PARTICIPATORY RESEARCH & ICT IN VENICE

De Marchi, Bruna[1]

Gough, Clair[2]

Guimarães Pereira, Ângela[2]

Abstract: A number of In-depth groups have been conducted in Venice, as part of an EC funded project called ULYSSES (Urban Lifestyles, Sustainability and Integrated Environmental Assessment). The issues of urban lifestyles and sustainability, particularly in relation to climate change, formed the focus of discussion The use of Information and Communication Technology (ICT) was explored during the sessions. Within the In-depth Groups scientific models were used to illustrate the contribution of individual lifestyles to a global phenomenon using the sets of increasing scales and more inclusive scopes. Hence, the conditions to create contexts of interaction with ICT were explored in order to examine: (1) how technology can influence public awareness, by enhancing, hindering or modifying it; (2) how people relate to ICT in general and in particular to specific climate models; (3) how people can suggest adaptations or modifications of ICT in order to improve its effectiveness for their purposes. This paper focus on the preparation of the technical material presented during the sessions, indicating some relevant reactions of the participants towards the use of ICT in participatory contexts, including the influence of such tools into group dynamic and processes.

1. Introduction

This research was carried within the context of an EC funded project called ULYSSES[3]   (Urban Lifestyles, Sustainability and Integrated Environmental Assessment) that involved the use of ICT tools in similar groups in seven European cities (Athens, Barcelona, Darmstadt, Manchester, Stockholm, Venice and Zurich). The broader concern of the ULYSSES project relates to the integration of computer models as part of an advanced IEA methodology. The issues of urban lifestyles and sustainability, particularly in relation to climate change, formed the focus of discussion. Further information about the ULYSSES project and the other research locations is available[4] (De Marchi, Funtowicz et al., 1998; De Marchi, Funtowicz et

---

[1] Institute of International Sociology of Gorizia (ISIG)

Via Mazzini, 13

34170 Gorizia ITALY

isig@univ.trieste.it

[2] Joint Research Centre – EC

Institute for Systems Informatics and Safety (ISIS) – TP 650

21020 Ispra (VA) ITALY

clair.gough@jrc.it & angela.pereira@jrc.it

[3]   Shared Cost Action 4th Framework program on Human Dimensions of Environmental Change (ENV4-CT96-0212)

[4] http://ta-www.jrc.it/frontpage.html; http://zit1.zit.tu-darmstadt.de/ulysses/

al., 1997); the present paper is concerned with the ULYSSES groups held in Venice and specifically considers the use of ICT by those groups.

In the second section of this part we summarise the participatory research design, where we specify the whole *plot* of this experience. The third part of this paper reports on preparation and presentation of technical material and models presented during the sessions. The fourth part summarises our major findings in relation to the research objectives, the research tools and models, and the facilitation process.

2. Participatory Research: In-depth Groups Design

A series of In-depth Groups (I.G.s), divided into two rounds were planned, prepared and conducted in the Venice region of Italy. Six groups of nine people each met for 5 sessions over a total of seven weeks (the first four I.G.s spanned five weeks and the last two spanned two weeks).

The format of an In-depth Group (for example, see (Burgess, Limb et al., 1988; Burgess, Limb et al., 1988; Harrison, Burgess et al., 1996)) was chosen to allow a thorough discussion of the complex issues of lifestyles, sustainability and climate change and to allow time for the participants to have hands-on access to computer tools.

In the remaining of this section we report the objectives that guided our exploration and account for the research design which we conceived within the frame of the ULYSSES project. Subsequently, we introduce information about: (1) the logistics, resources and the staff; (2) the recruitment of the participants and the contract terms; (3) the meeting agenda.

2.1 Research Design

We chose to describe our work in a strongly metaphorical way. Being involved in a metaphorical situation catalyses the development of relations among participants, who quickly and easily start interacting with one another, while they are fully engaged in a pleasant activity.

