ABSTRACT

Scenarios are powerful tools for stimulating creative thinking about the future. Scenarios are especially valuable for planning and decision-making in complex and uncertain circumstances. This paper presents how Scenarios and Visioning are useful tools for environmental education, in particularly for changing environments (social and biophysical). We first outline the Scenarios methodology. We then present lessons learnt from applying Scenarios to environmental education with children and youth in Peru. We conclude with an analysis of the benefits and challenges of using scenarios for environmental education to accomplish environmental awareness objectives.

Keywords: Scenarios; Visioning; environmental education; children; youth; environmental awareness
INTRODUCTION

The magnitude and location of environmental changes, such as the effect of climate change on particular regions of the world, or exactly how much sea level will rise, remains in many cases uncertain (Schiermeier, 2007). UNESCO (2002) recognized the importance of building the capacity for futures-oriented thinking as a key task of education.

Scenarios are creative answers to the question: “What if…?” in the form of narratives about the future. These stories consider a range of changes (expected or unexpected) that may occur and their potential impacts and follow a consistent and realistic logical framework. Scenarios can also take the form of technical models, maps, or theatre. Scenarios are particularly valuable for planning and decision-making in complex and uncertain circumstances and in situations where changes are occurring beyond the control of a community (Evans et al., 2006). The outputs of Scenarios can be quantitative, qualitative, or some mixture of the two (Alcamo, 2001). By stimulating creative ways of future-oriented thinking, scenarios help in making decisions today.

Other techniques can be used with Scenarios that guide communities to think about their future. Visioning is an empowering method for communities to take command of their future by deciding how they wish it to be in their own terms. It is a process where people share their expectations and reach consensus about an ideal future by critically reflecting on it (Evans et al., 2006). The vision of the future reflects people’s values and assumptions, their biases, their culture, family and their subsequent decision-making and action (Tilbury and Wortman, 2004).

Scenarios have long been used by the business planning sector (Wack, 1985), and together with Visioning, they have more recently been applied to natural resource management planning (see for example, Peterson et al., 2003a,b; Millennium Ecosystem Assessment, 2005; Evans et al., 2006) at different scales, from local to global. The value of Scenarios and Visioning has been recognized by environmental education experts around the world (Wisconsin Center for Environmental Education, http://www.uwsp.edu/cnr/wcee, 28/03/2007; European Union, 1998; Centre for Environment Education, 2005; Telg, 2000; Tilbury & Cooke, 2005).

This paper presents how Scenarios with Visioning are useful tools for environmental education, particularly when environments (social and biophysical) are changing. It describes the Scenarios and Visioning methodologies and presents lessons learnt from applying them to environmental education with children and youth in Peru. The authors conclude with a discussion and analysis on the benefits and challenges of using scenarios for environmental education in reaching environmental awareness objectives.

SCENARIOS AND VISIONING METHODOLOGIES

Scenarios
Scenarios methodology (Box 1) is flexible and can be adapted to suit specific needs of the participants, varied objectives or physical and/or methodological constraints. During a Scenarios exercise, participants identify historical eras of change and renewal (step 1) using a timeline. This allows them to identify key past eras and trends. Then, they discuss current issues. These issues are the “focal questions” (step 2) and identify driving forces (step 3) or change factors that influence the community. Role play has proved to be a valuable tool in motivating exchange of ideas, level of
abstraction and reflection and to start the scenarios discussions (Lopez et al., 2006; Prieto et al., 2006).

After two or three key driving forces are identified, they can serve as starting points (step 4) for constructing the scenarios narratives (step 5). These narratives should be plausible and answer to “what if...” questions. Once the narratives are ready, participants discuss among different groups (step 6) and refine their stories, adding shocks or surprises and analyze their impacts in terms of “opportunities and threats” and plan how they can best prepare for each scenario (step 7).

Box 1. Scenarios steps

**Step 1: Identify historical eras of change and renewal**
By using a timeline that goes as far back as possible, participants identify key eras and trends, discuss changes and identify the forces that drive these changes.

