# The 'Happy Strategies' Game

# Matching Land and Water Interventions with community and landscape needs

## 1   Introduction

Integrated water management is a relatively new concept that seeks to overcome the differentiation between rain-fed and irrigated land (Rockström et al., 2010). It looks at a whole range of water management practices related to crop, livestock and trees, and seeks to understand how these practices can be bundled within a watershed, also referred to as rainwater management strategy (RMS) at landscape scale.

Defining landscape specific RMS that improves livelihoods of smallholders by optimizing water retention or water productivity has thus become a multi-dimensional, unstructured and complex environmental problem (Bose and Bose, 1995) . Indeed, for each landscape there are many possible objectives, and as many possible rainwater management practices that can be combined into a strategy.

Stakeholder participation is often seen as a viable – and essential - approach to make decisions in these unstructured problems that must adapt to changing circumstances and embrace divers knowledge and values (Reed, 2008). Nonetheless, there are only a few methods to involve stakeholders into unstructured complex problem solving as part of a participatory process (Kolkman et al., 2005). New ways of involving stakeholders that capture the complexity of the problems to address are needed.

This paper  presents the 'happy strategies' game that was developed for the Nile Basin Development Challenge (www.nilebdc.org) as a way to involve various stakeholders in identifying and matching 'best bet' RMS practices and interventions at different scales.

The main objective if the game[1] is to provide a tool for researchers and practitioners to start a dialogue on the complex issues of rainwater management. It uses cards that describe a broad range of rainwater management practices. These are traded allowing a team to form a strategy (bundle of practices) that fits a particular landscape. Optionally, teams can add 'interventions' (extension for example) necessary to deliver their strategy. The game has different elements

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[1] The game was inspired by the 'happy families' childrens' game in which individuals or teams have to collect set of similar cards related to one another.

that can be combined in different ways, depending on the type of participants and the specific objective of the exercise.

The game can be played with experts where the objective is to validate and improve the rainwater management practices knowledge base. It has proved to be particularly useful in stimulating discussion and debate among multi-disciplinary game players.  It can also be played with communities and stakeholder platforms to start a dialogue about rainwater management in a particular landscape; it could be played with modelers or students to learn about decision-making problems on the ground.

## 2    Background

The happy strategies game was developed as part of the Nile Basin Development Challenge funded by the CGIAR Challenge Program on Water and Food. Initial versions of the game make heavy use of the landscapes, issues and concepts found in the Ethiopian Highlands.

### 2.1    Rainwater management strategies at landscape scale

In the Nile Basin Development Challenge, a rainwater management practice, hereafter referred to as practice, is defined as anything done by a farmer or a rural community to increase water retention or water productivity within a watershed. This definition assumes that a farmer or a group of farmers takes the decision to do something on their farm or land. As such it includes a broad range of practices such as water harvesting, soil and water conservation, livestock production, small scale irrigation, reforestation, agro-forestry or grassland management.

When implemented, many of these practices might increase the amount of water available within the watershed, enabling farmers and community downstream to adopt new practices. To take these synergies within a watershed into account, single practices need to be combined and bundled into rainwater management strategies that maximize water retention or water productivity at a specific landscape scale.

In ecology, the landscape is a scale. It represents a proportion of heterogeneous land composed of sets of interacting ecosystems that are repeated in a similar fashion in space. In the context of water management, the landscape scale can be understood as a watershed, that comprises a top slope (upland), a middle slope (midland) and the bottom valley (lowland), as shown in Figure 1. From this perspective a landscape approach to rainwater management suggests that synergies occurred by combing practices within a watershed are assumed constant. Impact on downstream watersheds can be assessed by hydrological models.
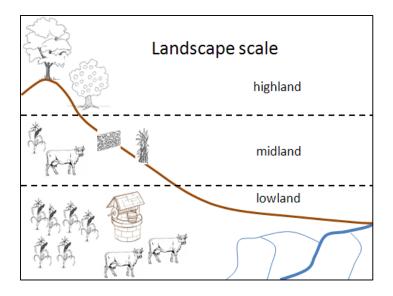
**Figure 1 : the conceptual landscape and its three zones**