The metaphorical context was presented as an *"Odyssey, a voyage in which at least three territories are explored:*

- *information and communication technology*
- *lifestyles and regional futures*
- *extreme events and climate change*

During the journey there is some discussion about these areas while visiting and observing them. The participants travel as a group. With them, there would be a special passenger who is named Mr. COMPUTER. Computer needs special attention and special care because it cannot communicate without aid. Therefore it requires a human companion in order to participate in the voyage, to interact with other travellers and to provide its own contribution to the exploration. Two more companions are on the journey, providing guidance and tips in case the participants need them or get lost along the way.

As in every voyage there is the need to register the best impressions in order to share and remember the experience. That is why there is a video camera. Moreover, the participants report their most relevant experiences and impressions in a logbook."

2.2 Research Objectives

The following objectives guided our research and discussion within the I.G.s They are derived from those stated in the ULYSSES Work Programme and have been translated into multi-level operational goals:

(1) To create contexts for facilitating public awareness of: environmental and social issues, empowerment and responsibilities regarding issues that are remote or even not yet known;

(2) To create contexts of interaction with information and communication technologies (ICT) in order to examine, among others how technology can influence public awareness, by enhancing, hindering or modifying it; and

(3) To evaluate group process, self-representation and the experience of research done on the basis of qualitative, interactive group work compared to other modes.

2.3 Resources

Meetings were held at the *Parco Scientifico Tecnologico* located in Porto Marghera, the industrial site on the main land, just across from the historic centre. By chance, our room, at the top floor of the building, had some resemblance to a ship with its round windows. Technical equipment comprised a video camera, two portable computers, two computer screens and a LCD display. Flip charts hanging on the walls were used to write up the Logbook.

Tools

The Logbook and the video camera were the tools by which we recorded the experience: the former from the perspective of an outside observer, the latter from the protagonists' perspective. Our notes were also tools to integrate the observation from a research perspective. The computer screens, the overhead projector and the LCD were the tools to convey the information about the content.

Models

We chose to present IMAGE or TARGETS as global model, along with an in-house made personal CO_2 accounting model built with STELLA™ (HPS, 1997), a dynamic modelling environment. The first two models were part of the model portfolio available for the ULYSSES project, the last one being the missing piece of our logical sequence of presenting the problematique: from an individual perspective through a global one.

The Staff

The staff involved in the research comprised three professionals with different backgrounds, skills and competencies: a sociologist, a psychologist and an environmental engineer. The first two have experience in fieldwork, team leading and communication, whereas the third has experience in modelling, environmental issues and information technologies. The variety of professional backgrounds was selected in order to cover the different aspects of the task to be performed by the group, both in technical and relational terms.

2.4 Composition of the In-depth Groups

On the first round of I.G.s we had 4 groups, whereas on the second round we had 2 groups, each of which had on average 9 people. On the first round, with respect to criteria 1, 2, and 4, the groups were evenly balanced, as expected. With respect to the profession, the first groups showed a prevalence of "white collar workers" and very few manual workers, if any. Most participants of the first round of I.G.s had a rather high level of education and came from prosperous households. Hence, on the second round of I.G.s we added a further criterion (education) to those previously assigned (sex, age, occupation, and place of residence). We specified that the participants should have a maximum of 12 years' education (possibly less). This skew towards low levels of the social ladder was sought in order to balance the opposite tendency that prevailed in the previous groups.

2.5 Agenda of the sessions

Five meetings were scheduled for each of the six I.G.s. Each session lasted a maximum of two and half-hours in order to accomplish the tasks assigned for that session. The research team envisioned the following structure for each session in each group:

a. warming up welcome;
b. introduction to the session topic;
c. group discussion guided or monitored by the facilitators;
d. break;
e. free group discussion and summary, through the writing of the Logbook.

The structure was designed to be firm in terms of sequence and rather flexible in terms of time allocation to each part, within the fixed time span of two and a half-hours. Such flexibility was applied also when planning the presence of the staff in phase e. The preferred option was of the group working on its own, in order to favour personal involvement and minimise dependency from the "experts".

