

Field Notes - social sciences

A “Serious Game” to Explore Alternative Forestry Futures

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Abstract

Serious games are designed to achieve specific educational or other practical purposes beyond pure entertainment. These games take many different forms—from card decks to massive multi-player online games—and have proliferated across diverse fields. This note introduces *IMPACT: Forestry Edition*, a serious board game designed to help forestry professionals and stakeholders think more broadly, critically, and creatively about the future of forestry. We describe the game and feedback from beta testing and discuss the advantages and potential drawbacks of gaming methods. A “print and play” version of the game is included as supplemental material. Serious games can make an important contribution to forestry by engaging and informing diverse stakeholders and generating insight that other methods cannot.

Study Implications: “Serious games” are designed to achieve educational purposes beyond pure entertainment. Games can engage and inform diverse stakeholders and generate insight in ways that other methods cannot. The growing use of serious games to address important objectives in many fields suggests the usefulness and effectiveness of these approaches. This note introduces *IMPACT: Forestry Edition*, a serious board game designed to help forestry professionals and stakeholders think more broadly, critically, and creatively about the future of forestry. The game has been shown to facilitate a forward-looking view of forestry and help players broaden their thinking about alternative forestry futures.

Keywords: Gaming, serious games, future of forestry, IMPACT: forestry edition

The use of games to achieve serious goals has an ancient history. War games played on game boards or parchment maps date back at least to the Middle Ages (von Hilgers 2012) and are still used in today’s military. Indigenous people have used and continue to use games as learning and teaching methods to achieve community goals (see, for example, LaPensée 2018). Serious games have proliferated in recent years and

evolved well beyond their origins. A wide range of serious games have been developed in diverse fields such as education, national security, health care, emergency management, and conservation. These games take many different forms: card decks, board games, in-person and online immersive role-playing, video games, and massive multiplayer online games. The practical purposes of these games include engaging

stakeholders and communities, teaching, informing planning, and solving real-world problems.

We developed a serious game for forestry and natural resource professionals and stakeholders. *IMPACT: Forestry Edition* is a board game that explores alternative futures of forestry. The mechanics, dynamics, and aesthetics of the game were adapted from *IMPACT: A Foresight Game* created by Idea Couture in collaboration with Policy Horizons Canada (<https://www.cognizant.com/idea-couture/impact/>). Our game incorporates actual “signals of change” (trends and developments that could help shape the future of forestry) found in an ongoing Forestry Horizon Scanning project (Hines et al. 2019). *IMPACT: Forestry Edition* has been successfully used as a warmup activity in workshops on the future of forestry and before scenario planning exercises to help participants think more broadly and creatively about the future. Other possible applications include use in forest planning and policy courses, strategic planning processes, visioning exercises, and stakeholder engagement activities.

The following section describes the components of the game and provides an overview of gameplay. This is followed by a summary of beta testing and evaluation of the game. The advantages and potential drawbacks of gaming methods are then discussed. A “print and play” version of the game is included as [Supplemental Material](#).

IMPACT: Forestry Edition

The objective of *IMPACT: Forestry Edition* is to help players think more broadly, critically, and creatively

about the future of forestry and natural resources. Players take on the role of a character with a “job from the future” and compete with other players to achieve their character’s preferred future. In the process, they learn about a wide range of possible emerging developments that could affect, disrupt, and shape the future of forestry.

Components

The physical game consists of a rulebook and the following components:

- **Ten “job from the future” avatar cards** that identify a character and describe the character’s future job, such as “Experience Concierge,” “Smart Forest Technician,” and “Future Generations Representative.” The job of each avatar reflects the way present jobs could evolve in the future. Each player plays as one of these characters with their unique job description and corresponding set of preferred future conditions.
- **One hundred impact cards** that describe a possible future development or trend; for example, “Legal decisions sustain the rights of mother nature—rivers, lakes, wild rice, and more have legal standing” (Figure 1). The cards also identify the impacts of the development: primary impacts, predetermined secondary impacts, and player-determined secondary impacts. These three types of impacts allow players to add or remove “influence cubes” (see below) to move toward their character’s preferred future.
- **Eight disruption cards** that describe possible large-scale shifts in the system and their effects on certain domains. For example, a “Carbon-neutral economy” disruption card is described as “Countries, states, cities and businesses set and surpass carbon-neutral goals by 2030” with impacts of +2 on the energy domain and +2 on transportation (Figure 1).
- **Ten domain tiles** that are placed in the center of the playing area and represent social, economic, and environmental domains that could be affected by the impact and disruption cards: energy, transportation, forest ecosystems, water, recreation, community