We define a rainwater management strategy at landscape scale corresponds to a bundle of practices that cover the whole gradient of the landscape (upland, midland, lowlands) and maximizes water retention or water productivity within the landscape (micro-watershed or sub-basin). To maximize water productivity and water retention within the landscape, a RMS needs to fulfill deferent objectives at different locations in the landscape. Table 1 shows the major objective of a suitable RMS at a given location in the landscape.

**Table 1 : objectives of practices in the different zones and land use**

| | Main objective(examples) | | |
|---|---|---|---|
| Zone | Cropland | Grassland | Degraded land |
| Uplands | Increase infiltration (All forms of forestry, percolation pits) | Increase the quantity and quality fodder for livestock (over sawing, area exclosure) | Rehabilitated degraded land (half moon, forestry) |
| Midlands | Increase soil and water conservation (bunds, terraces, in situ water harvesting) | | |
| Lowlands | More efficient use of surface or shallow water (Wells, rivers | | |
| Independent | Increase water | | |

| | availability in the dry season (Ex-situ water harvesting) | | |
|---|---|---|---|

In the uplands, the objective could be to increase water infiltration, mid elevation land practices could aim to increase in-situ soil and water conservation. In the lowlands the objective of a practice could be a more efficient use of surface and shallow water. Ex-situ water harvesting techniques can be applied everywhere across the landscape where water can be collected and used for supplementary irrigation or for livestock.

Next to practices that are closely related to farmers' decision making, interventions are defined in this game as anything done by a government or NGO's or any other actor to initiate a practice change. Note that these definitions differ from the ones used in environmental sciences where the word *intervention* refers to any practice that intervenes on the landscape structure.

## 2.2  Rainwater management practices

The game was designed to validate and build upon an initial database of existing and potential RMS practices in the Blue Nile Basin. Developed through literature review and expert knowledge acquired through stakeholder participation, for each practice it provides information about its purposes as well as any bio-physical, socio-economic and institutional condition of success. For this database, RMS were defined very broadly to include traditional water-crop related practice, agro-forestry and livestock oriented practices.

Bio-physical conditions suitability conditions are relatively well defined in the literature (Desta et al., 2005). Socio-economic suitability is less well understood and sometimes contradictory (Amha, 2006; Deininger and Jin, 2006; Deressa et al., 2009; Hagos, 2010; Petros, 2010). These conditions have been validated in several expert meeting. When contradictory conditions were found, the one suggested by the experts was retained.

From this database, half of practices were used to develop the game. The selection of these practices was based on the potential impact, as well as their relevance in current policy and NGO work.

# 3 Basic elements of the game

The main task of the game is to bundle different practices into a strategy that fits the characteristics of a given landscape. The game consists of several support materials, and is implemented with several support persons. The game has several steps that are always the same. However the detailed rules of the game can be changed depending on the objective of the game and the prior knowledge of the players.

## 3.1 Support material

### 3.1.1 Conceptual landscape

The conceptual landscape description describes the conceptual approach presented under section 2.1. It is presented to the participants as an introduction to water management, and aims to clarify the vocabulary used in the game.

### 3.1.2 Landscape descriptions

Landscape description describes the landscape for which a rainwater management strategy needs to be fitted. This description needs to cover the bio-physical characteristics, socio-economic and possibly the institutional context. Bio-physical characteristics can be presented with maps and the socio-economic context can be retrieved from national statistics. This information can be printed on paper and distributed to the participants. The description can be completed with stories from different point of view or from different stakeholders that are active in the landscape.