3. Information and Communication Technology

3.1 Preparation of Models

The team has prepared the technical and modelling information to be presented to the participants of the In-depth Groups, covering information about the climate change *problematique*, including the greenhouse effect and its possible effects; an individual account for lifestyles in terms of transportation and energy - a personal CO_2 calculator - and the preparation respectively of scenarios and views from the integrated assessment models IMAGE (Alcamo, 1994) and TARGETS (Asselt and Rotmans, 1996; Rotmans and Vries, 1997).

This section briefly catalogues the experience of setting up the models for ULYSSES. We feel that there is much to be learnt from this experience that could benefit future similar applications.

The use of models with the I.G.s raised some discussion and eventually a "models group" was created amongst the ULYSSES partners which, through email exchanges, proved very constructive step. After a very *ad hoc* start to its co-ordination, this group developed into a strong collaborative and supportive network about the two global models IMAGE and TARGETS. It has proved highly effective, in particular for sharing experience and support regarding the many technical and practical challenges associated with presenting these models to I.G.s.

3.2 Presentation of the Technical Material

The Greenhouse Effect and Climate Change

An animated presentation of the greenhouse effect was prepared, covering: explanation of the phenomena and hypotheses on causes; relation with possible manifestations of climate change; policy issues; international treaties & efforts; IPCC etc. Participants were thus introduced to the complexity, multi-dimensionality and uncertainty of the issues.

CO_2 Personal Calculator

We have developed a quantitative dynamic tool to assess personal CO_2 emissions, with regards to the use of energy, both in the home and for transportation. It consists of an account of the yearly carbon dioxide emissions derived from people's consumption of electricity and transportation fuel.

The IMAGE 2.0 Model

IMAGE 2 (Integrated Model to Assess the Greenhouse Effect), is a global scale Integrated Assessment Model that calculates potential causes and impacts of climate change up to the year 2100. It was developed at RIVM in the Netherlands (Alcamo, 1994; Alcamo and Kreileman, 1996; Alcamo, Kreileman et al., 1996) and was one of the models available within the ULYSSES project**.** It was used in the groups to initiate discussions on climate change as a global issue.

The elements of the IMAGE model were prepared, i.e. model components, basic mechanisms and assumptions, input and output of the model and its basic scientific and political objectives. The participants are able to explore the model by accessing scenarios through a web interface prepared by Christoph Schlumpf[5]. This introduces the opportunity to explore the INTERNET, and its resourceful means of accessing worldwide information on issues such as the one being discussed in the I.G. sessions.

The TARGETS Model

TARGETS (Tool for Analysing Regional and Global Environmental and health Targets for Sustainability) (Rotmans, Asselt et al., 1994; Rotmans and Vries, 1997) is the second global Integrated Assessment Model that was used here as an alternative to IMAGE 2. TARGETS attempts to integrate the study of climate change with other major environment and development problems. Anthropogenic disturbances of the biosphere are modelled by a set of inter-related cause-effect chains. These are represented in a series of sub-models describing: Global Population and Health;

---

[5] Christoph Schlumpf is with the ULYSSES Zurich team and has carried out several tasks for ULYSSES project namely a personal CO_2 calculator used in focus groups carried out in that town (see (Schlumpf C., Behringer J. et al., 1998)

Global Energy; Global Water ("AQUA"); Global Land ("TERRA"); Global Flows ("CYCLES") each of which is described in terms of its Pressures (driving forces), State (changes in the physical, chemical and biological state of the biosphere), Impacts (the effects of human interventions on the biosphere) and Response (societal and ecological responses). The elements of the TARGETS model were prepared, i.e. model components, meaning and illustration of perspectives, input and output data, basic mechanisms and assumptions. We had a specific profile prepared for us according to our requirements, translated into Italian for presentation to the I.G.s.

Information through the WWW

Through the World Wide Web (WWW) two aspects of ICT were illustrated: first, the extended means of gathering information about the issues relevant to the problematique under discussion (using a search engine with related keywords) and second, the possibility of diffusion of information by other lay citizens that have access to a computer connected to the INTERNET. Participants produced a wall Logbook that was edited as an HTML document, including all the material they have produced[6]. In this way, people could see how the information that they had produced could be disseminated throughout a powerful IC technology.