**Step 2: Identify the focal questions**
The focal questions are the main concerns or topics of the Scenarios exercise. Participants discuss: “What are your main questions about the future related to (topic of the exercise)?”

**Step 3: Identify driving forces**
Examples of driving forces are new government policies, environmental changes, ethnic conflicts, market price shifts, health problems, roads, etc. Participants review the list of driving forces identified and classify each of them as “Certain” or “Uncertain” and “within control” or “beyond the control” of the community.

**Step 4: Defining the starting points**
This step creates the opening sentences of the scenarios. It is the equivalent of saying: “Once upon a time… (fill in with starting points)”. Changes in driving forces can be used as starting points for the scenarios.

**Step 5: Create narratives**
Participants use the starting points to weave rich, coherent, plausible narratives. They can use a time line to represent how the different drivers will play out. Alternatively, they can use “what if...” questions to deepen the stories.

**Step 6: Present and discuss**
The participants present their scenarios and discuss the implications, in terms of “winners and losers” and changes in their communities.

**Step 7: Refine the narratives and analyze impacts**
Participants refine their scenario narratives based on the feedback and check for consistency and plausibility. A shock or surprise can be introduced into the scenario and the group discusses how the community can adapt. After the groups have refined the narratives, they discuss the impacts of their scenarios and how they can prepare for each in terms of opportunities and threats.
Visioning
By using Visioning (Box 2), participants come up with one image or description of their desired future, unlike Scenarios, where the output is more than one future. During Visioning, the participants discuss today’s concerns and decide on the time frame, this means, how far in the future they want to look at (step 1). Then, using different techniques such as “a walk in the future”, “guided vision”, or “building on the best”, individual participants develop key elements of their vision of the future (step 2). Next, each break-out group comes up with their own vision building on individual’s contributions to the discussions. This could be done as a drawing or a story as a group (step 3). Finally, each group presents their vision and they discuss and rank key elements of each vision in plenary.

Box 2. Visioning steps

**Step 1: Decide timeframe and discuss today’s concerns**
Discuss the timeframe for the vision. The number of years will depend on the context and application. For example, the local government may use a 5-year planning cycle, or a community may be planning for a development project (new roads, housing development or waste management). It may be more useful to imagine even further into the future or within a smaller time span.

**Step 2: Develop the vision of the future**
These are three suggested options for building a vision of the future.

**Option 1: A walk in the future** - Request that participants relax, close their eyes, and clear their minds. Start them on an imaginary trip into the future. Now lead the group in a walk around the community. Stop at specific points in and around the community, such as the stream, well, road, school, agricultural areas, and houses and ask them to describe what they “see” in the ideal future.

**Option 2: Guided vision** - This approach is ideal if the exercise is not taking place near the community. Request that participants sit quietly, relax, close their eyes, and clear their minds and imagine the community in say, 20 years time and ask questions about how exactly it looks. After fifteen or twenty minutes of imagining, the participants open their eyes and write down or draw the things that stood out most in their vision.

**Option 3: Building on the best** - If participants already followed the Scenarios steps, they can use these as a starting point for the Visioning exercise. Ask the participants to present their scenarios and identify all of the positive aspects. Break into small discussion groups, and have the participants discuss those positive aspects or qualities. Then ask them to think about an ideal future based on those aspects. Some things might not be possible or make sense when put together. The participants should discuss these issues and decide what aspects to keep.

**Step 3: Drawing tomorrow’s vision**
After the developing their vision, participants return to the workspace and ask the participants to draw or write down their desired vision in small groups. This step is best done without facilitation, allowing the participants to organize themselves and decide how they will complete the task.