### 3.1.3 Practice cards (different colors)

Practice cards, shown in Figure 2, describe each selected practice from the database. Each illustrates the practice with a picture and as well as the hydrological, environmental and socio-economic purpose and the bio-physical, socio-economic and institutional context.

| Practice picture or illustration |
|---|

**Hydrological purpose:**

**Bio-physical purpose:**

**Socio-economic purpose**

**Suited to altitude?**

**Suited to slope?**

**Suited to rainfall conditions?**

**Suited to soil conditions?**

**Suited to degraded land?**

**Land needs**

**Required level of labor input?**

**Required level of capital investment?**

**Generates additional fodder?**

**Requires access to markets?**

**Required level of cooperation**

**Figure 2 : standard practice card form used to describe each practice**

In the game, water management practices were classified into different categories each of which has an own color. Soil and water conservation is in yellow, agro-forestry is in green, in-situ water harvesting is in brown, ex-situ water harvesting is in blue, water lifting is in pink, livestock and grassland related practices are in black and finally fertility management is in turquoise.

### 3.1.4 Innovation cards

Innovation cards are blank practice cards that can be filled by the players. It allows them to add new practices that are not yet part of the game.

### 3.1.5   Intervention cards (red)

Interventions card are a blank form that players can suggest interventions necessary to make their strategy successful, and why. Examples of interventions are improved extension services, better access to credit or supply chain development.

## 3.2   Support persons

To play the game, several supporting person are needed.

A **facilitator** introduces the game, its objectives, the specific rules and makes sure that the landscapes are well presented and described.  He helps out when the game is stuck.

A **landscape manager** facilitates discussions for a group of players forming a team whose task is to formulate a strategy. The landscape manager:

1. Manages time and process
2. Reminds people of the instructions.
3. Helps people to reorganizing practice into strategies by suggesting to locate in each practice into the different landscape zones.
4. Facilitates the negotiation process.
5. Hands out intervention cards when necessary.
6. When the group agree on the strategy, guides the discussion towards interventions (what can other actors do to enable the strategy)

There should be between 7-12 people in each group facilitated by landscape manager.

A **help desk** is a sort of information center where players can ask for more information about each practice card. The help desk also holds all cards that are not yet uses in the game. Depending on the specific rules, the help desk can exchange practice cards or give out new practice cards. The help desk also support players to fill innovation cards correctly.

## 3.3   Documenting the game

To learn from the game, different steps need to be documented.

Two different **tracking forms** can be used: the landscape manager form and the help desk form. Landscape managers write down the initial set of practices at the beginning of the game, and the final set of practices, which represents the strategy. They also keep track of all innovation and intervention cards that are filled in. They also track exchanges of practices with other landscapes, as well with the help desk. They also try to keep track of synergies and trade off that emerge in the discussion.  Typically, the end result is photographed and any presentations of the game results can be captured on video or text.

The help desk form is used to track the exchanges the help desk have been authorizing as well as the innovation cards that have been filled.

**Flip charts** are useful tools for the landscape manager to involve the players. It can for example be used to design the landscape and its 3 zones, and to locate or position practices within the landscape. The visual result of the game is often a useful discussion point.

At the end of the game, each group (or landscape) **presents** their final strategy and defends it. They have to explain the chosen objective for the landscape and how this objective is addressed by their strategy. The process of getting to the strategy, and trade-offs and assumptions made, are often important elements of the presentation – they also need to be documented.

## 3.4 Two fundamental variants of the game: the role of the participants

The game has two fundamentally different variants, assigning different roles to the participants.

**Variant 1** : Each participant identifies himself with a practice of his or her own choice at the beginning of the game, and the player needs to find a landscape that 'adopts' him or her. In this variant, each landscape has the same number of practices that there are persons in the team. In this process, the practice needs to fit the landscape characteristics as well as the other participants' choice. When this variant is played, the participants can decide to change landscape (when several landscapes are available) or try to trade cards at the help desk. Trading rules can be developed.

**Variant 2** :  Each participant is part of a community that gets a set of random starting practices. As a team, they need to use their practices and any other resources improve the livelihoods of the allocated landscape. Collectively, they decide which practice need to be exchanged, and for what new ones. In this variant, there is a fixed amount of practices for each landscape independent of the number of participants in a team.