4. The Venice Experience

4.1 Summary of In-depth Group Reactions

4.1.1 Observations in Relation to the Research Objectives

In this section, we report our preliminary major findings. Here we have tried to relate some initial observations to the original research objectives, detailed in section 2.1.2, illustrating where possible with quotations from the logbooks. In (De Marchi, Funtowicz *et al.*, 1998) translated quotations from the I.G.s illustrate these observations.

In relation to *creating contexts to facilitate awareness*, we found that:

1) Group contexts facilitate the approach of *social and environmental issues*: it is indeed group dynamics, which promote the development of both individual and group awareness through exchanging, comparing, contrasting and sharing of knowledge and opinions. This develops through time together with the relationships between participants:

2) Regarding *personal empowerment* (given the general framing of In-depth Group research) participants tend to delegate policy decisions.

3) Empowerment is impaired by stereotypes about *politicians* who are viewed as self-centred, pseudo-democratic only mildly interested in ecological issues. The common impression is that politicians disregard citizens' opinions about those issues anyway.

---

[6] Available at http://ta-www.jrc.it/frontpage.html

4) *responsibilities regarding potentially unknown or remote issues:* participants have acquired through these types of interaction a growing sense of their personal contribution to environmental problems – at times with astonishment.

Regarding *creating contexts of interaction with information and communication technologies (ICT)*, the following has been found:

1) ICT is appreciated only if it is fully operational; therefore all technical details should be rehearsed on site before the sessions take place.

2) There were a variety of reactions according to previous experience with this type of technology: from those who knew the finer details of computer tools and those who had never seen a computer at work before this experience. As a matter of fact, people that were more familiar with these types of technologies were also more willing and active when using them.

3) ICT facilitates the development of awareness providing visualisation of data, trends and connections otherwise difficult to imagine. This contributes to building concrete representations of abstract concepts and ideas:

4) ICT *per se* was not perceived as exhaustive for presenting such complex issues, rather as a complement to the interaction between facilitators and participants. The role of the facilitators has been stressed as fundamental in relation to ICT.

Regarding *evaluation*, our preliminary findings were:

1) People generally tend to stabilise on *consensus*, even when opinions are divergent to begin with.

2) *Integration of ideas and opinions* (complementing one another within an enriched vision of the problematique) seems too much of an ambitious goal to be reached in just five sessions of two and half-hours.

3) *Juxtaposition of opinions* occurs when strong opinions and strong personalities are combined.

4) Relational dimension seems to exceed the 'task' dimension in most cases.

5) *The group representation as an expression of a common space* is not reached within such a short common experience. Yet, an incremental usage of 'we' as referring to humanity was observed.

6) *Group research experience* was perceived by the participants as rewarding, entertaining, enriching, stimulating, thought provoking and such a learning experience that was labelled by some as a 'course'. The first seed of a micro-cosmos of social learning!

4.1.2 Preliminary Findings in Relation to the Computer Tools

Despite differing levels of education, participants of the first four groups were generally more highly educated than those of the last two, the factor that made the greatest difference with regards to computer technology was age. It seemed that the older people who had not had previous access to this type of technology were less willing and less curious to try it, regardless of the simplicity of the applications showed to the groups. The general feeling was also one of suspicion. In the remainder of this section we will summarise the reactions to the specific computer tools

presented and used during the sessions. In (De Marchi, Funtowicz et al., 1998) translated quotations from the I.G.s illustrate these observations.

About the CO₂ Calculator

Amongst the models presented, the one that referred closely to daily experience was more appreciated and stimulated more active participation.