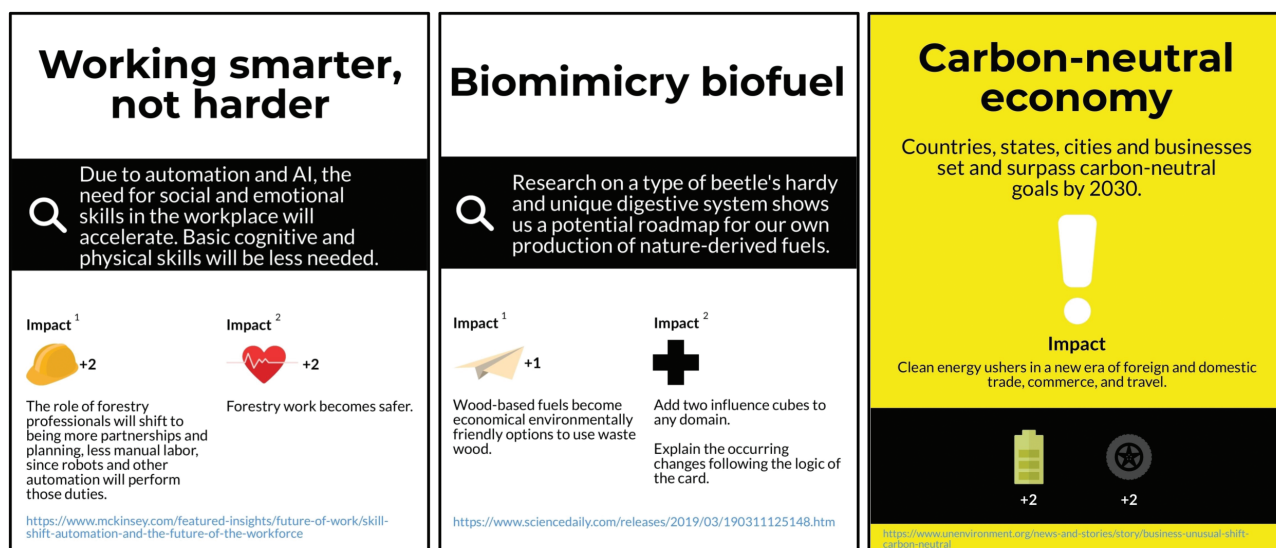


Figure 1. Examples of two impact cards and one disruption card.

and culture, work, medicine and wellness, forest products, and food/agriculture/ranching. A domain “quick guide” card concisely defines each of the domains.

- **Influence cubes** are wooden game pieces that are added to, subtracted from, or moved between the domain tiles. Influence cubes represent the effects of impact and disruption cards on the various domains.
- **Five protect tokens and one judge token.** Protect tokens allow players to protect the influence cubes on a chosen domain (i.e., prevent other players from removing them or moving them to another domain) for one round. The judge token is used to indicate which player is currently serving as judge, which changes with every round (see the “Gameplay” section below for the role of the judge).

The impact and disruption cards are the core of *IMPACT: Forestry Edition*. Possible future developments described in these cards were taken directly from the database of the Forest Futures Horizon Scanning Project (Hines et al. 2019). Horizon scanning is a core Futures Research method for systematically finding, collecting, and analyzing “signals of change,” that is, emerging issues and trends that could shape the future of an organization, field of endeavor, or domain (Bengston 2019). The Forest Futures Horizon Scanning Project has generated a database of more than three thousand individual “scan hits” or signals of change. Each impact and disruption card includes the source of the scan hit they are based on.

Gameplay

This section is not meant to substitute for the rulebook, but to give an idea of how the game works. First, arrange the domain tiles in a circle in the center of the playing area. One, two, or three influence cubes are placed on each domain, depending on desired play length; remaining influence cubes are set to the side. Three impact cards are dealt to each player. All disruption cards are then placed into the remaining impact deck, distributing them more or less evenly throughout. The impact deck is put face down in the center of the domain tile circle. Each player is randomly dealt a “job from the future” avatar card containing their secret win conditions; in other words, the preferred future on their avatar card specified as the number of influence cubes required on three domains related to their job.

Each player’s turn consists of three phases: play, discard, and draw. The first player plays one impact card from their hand, triggering its effects (illustrated by influence cubes) on the domains specified on the card. Players choose a card to play that will best help them achieve their preferred future as defined by numbers of influence cubes on specific domains. Cards played are

left face up so that players may refer to them at the end of the round. The player then may, if they wish, discard any number of their remaining impact cards face down into the discard pile, getting rid of cards that do not help them achieve their preferred future. The player draws up to three new impact cards to bring their hand back to three. If they draw a disruption card, its effects on the specified domains go into effect immediately, before the player draws a card to replace it.

A round consists of each player having a single turn. Once a round ends, an impact card that was played by each player (plus any disruption cards that were drawn) will be face-up next to the board. Based on some or all the cards played over the course of the round, players create a “headline of an era” that summarizes the current state of the world as defined by the cards played that round. Generating a headline of an era requires critical and creative thinking about the cross impacts generated from the cards played over the course of the round. An era is not a specified amount of time; it could be as short as a season or as long as a generation. A good headline, like a good newspaper headline, synthesizes all impact and disruption cards into a single coherent idea like “the Roaring Twenties” captures the booming economy, mass consumerism, and artistic and cultural dynamism of the 1920s. Headlines are presented to the judge, who chooses the headline that most creatively, accurately, or often humorously captures the impact and disruption cards played during the round. The judge awards two influence cubes to the player with the winning headline, to be placed on the domain(s) of the player’s choosing.