**Step 4: Presenting, discussing, and ranking**
The break-out groups go back to the workspace and tape all of the visions on the wall. Each group presents its work. Then the entire group discusses and compares their visions. After the group discussion, the facilitator posts the list of ideas on the wall to vote on them. This activity requires that the participants share their ideas, understand the concerns and visions of the other participants, and prioritize them together to arrive at a consensus. It also gives an equal voice to all participants.
SCENARIOS AND VISIONING APPLICATIONS FOR ENVIRONMENTAL EDUCATION

Environmental education relates largely to concerns about the future - to the extent that if communities do not consider the way the environment is managed in the present, the future may be projected to be correspondingly gloomy. The Brundtland Commission stressed that sustainable development is a process of change with the future in mind: “A process […] where the exploitation of resources, the orientation of technological development and institutional change, are made consistent with future as well as present needs.” (World Commission on Environment and Development, 1987, p. 9).

Insights into young people’s views of the future have emerged from studies utilizing a variety of methods including questionnaire survey, qualitative interviewing and analysis of children’s drawings. From all of these studies it is clear that young people hold, and are able to express, a variety of concerns and ideas relating to the future. Findings about the nature and depth of such concerns, however, differ between studies: some reporting definite pessimism and cynicism about the future, while others, more positive futures (Rickinson, 2001). This variation could be due to the fact that such studies have not taken into account the fact that young people are able to conceptualize different scenarios for their future.

The concept of "alternative futures" has been widely explored (Shane, 1973) in environmental education practices. An alternative futures model will identify the directions in which current trends are leading, but it then asks questions like "What changes in our existing planning will change these trends, and in what ways?". Use of the computer as a data processor can speed up the development of alternative futures models by allowing for the rapid manipulation of massive amounts of data.

Following are lessons learnt from applying Scenarios and Visioning to environmental education with children and youth two different environmental, socio and economical contexts and with similar environmental awareness objectives in Peru (see Table 1).

Table 1. Comparison of key statistics of the Scenarios and Visioning exercises

<table>
<thead>
<tr>
<th>Participants and Location</th>
<th>Participants age range</th>
<th>Number of participants</th>
<th>Female participation</th>
<th>Duration of exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students high school, Piura, Peru</td>
<td>11-13</td>
<td>25</td>
<td>40%</td>
<td>1 day</td>
</tr>
<tr>
<td>Technicians, Piura, Peru</td>
<td>18-25</td>
<td>22</td>
<td>36%</td>
<td>1 day</td>
</tr>
<tr>
<td>Students universities and technical institutes, Puerto Maldonado, Peru</td>
<td>17-26</td>
<td>28</td>
<td>57%</td>
<td>2 days</td>
</tr>
</tbody>
</table>
Case 1: The Chalaco sub watershed and the Sustainable Development Mountain Ecosystem Programme in Peru (PDSEMP)

The Sustainable Development Mountain Ecosystem Programme (PDSEMP in Spanish) was established to contribute to natural resource management of the Chalaco sub watershed in Northern Peru through an environmental management program. Chalaco is a rural district located in the highest part of its watershed. It influences the water regime and has unique remaining forests of high biological and ecological importance. Its inhabitants are worried about conserving these ecosystems, because their livelihood depends on them (Lopez et al., 2006). 80% of the natural forest of the watershed is deforested (PDSEMP home page, http://www.udep.edu.pe/programachalaco, 28/03/2007).

The population lacks access to basic health services, suffers from malnutrition, and has poor quality of education with limited access to information outside the community. Most economic activities are subsistence-oriented and in general, the population has little entrepreneurial experience. The closest town with all basic infrastructure (water, health, market, information and education) available is 5 hours away by road. On the other hand, there is a great interest in the community mobilize themselves, particularly from women groups.

In this context, Scenarios exercises were developed with two groups. The main objective was to reflect about future changes in Chalaco’s environment and to raise awareness on the role of its population in the conservation of the mountain ecosystems. The first group consisted of 25 secondary school students, 40% female, age ranged between 11 to 13 years. The second group consisted of 22 villagers, technical students and technicians from the PDSEMP, 36% female, age ranged between 18 to 25 years. Each group was divided into four break-out groups who developed and presented their final scenarios to each other in plenary. The exercises and other planning activities have helped refine the PDSEMP. Initially the PDSEMP focused on broader activities dealing with the environment but soon realized that there is a need for more focused projects such as reforestation projects, producers' organization and marketing linkages and improvement of water use (Lopez, personal communication, 2006).