About IMAGE 2

The IMAGE 2 model presented to three groups but, although the results promoted discussion, people were not particularly impressed with the results. For instance, the display of IMAGE 2 results through maps can lead to frustration – it is very attractive to consider such results in relation to their geographical distribution, however the resolution of IMAGE is so coarse as to hold little meaning to the citizen groups. On several occasions people were looking for a better definition of what is happening in Italy and were very interested in these types of results for their region. Moreover, people had difficulties in relating the results of this model with their own lifestyles. In fact, while exploring the IMAGE scenarios they did not relate the possible futures to their current choices for energy consumption and transportation modes. Moreover, the time span over which the scenarios are proposed did not seem to alarm them.

Also despite the fact that these scenarios are hypothetical many participants enjoyed seeing them (being at times quite impressed), believing that they are means of awareness and visualisation for what is usually just 'verbalised'. However, people were concerned with the reliability of the model and often suggest that the credibility of IMAGE scenarios could be improved by making a simulation for the year of 1997 to compare with real data.

About TARGETS

TARGETS has an extremely simple graphical user interface (GUI) , but its interface to complexity and uncertainties require a great effort to explain and to comprehend. For instance, people tended to understand perspectives (from cultural theory, (Thompson, Ellis et al., 1990)) not as addressing uncertainty but as addressing behaviour towards natural and human systems. Based on our experience, TARGETS is difficult to use as an exploratory tool in the context of a lay audience. People did not find it particularly helpful and did not appreciate why the information it gave was useful. For example, the result that under the assumptions of an individualist perspective a lower rise in sea level is expected than under an egalitarian perspective simply yielded a "so what" reaction. In such instances it can be the job of the moderator to attempt to explain "so what", but not at the expense of diverting the discussion away from the main topic towards a justification of a particular model. These reactions are well documented through both the video recording made during the sessions and also in the wall Logbook.

Finally, as with IMAGE 2, people showed the need to have tangible elements that can help them to get closer to the *problematique*.

About the WWW Homepage Version of the Logbook

From the wall Logbook we have prepared web pages that were then presented to the I.G.s. In all I.G.s people showed a great interest in having their own comments available to a wider audience such as that of the WWW. They were very happy with the fact that their work could be seen by the other research groups of the ULYSSES project.

5. Main Conclusions

5.1 Information Technology for In-depth Groups

One of our aims was to investigate the role and applicability of ICT in I.G.s and hence whether a particular ICT successfully supports discussions and not whether it is *possible* to use a particular ICT. It should not be the model itself that becomes the focus of discussion since a successful ICT should be merely a useful tool and not an end in itself.

The models experience from the I.G.s in Venice about Climate Change and Lifestyles shows that these ICT can be useful for the following:

- Illustration of **environmental and social issues**, as well as variables' links
- Demonstrating different **dimensions & perspectives** of the problematique
- Revealing different scales and **propagation effects**
- Promoting **awareness & responsibility**
- As an information source: **learning tools**
- Providing grounds for **personal decisional power**
- Stimulating discussions & suggestions

In contrast this experience demonstrates the areas of uselessness of these models:

- Adding confusion
- Distracting from the discussion
- Causing rejection or suspicion (if they seem irrelevant, 'flabbergasting' or unrealistic, remote from one's immediate "reality/everyday life(style)")
- an impersonal 'touch'.

5.2 Preliminary Analysis

5.2.1 ICT & People

Finally, we the research team, found this experience to be very positive and stimulating; the material collected has proved to be fascinating. We have concentrated on process rather than product because we maintain that it is the *interaction* of social groups and science-based technology that matters in the context of current participatory research.

Moreover, although models were used, the stress is on ICT in general. For this reason we used the WWW framework to produce a multi-media HomePage for each of the groups with participants' contributions collected in the form of a "voyage journal".

5.2.2 Contents

In terms of contents, the following key findings can describe our preliminary impressions:

- discussion and "acceptance" of uncertainty (in conceptual and practical terms)
- "competent" observations and questions
- focus on personal experiences
- regional dimension lacking, should be provided
- discovery also for researchers (serendipity)
- personal idiosyncrasies (researchers and participants)
- unintended and unexpected positive effects of mistakes
- technology mediated by humans
- technological resistance won through mutual aid
- some "irreducibles" - anti-computers (age variable is relevant)
- a lot of good research
- a lot of learning
- a lot of fun

5.2.3 The Facilitation Process

During the first session of each I.G. a major effort was devoted to creating a social context in which people could express themselves freely in a non-judgemental atmosphere, the metaphor created exactly for that purpose. It was particularly useful to focus participants onto the goals of the project, clarifying the context in which it took place and defining the various roles.