Variant 1 leads to a more dynamic game especially if there are many participants (more than 50 persons). I It allows participants to identify with a practice, rather with with him or herself. This allows breaking the hierarchical relationships that might rule behavior between participants and help to gives everyone an equal voice.  Variant 2 is preferred when there are fewer participants (20-30); it ensures that enough cards are in circulation. Variant 1 is much more about trade-offs and individuals advocating for specific practices while variant 2 is more about collective behavior.

Nonetheless, the steps of the game remain similar and are the following.

| | What | Who |
|---|---|---|
| 1 | Introduce the game, the objective and the general rule | Facilitator |
| 2 | Describe the landscape | Facilitator |
| 3 | Describe the specific rule | Facilitator |
| 4 | Introduce the " help desk" and the "landscape managers" | Facilitator |
| 5 | Send people to the "help desk" (variant 1) to select ones personal practice card or to the "landscape managers" (variant 2) that hand out the set of practice card for the group. | Facilitator |
| 6 | Ask people to amend the card (depending on the objective of the game | Facilitator |
| 7 | Start discussing | Landscape manager |
| 8 | Hand out innovation and intervention cards when needed | Landscape manager |
| 9 | Perform exchange with other landscapes and help desk given the rules | Participant, help desk |
| 10 | Ends the discussions and proceeds toward reporting | Facilitator |
| 11 | Feedback  from the different groups | Participants, landscape manager |
| 112 | Scoring | Depends on the rule |

# 4   Adapting the game to the objective and target group

## 4.1   Different participants and different objectives

This game can be adapted to various different situations, depending on the objective and therefore also on the prior knowledge of the participant. Figure 3 shows the different objectives of the game depending on the prior knowledge of the participants. The two major axes are the knowledge about the Ethiopian context and about specific landscapes as well as the knowledge about rainwater management.

When participants have a high prior knowledge of the Ethiopian landscape, the game allows making use of their knowledge for validating the database (in which case it is up to the facilitator to make sure that there is space for amending the practice cards) as well as developing context specific strategies and indentifying the necessary intervention to enable the practice adoption. When the participants have less knowledge about integrated water management, the game can also be used to raise awareness about synergies between some practices at landscape scale. This understanding may lead to discussion about benefit-sharing mechanisms that can be taken up into a community discussion.

When participants have prior knowledge about integrated water management, then the game also allows to collect expert knowledge on synergies between different practices, both at farm and at landscape scale.



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                              +
  Defining context specific strategies    Knowledge about Ethiopian landscapes

  Validating the database Learn about          Defining context specific strategies
  context specific interventions
                                              Validating the database
  Learn about context specific interventions
                                              Learn about context specific
  Awareness rising about synergies between    interventions
  water management practices
                                              Learn about existing synergies
      -                                                                      +
                                        Knowledge integrated water management

  Teach about complex real problems          Identify rationales about bundling
                                             rainwater management practices
  Awareness rising about water issues and
  Ethiopia                                    Validate the database
                              -
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**Figure 3 : different objectives given the prior knowledge of the participants**

When participants have little knowledge about the Ethiopian context and its landscapes, the game has different objectives. If prior knowledge of integrated water management, then it allows to collect more theoretical knowledge to validate the database and to identify rationales about how to bundle rainwater management practices based on theoretical knowledge about synergies between practices.

Finally if the participants have no prior knowledge of integrated rainwater management strategy, the game is a teaching tool that allow participant to learn about a real complex problem, and raise awareness about water issues in the Ethiopian context.

## 4.2   Landscape descriptions

The landscape description can be based on real cases but can also be a "virtual constructed" combining features from different existing landscape. When participants have little knowledge about the Ethiopian context, it is suitable to work with one "virtually constructed" landscape.

