach among grassroots, government, university, stakeholder, etc. Use of graphic info modeling/mapping and potential "gaming" on key issues and solutions will assist each group's ability for standardized data gathering and situational analyses, projecting out possible outcomes for more informed decision making and activities. It brings together most sophisticated university-based mathematical modelling techniques and social sciences skills of experts and

regular people who can then more easily see--at a glance--how issues and outcomes can impact and interact each other.

## 2.7 Plan of Actions:

With a series of workshops for this multi-lateral, multi-year project, we will devise asynchronous, interactive coordination of globally dispersed, dissimilar simulation models of socio-economic-energy-environmental system through broadband Internet as focusing on the sustainable development of participating countries. We will utilize the existing models as much as possible; otherwise, researchers will construct their country models. Those models will form a public Open Model Network (OMN), which would consist of models developed by local experts interconnected by global Internet (Utsumi, et al., 1986). The organization and management structures of the proposed GCN/CCPMRs with time and task schedules will also be formed, which will build fund raising plans for further development.

Our first milestone of this project is to make the GCN/CCPMRs as one of the Research and Training Center (RTC) programs of the United Nations University (UNU) with the collaborative efforts of the Earth Institute (EI) of Columbia University, Millennium Institute (MI), New York University/Polytechnic Institute (NYU/PI), International Communication of Negotiation with Simulation (ICONS) of the University of Maryland, GLOSAS/USA, and Global University System (GUS)/UNESCO/UNITWIN Networking Chair Program at the University of Tampere, Finland, etc.

If accepted, as the mandate of the UN/RTC, this project will help decision-makers at the various agencies of the United Nations. Each RTC in various countries will also;

- (a) Emulate environmental education activities of the EI,
- (b) Emulate modeling activities of the MI,
- (c) Emulate ICONS of the University of Maryland,
- (d) Collaborate with GLOSAS/USA along GUS.

It may be wise to select countries for inviting and joining into this GCN/CCPMR project, e.g., Russia/Siberia, China, Japan, European, Asian and African countries, etc., through the UNU/RTC program. See participating organizations and individuals (tentative) in <<http://tinyurl.com/65wrk7>>. Participants will be connected through Internet via text, audio-, and video-conferencings.

## References:

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