A new round then begins, with the judge token passed on to the next player clockwise. Play continues until one player meets their avatar’s preferred future and wins the game. See the rulebook in [Supplemental Materials](#) for additional details and tips on how to play the game.

Testing and Evaluation

A beta version of the game was tested in more than a dozen small group sessions in which the game was played. Players in these evaluation sessions included graduate and undergraduate students in forestry and related fields, social scientists, university faculty, forest agency employees, and other forestry professionals and stakeholders. Small group debriefing discussions followed the game.

We asked beta testers what they liked and did not like about playing *IMPACT: Forestry Edition*. Positive

responses included the observation that the game facilitates a systemic view of forestry and natural resource management, fosters creative thinking about interactions between different trends and developments, and that it was fun to play. They also liked that the game prompted them to think about the secondary impacts of change, and that it moves quickly. Although some players thought the game was easy to learn, others thought the rules were a bit complex and intimidating at first and they would have liked more time to familiarize themselves with the components and rules. Some found it difficult to write a “headline of an era” in the allotted time. Several small errors in the beta version of the game were pointed out, including minor typos, inconsistencies, and the need for clarification of certain rules.

We also asked about the extent to which the intent of the game—to help people think in new ways about the future of forestry—was achieved. Respondents thought the disruption cards, the descriptions of future forestry-related jobs, emerging technologies and trends described in the impact cards, and thinking about alternative futures that would depart from the current forestry system helped achieve the overall goal of the game. Suggestions for improvements that would help the game achieve its intent included allowing players to write up their own impact cards or collaborate with other players to write them. One player suggested making the game collaborative in nature, with everyone working toward the same desired future condition rather than competing.

When asked about situations they could envision using the game, many mentioned a variety of classroom or other educational uses, as well as using it for community meetings, strategy and planning teams, leadership meetings, team-building exercises, forestry alumni events, and using it as an icebreaker for meetings with diverse stakeholders or in gatherings with managers from different fields and agencies. Finally, we asked about how enjoyable playing the game was and whether the participant was a gaming enthusiast. Overall, our beta testers found the game highly enjoyable, whether they were game enthusiasts or not.

Advantages and Drawbacks of Serious Games

There are many potential benefits of using games to achieve practical and important goals. Dator notes that “Games are the closest we can come to actually ... pre-experiencing alternative futures so as to have

a wider understanding of what might be viable preferred futures” (Dator 2017, p. 77). The effectiveness of gaming to achieve educational objectives may lie in its integration of learning and fun. Marshall McLuhan reportedly observed that “anyone who makes a distinction between education and entertainment doesn’t know the first thing about either” (Prensky 2002, p. 8).

Well-designed serious games can expand the frame of reference of participants (Inayatullah 2017) and help them see the broader context for planning, management, and policy. *IMPACT: Forestry Edition* helps players think systemically about interactions between different domains and how these domains could affect forestry in the future. The game can also help players understand the potential cascading impacts of change; that is, how one change can create various secondary impacts and beyond.

Effective games often support more effective collaboration and communication between stakeholders by bringing diverse groups together, fostering collaboration, and building empathy, which in turn can support more effective problem solving (Sánchez and Olivares 2011).

Social scientists can analyze the results of games played repeatedly by many players to explore the dynamics of social-ecological systems and to identify potential solutions to complex problems. For example, the Serious Games Initiative at the Woodrow Wilson International Center for Scholars developed an online game called Budget Hero in which players attempt to balance the federal budget (<http://www.wilsoncenter.org/budget-hero>). Budget Hero has generated a database of game runs from tens of thousands of players. Analysis of these runs can reveal policy preferences and innovative solutions in the face of real-world complexities and constraints.

Gaming approaches also have potential drawbacks. One downside is resistance to games and playful thinking in more traditional or “serious” organizations and among some individuals (Candy 2018). To counteract negative perceptions of games and gaming, Inayatullah (2017) recommends framing gaming in different ways to make it appeal to and engage different types of participants. Rejeski et al. (2015) agree and suggest using the term “playable models” instead of “games” to help avoid connotations of games and play as unimportant, frivolous, or juvenile.

Games are also difficult to design and the expertise to create them is scarce. Hiring a professional game designer may be difficult to afford or justify for most forestry organizations. Finally, Dator (2017) observed that games can sometimes be too powerful if participants

develop a strong attachment to the role they played or the outcome of a particular game session rather than understanding the broader results and lessons.

Conclusion

The growing use of gaming methods to address important objectives in many fields suggests the utility and effectiveness of these approaches. Games can engage and inform diverse stakeholders and generate insight in ways that other methods cannot. *IMPACT: Forestry Edition* facilitates a holistic view of forestry and natural resource management and helps players broaden their thinking about alternative forestry futures. This, in turn, may help achieve desired future conditions from the stand to society at large.

Supplementary Material

Supplementary material is available at *Journal of Forestry* online.

Supplement 1. A “print and play” pdf of the game.

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