The landscape bio-physical characteristic can be inspired by a real landscape, and the socio-economic characteristics can be stereotyped for any area in Ethiopia. In this way it makes it easier for participants to understand a simplified Ethiopian context. If this version of the game is played, different strategies will be developed for the same landscapes, and can be compared among each other.

If participant however come from certain area, or have a good prior knowledge of the area, real landscape can be described with their real socio-economic and institutional context. When this option is chosen it makes sense to have an many different landscape as the participants come from or know of. When this variant is chosen different strategies for different landscape are developed and can hardly be compared with each other. If the number of participants allows, having two group for each landscape definition.

## 4.3   Practice card selection

The currently available practices cards contain the most important practices that the NBDC has identified in the Blue Nile and covers about 45 practices. But this list can be easily extended with other practices that are already in the database, or by adding practices suggested in previous games with the innovation cards. This list should be a living document that should be growing each time when the game is played.

Nonetheless, it is important to select the initial set of cards. If participants have prior knowledge of the Ethiopian context and the different practices, the proposed set of practice can be relatively big and include cards that might not fit the bio-physical context of any of the landscapes. This approach allows to validate the database and increase the discussions.

When participants have little knowledge about the Ethiopian context and the different practices, it is better to reduce the initial set of practices and select only feasible ones.

When the variant 2 of the game is chosen, each landscape receives 10 cards making sure that there are all different and cover all the categories (colors of the cards). In addition the set contains at least two innovation cards and 5 intervention cards. In variant 1, the innovation cards and interventions cards are hold by the landscape manager that hands them out up-on request.

## 4.4   Trading rules

Trading rules can be thought of. For example you can freely trade a card within the same category (color) at the help desk. Exchanging a card with a practice from a different color, should be less easy in order to maintain some dynamics in the game. Exchanging two for one is an option when there are many participants in each group (> 10 participant). Otherwise, a

practice needs to be refused at least 2 other landscapes before having the right to change it at the help desk.

In order to allow for a creative process, innovation and intervention cards should be unlimited for each group.

## 4.5 Emphasis on interventions

When the objective is to identify context specific strategies, landscape manager should be careful and emphasize the need of also identify constraints of the strategy and define suitable interventions. On the contrary, when the objective of the game is to identify how to bundle strategies or to teach, interventions are less important to focus on.

## 4.6 Feedback from the group and scoring

Each group needs present its strategy to the rest of the participant. Sufficient time should be allocated to this part so that discussion between the different groups can take place. This is of particular importance when the objective of the game is to identify context specific landscape with stakeholder or community. Then it also does not really make sense to rank the strategies.

When the game is played as teaching or as figuring out a rational for bundle the feedback session can also be used for scoring. A scoring mechanism can be thought of and use to rank the different practices. If only one landscape definition has been used, it is relatively easy, and criteria as ; fitting the bio-physical characteristics, fitting the socio-economic characteristics, fitting the own defined objective, innovation, synergies and suitability of interventions could be used as criteria. A panel of expert could for example rank the different strategies. Also each group can rank all the other groups based on the final strategy presentation.


## 5   How we played the games

In the frame of the NBDC, the game has been played twice: first at the NBDC stakeholder workshop in October 2011 (see Figure 5) and secondly, at the CPWF International Forum on Water and Food (IFWF) in November 2011.

We also plan to play the game with communities, innovation platforms as well as with SWAT modelers (hydrological modelers). Involving communities and innovation platform members would aim at developing context specific strategies and discuss ways of implementing them. Playing with SWAT modeler around the world would aim at teaching about the Ethiopian context and sensitize modelers to real complex problem and discuss their implementation into abstract models.