Lessons Learned from Applying Scenarios and Visioning in Chalaco

The first lesson learnt relevant to Environmental Education is simplicity. Originally, the facilitators followed the Scenarios methodology using a structured time line exploring scenarios for the next 5 and 10 years for Chalaco but this proved to be challenging since the children involved did not have the perceptive ability to think about a 5 and 10 year time lapse. The facilitators focused on Visioning during the smaller group sessions, which lead to drawings or narrative stories as outputs but allowed the groups to gain an understanding of futures thinking in a more unstructured manner.. Facilitators used the analogy of the making of the movie, where in daily life everybody was an actor and the setting was the watershed. Facilitators explained that although the story of the movie continues to unfold through the actions of the various members of the communities (the actors), the ending will depend on the collective decisions that are made today.

The second lesson relates to socio-cultural issues and authoritarian schooling. It was very challenging for students to separate the concept of grading from creative activities even in extra-curricular settings. For example, one of the children in the break-out groups worked in a separate room, when a second group got in to share the same space; the first group got distracted and started comparing its work with the incoming group, in terms of what drawing (Visioning output) was better or worse. Conveying the message that drawing is a way of thinking through about the future and not a
competition among the different groups was an important message to convey. Moreover, one of the participants insisted in a negative scenario and he was vetted by the group who preferred a positive only scenario. In the students’ view, a positive scenario is “good” and will please the authority figure (in this case, the facilitator).

A third lesson relates to the level of critical analysis. A deeper level of analysis (time line with two year intervals) was only possible with the older groups. In some cases, the scenarios presented by the children included unrealistic aspects in them, probably reflecting their good will. In the case of youth, making the connection between the Scenarios and Visions with the objectives of the PDSEMP project was helpful for the participants to realize the importance of planning for the future, which coincides with the project’s strategic planning work, e.g. strategic development plan for the district, natural resource management plan and micro-watershed plan.

Case 2: Youth from Madre de Dios region in the Amazon of Peru

Madre de Dios is located in South-eastern Peru and is currently the least developed area of the country. The main economic activities of the region are logging, gold dredging, Brazil-nut collecting, eco-tourism and other forest extraction activities. The climate is tropical, hot and humid most of the year and its altitude is 230 m.a.s.l. The capital city of Madre de Dios is Puerto Maldonado, founded originally for the collection of wild rubber in 1902, next to Tambopata and Madre de Dios rivers. Madre de Dios’ national parks and reserves are located on the Tropical Andes Biodiversity hotspot (Conservation International http://www.conservation.org/xp/frontlines/protectedareas/11160502.xml; 29/03/2007).

Road construction and improvement in the Amazon has been a regional dream for Peru, Brazil and Bolivia (Brown et al., 2002; Nepstad et al. 2001). This dream is becoming a reality by paving the road between the Brazil and Peru. The completion of this project will have important, if unpredictable, implications for the socio-economic development of the area particularly as is taken place in the context of a recently signed free trade agreement between Peru and the MERCOSUR (Southern Common Market) countries. The Scenarios exercise was conducted in 2005, at a time where many cross-boundary changes were taking place, including regional integration, large-scale infrastructure development, and improvement of communication links. These changes were associated with management of the natural resources and increasing economic differentiation and concentration of wealth.

The two-day Scenarios exercise involved 28 university and technical students living in the city of Puerto Maldonado, 57% female participants of 17-26 years in four break-out groups. The objective was to understand their opinions about the future of the region and to explore and raise awareness on the environmental, social and economic implications of the paving of the new inter-oceanic road that connects the Amazon of Brazil and Peru crossing biodiversity hotspots areas.