Hence, facilitators were mainly involved in:
- Introducing each session 'problematique';
- Focusing discussions & moderating interventions;
- Backtracking;
- Re-framing the meaning of interventions;
- Monitoring states of alertness of participants;
- Stimulating involvement in discussion and activities;
- Providing and encouraging feedback.

FINALLY…

Through the work carried out with the In-depth groups set in Venice, we have explored ways of improving and supporting the involvement of citizens in IA framework. We have found that lay people were able to engage with complicated computer tools, given certain conditions. The suggestions and reactions towards the IA models (IAM) used by our groups are not unique to lay users; required features and complaints are balanced by suggestions by other audiences for the improvement of IAM (see for instance ([Shackley, 1998 #23]).

Acknowledgements

the project. We would also like to acknowledge the participants of the I.G.s who gave their time and enthusiasm to accomplish the tasks proposed during the sessions.

References & Publications

Alcamo, J., Ed. (1994). IMAGE 2.0 Integrated Modelling of Global Climate Change . Dordrecht, Kluwer Academic Publishers.

Alcamo, J. and E. Kreileman (1996). "Emission scenarios and global climate protection." Global Environmental Change **6**(4): 305-334.

Alcamo, J., G. J. J. Kreileman, et al. (1996). "Baseline Scenarios of Global Environmental Change." Global Environmental Change **6**(4): 261-303.

Asselt, M. B. A. v. and J. Rotmans (1996). "Uncertainty in Perspective." Global Environmental Change **6**(2): 121-158.

Burgess, J., M. Limb, et al. (1988). "Exploring Environmental Values Through the Medium of Small Groups - 1: Theory and Practice." Environment and Planning A **20**: 309-326.

Burgess, J., M. Limb, et al. (1988). "Exploring Environmental Values Through the Medium of Small Groups - 2:Illustrations of a Group at Work." Environment and Planning A **20**: 457-476.

De Marchi, B., S. Funtowicz, C. Gough, Â. Guimarães Pereira & E. Rota (1997). **The ULYSSES Voyage**. http://ta-www.jrc.it/frontpage.html

De Marchi, B., S. Funtowicz, C. Gough, Â. Guimarães Pereira & E. Rota (1998). **The ULYSSES Voyage: The ULYSSES project at JRC**. ISPRA: Joint Research Centre - European Commission. EUR 17760EN.

Guimarães Pereira, Ângela, Clair Gough & Bruna De Marchi (1998) "**Computers, Citizens and Climate Change – The Art of Communicating Technical Issues**". *Submitted to IJEP*.

Harrison, C., J. Burgess, et al. (1996). "Rationalising environmental responsibilities. A comparison of lay publics in the UK and the Netherlands." Global Environmental Change **6**(3): 215-234.

HPS, I. (1997). STELLA.

Rotmans, J., M. B. A. v. Asselt, et al. (1994). Global Change and Sustainable Development: a modelling perspective for the next decade. Bilthoven, National I nstitute of Public Health and Environmental Protection (RIVM).

Rotmans, J. and B. d. Vries, Eds. (1997). Perspectives on Global Change, The Targets Approach . Cambridge, Cambridge University Press.

Shackley, S., J. Risbey, et al. (1998). "Integrated Assessment and the Strange Disappearance of the Politics of Climate Change." Energy and Environment **forthcoming**.

Schlumpf C., Behringer J., et al. (1998). "The personal CO2-Calculator: A modelling tool for a participatory integrated assessment environment." Environmental Modelling & Assessment **In press**.

Thompson, M., R. Ellis, et al. (1990). <u>Cultural Theory</u>. Boulder, USA, Westview Press.