Figure 4 shows on the axes presented in Figure 3, the spectrum of knowledge and therefore the objectives of the various games.
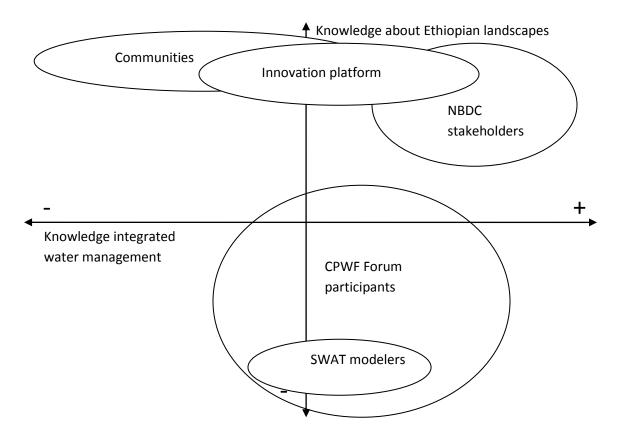


**Figure 4 : matching participants and objectives in the NBDC context**

The first game used variant 1 rules. The NBDC stakeholders are involved in the project and therefore knew the Ethiopian landscapes, particularly the 3 study sites and the concept of integrated water management. The workshop involved close to 70 people. The objective was to validate the database, enlarge the database and identify which practices might form synergies with others at landscape scale. It was also the first test of the game approach. In this game, we used 'real' data from the project sites.

The three NBDC study sites were used as 3 different landscapes; we had two groups per landscape. Participants were first asked to choose their practice and correct the cards. Then they could join the landscape of their choice, taking care there were enough people in each landscape.

The trading rule applied was, two for one at the help desk, or any deal with another landscape. Two innovation cards and an unlimited amount of interventions cards were given to the landscape managers. The trading rule one for two was very limiting for the smaller groups. This

has lead to the understanding that this rule should only be applied for big groups. In some cases 2 innovation cards were not sufficient and the trading rule one for two even more restraining innovation.

Several lessons were learnt in this game. It allowed people to talk easily about multi objective multi criteria problems. Participants could learn from each other. Also some cards could be validated. The quality of the facilitation at the landscape matters really matters for the quality of the discussions and strategy development. The concept of interventions was not always understood; consequently some innovation cards were used for interventions. Finally, one and a half hours is simply too short to also include reporting back from a large group.



**Figure 5 : participants discussing a "happy strategy" at the NBDC stakeholder workshop.**

The game at the IFWF brought together a broader range of scientists and stakeholders that work on water management from 6 basins. Some participants came from the Nile, but most were from different areas and had very little knowledge of the Ethiopian context. The objective was to present our database and the Ethiopian context to people from other regions. An additional objective was to learn from other regions in the world about possible new practices.

In this game, we used composite data from the three Ethiopian sites, creating a fictitious 'Jegerida.'

In this game, variant 2 was played with a virtual landscape. In this form, the game was perceived much more as a discussion tool. In this version, innovation and intervention cards were hardly used, whereas the discussions clearly discussed these issues. Nonetheless, this version seems to work well with people that do not know the sites or the different rainwater management practices.

# 6   Conclusions

The happy strategies game allows groups of people of different backgrounds to start discussing multi-dimensional, unstructured and complex environmental problems. It allows participants to learn and negotiate with each other and at the same time provide relevant information to scientists working on integrated rainwater management. The happy strategies game is very flexible and can be adjusted to many different situations with different participants. It has two fundamental variants, but almost every part of the game can be modified and adjusted to the particular objective and participants. From both rounds played, participants enjoyed playing the game and were very positive about it.

# 7   Support material

A " Happy Strategy tool box" is available under xxx. It is a zip file that contains :

1. Full set of cards, including innovation and intervention cards
2. Tracking forms
3. Landscape descriptions
   a. 3 NBDC study site description poster and a conceptual landscape
   b. Virtual landscape poster and PowerPoint description
4. Additional material
   a. Report from the game played at the NBDC workshop
   b. Report from the game played at CPWF forum
5. Report from NBDC  stakeholder workshop and CPWF forum http://nilebdc.org/tag/game/
6. Video from CPWF forum
   Links to NBDC website
7. Links to photos from the games played so far

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