Lessons Learnt From Using Scenarios and Visioning in Puerto Maldonado

In this case, facilitators used different approaches to applying Scenarios. First, there was a short “registration survey”. The answers to this survey provided useful insights into the initial perceptions of participants prior to the workshop. The survey questions enquired about the past of the region, the potential impact of the transoceanic highway and the future of the region in 20 years time. Second, the facilitators stressed the importance of coming up with clear focal questions and identification of driving forces or change factors. Third, the output of the Scenarios exercise was two scenarios from each break-out group, one positive and one negative. The main reason for choosing this approach instead of the time line method was the lack of time. The late arrival of many of the participants and the time spent defining characters for role playing took longer than planned and hence
significantly delayed the process. Therefore, the first lesson learnt from this exercise is adaptability. The Scenarios is a flexible tool and can be adapted to suit specific needs.

A second lesson learnt, is the key role of the facilitator. Although the level of analysis and reflection from the participants was mixed, the facilitators had to find the best way to stimulate reflection in order to reach to conclusions about the Scenarios by encouraging active participation, for example, involving more proactively the quiet participants and moderating the very talkative ones. The facilitators needed an in-depth knowledge of the Scenarios methodology and to be familiar with the history of the region, as well as its problems.

A third lesson is the importance of monitoring. A four-question survey was carried out and the results were very positive, receiving high rates from participants (more than 80%):
- Scenarios were perceived as a tool for group planning (83.5%).
- Participants reflected on the future of Madre de Dios, particularly with regards to the impact of the Peru-Brazil highway (90%).
- Participants learnt something new about the history of Madre de Dios and the projects that are taking place in relation to the future of the region (80.4%).

In general, the participants liked the Scenarios methodology because it prepares them to face the future, as the foundation for a plan of action. The Scenarios exercise allowed them to learn the history and reflect on the future of their region.

Finally, the mix of participants will determine the richness of the Scenarios. Since participating in the Scenarios exercise was a volunteer/extra-curricular activity, only those who are curious about the topic, concerned or interested attended. Not surprisingly, most of the participants were students of forestry, ecotourism and agro-industries. The lack of other disciplines was notorious and conducive to a biased assessment.

CONCLUSIONS

Scenarios and Visioning have proved to be useful for children and youth to motivate them to think critically about the future. The Scenarios and Visioning exercises accomplished its objective on raising awareness on building the future of Chalaco and in Puerto Maldonado. They help them to systematically think about possible uncertainties and how to deal with them.

Scenarios and Visioning approaches should consider the cultural and social context of the application such as sense of authority (formal educational grading systems), the level of critical analysis and participants’ social, economic, cultural and educational backgrounds. Hence it is important to have the right mix of people to build the Scenarios. For younger children, answers they provide may be heavily influenced by those around them (especially parents and older siblings) and therefore developing activities around decision making in the household, may provide further insight. Appropriate facilitation in all Scenarios and Visioning is necessary for conveying the approach clearly, without compromising the details in the methodology. There is a certain level of complexity involved in the approaches that the facilitator should fully understand.

The main benefits of the Scenarios and Visioning methodologies include:
- Flexibility: Can be adapted to the local resources available, it does not need to be an expensive exercise.
• Adaptability: Can help to develop planning capacity along with long-term thinking. The strategies could work in two or more alternative futures explored; therefore, have a greater chance of succeeding than strategies that are based on only one kind of possible future.
• Investment in long-term benefits: increased capacity of forward looking, planning and critical thinking.
• Awareness of roles in communities: Participants gain a sense of their roles and others in their communities in shaping their future and the actions needed to make it happen.
• Community Ownership: Creating their own vision of their future and provides them with tools for monitoring their own progress.
• Identification of underlying socio-cultural values: Key driving forces or factors that bring about different types of change are identified in the assessment of different futures.

Scenarios and Visioning, have proved useful for environmental education because they make participants feel responsible and empowered to adapt to changing environments or to take action to reach their vision for a better community by raising their awareness on environmental issues. These tools can be adapted to formal or informal settings, different target groups, by age, gender, socio-economical and geographical contexts. The application of these methodologies contributes to further understanding the biophysical and socioeconomic forces behind environmental changes and facilitates the creation of collaborative strategies for adaptation and mitigation of these changes for the betterment of future generations.

REFERENCES


